

CASE REPORT

Nervous System Flexibility Following a Two-Day Shiftwave-Assisted Therapy Intensive in an Early Adolescent with Developmental Trauma and Emotional Dysregulation: A Case Report

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Abstract

Background

Developmental trauma in adopted children frequently presents with complex emotional dysregulation, attachment disruption, identity confusion, and limited access to conventional cognitive and behavioral interventions when dysregulated. Shiftwave is a proprietary technology designed to engage the autonomic nervous system through structured body-based protocols and is being clinically explored for applications related to stress, trauma, mental health, and nervous system regulation. This case report describes clinical observations from a structured two-day Shiftwave intensive in an early adolescent with a complex psychiatric and trauma history.

Case Presentation

P001 is a 12-year-old male with early childhood relational disruption who entered his family system at approximately two years of age. His documented diagnoses included Disruptive Mood Dysregulation Disorder (DMDD), Other Specified Disruptive/Impulse-Control/Conduct Disorder, and Posttraumatic Stress Disorder (PTSD). He had recently completed 15 months of residential treatment. He and his parents participated in a two-day intensive incorporating Shiftwave protocols alongside nervous system psychoeducation, family intervention, outdoor land-based activities, and structured clinical observation.

Outcomes

Key observations included: (1) absence of immediate post-intensive rebound dysregulation; (2) increased emotional accessibility without behavioral flooding; (3) self-directed interoceptive monitoring and protocol self-adjustment; (4) a spiritually and emotionally meaningful resonance with a belonging-themed protocol; (5) improved grounding and body awareness; (6) preserved and enhanced creativity; (7) increased ability within the family system to distinguish connected activation from threat-based activation; and (8) meaningful improvement in family co-regulation. Across the sessions with paired self-report data, mean anxiety fell from 33.6 to 8.1 and mean stress from 28.1 to 6.6 (0–100 scales), and self-reported valence improved in every paired session. Follow-up contacts in the first post-intensive week confirmed early stability across the transition home, initial generalization into family life, and preservation of key observed gains. During this period, P001 spontaneously told his mother that the chronic “fire” he had carried in his chest was gone. A later dysregulation episode occurred under significant attachment and family-system stress; importantly, the episode resolved without police involvement, physical restraint, or harm, and was followed by increased reflection and repair.

Conclusion

This case suggests that a structured Shiftwave-assisted therapy intensive, embedded within a broader therapeutic context, may support nervous system flexibility. These observations support the need for controlled, systematic investigation.

Keywords: Shiftwave, developmental trauma, emotional dysregulation, nervous system regulation, adolescent, attachment, PTSD, DMDD, case report

1. Background

Developmental trauma is not only remembered in the mind; it is often organized in the body. When early life includes relational disruption, abuse, neglect, or loss of consistent caregiving, the nervous system may learn that protection is more reliable than safety. Over time, this can shape how a child regulates emotion, responds to stress, experiences relationships, trusts adults, and understands themselves (van der Kolk, 2005). Children adopted from early adverse care environments often arrive with nervous systems that have had to adapt to instability, loss, neglect, institutional care, or disrupted attachment. Their difficulties may not fit neatly into one diagnostic category. Instead, they may show patterns of emotional dysregulation, impulsivity, anxiety, identity confusion, sensory sensitivity, and relational difficulty that reflect a body and brain organized around protection, connection-seeking, and survival (Purvis, Cross, Dansereau, & Parris, 2013).

Conventional cognitive and behavioral therapies are valuable and evidence-based for many people. At the same time, they can be difficult to access when a child's nervous system is organized around threat detection and protection. Insight, reflection, language, and behavioral flexibility all require some degree of regulation. When the body is in defense, the child may not have reliable access to the parts of the brain needed for learning, reasoning, and choice. This is why somatic, sensory, and body-based approaches are increasingly important: they can help the body begin to experience enough safety for cognitive and relational work to become possible (Porges, 2011; Arnsten, 2009).

Shiftwave offers one way of working with the body before asking the child to rely on insight, language, or behavioral control. For children whose nervous systems are organized around protection, cognitive and relational work may become more accessible only after the body has enough support to feel safer, more organized, and more present. Shiftwave is a proprietary chair-based platform designed to engage the autonomic nervous system through structured body-based protocols. In this case, Shiftwave was embedded within a broader therapeutic context that included nervous system psychoeducation, family work, outdoor activity, relational safety, agency, and structured clinical observation. Because clinical application with children who have complex developmental trauma is still emerging, this report is offered as cautious clinical observation rather than evidence of efficacy.

This report was prepared in accordance with the CARE Guidelines for case report development and documentation (Gagnier et al., 2013; Riley et al., 2017).

2. Patient Information

2.1 Demographic and Contextual Information

P001 is a 12-year-old male with early childhood relational disruption who entered his family system at approximately two years of age. Records and family description portray him as bright,

creative, socially interested, and relationally capable when his nervous system has enough support to feel safe and organized. Identifying information has been de-identified in accordance with ethical standards for case report preparation, and informed consent was obtained from the parents.

P001 and his parents traveled from out of state to participate in the two-day intensive, reflecting a significant family commitment to the process. The intensive was developed as part of an ongoing clinical collaboration between the treating clinician and the Shiftwave research and development team. The purpose was to observe, in a careful and structured way, how Shiftwave might support a child with a significant and well-documented mental health history when the technology was integrated with relational safety, family involvement, clinical observation, and opportunities for agency.

2.2 Chief Concerns and Presenting Context

At the time of the intensive, P001 had recently been discharged from 15 months of residential treatment following a period of severe family disruption that included multiple physical altercations with parents and law enforcement involvement. His parents reported substantial growth during residential care but carried ongoing concerns regarding emotional integration, self-regulation, transition to home, and identity development.

The clinical picture at presentation was one of a young person with high cognitive capacity but inconsistent regulatory access. His nervous system, as documented in pre-intensive medical records, showed a pattern of moving rapidly into control-seeking, argumentation, verbal intensity, and behavioral dysregulation when encountering limits, transitions, sensory overload, or perceived unfairness.

2.3 Medical and Psychiatric History

Current diagnoses at the time of the intensive were: Disruptive Mood Dysregulation Disorder (DMDD), Other Specified Disruptive/Impulse-Control/Conduct Disorder, and Posttraumatic Stress Disorder (PTSD). The residential treatment record additionally documented chronic anxiety, identity confusion, attachment-related insecurity, persistent feelings of not belonging, social difficulty, and food-related regulatory behavior.

Prior quantitative electroencephalography (QEEG) and Comprehensive Evaluation of Central Nervous System (CEC) assessment documented a consistent pattern across multiple evaluations, including elevated concern in attentional distractibility, executive functioning difficulty (sequencing, categorization, decision-making, task ordering), working memory strain, verbal impulsivity, sleep disruption, rumination and obsessive thinking, emotional reactivity and irritability, sensory filtering difficulty, and a possible dissociative or interoceptive feature characterized as feeling “spacey or out of my body.” Neurofeedback protocol recommendations identified primary Z-score sites at F8, F3, O2, and O1, with secondary sites including P4, T4, T3, and T6, suggesting dysregulation across frontal (inhibition, impulse control, self-monitoring), temporal (auditory-verbal processing, emotional memory), and occipital-parietal (sensory integration, grounding) networks. The quantitative parameters of this pre-intensive QEEG baseline are summarized in Section 5.

2.4 Developmental and Social History

P001 entered his family system at approximately two years of age, placing his early developmental disruption during the primary attachment formation period. Records describe a history of adoption-related identity confusion and persistent subjective experience of not

belonging, themes that had not been successfully resolved despite extensive prior therapeutic engagement. His father is employed as a first responder and presented with a chronically vigilant nervous system, reporting habitual sleep of approximately four hours per night. This family context is clinically relevant because the regulatory environment of the home includes a secondary nervous system organized around sustained vigilance and threat readiness.

3. Clinical Findings

3.1 Pre-Intensive Presentation

At the start of Day 1, P001 presented as guarded, cognitively engaged, and highly observant. He was not overtly oppositional; rather, he appeared to be studying the environment, the process, and the treating clinician before deciding how much of himself to make available.

One of the clearest early observations was the difference between his cognitive language and his emotional language. When he talked about areas of interest, such as technology, engineering, marine biology, and robotics, his language became fluid, detailed, and expansive. When the conversation moved toward emotional experience, his language became more sparse and effortful.

Clinically, this was understood less as resistance and more as protection. His thinking brain appeared highly available, while emotional and relational access seemed to require more safety. This pattern can be understood through a polyvagal lens: when the nervous system is scanning for safety, cognitive engagement may remain available while affective openness, social trust, and flexible relational connection remain more guarded (Porges, 2011).

3.2 Observational Findings During the Intensive

Clinical observations across both days were documented in real-time observer notes, self check-in forms, parent check-in forms, and structured clinical summaries. The following findings represent patterns observed across multiple time points.

Absence of Immediate Rebound Dysregulation

Based on P001's documented history, the clinician anticipated a rebound or "kickback" response following the first day, which included multiple Shiftwave sessions, extended therapeutic discussion, novel environments, emotional exposure, and family interaction. Parents described this pattern as predictable and persistent, typically manifesting as irritability, emotional flooding, behavioral escalation, or sleep disruption following any highly demanding experience.

Instead, parents reported a calm evening transition, no significant behavioral regression, smooth bedtime routine, rapid sleep onset, sustained sleep, and sleeping later than normal. The father specifically noted the absence of the expected kickback. This finding was independently corroborated by post-intensive follow-up four days later, during which the mother reported continued early stability despite the additional stressor of P001 beginning a new school with academic placement testing across his first three days.

A delayed dysregulation episode later occurred on June 24, 2026, in the context of attachment activation, family-system stress, and pressure related to future access to Shiftwave. This later episode is clinically important because it clarifies that the intensive did not eliminate dysregulation. Rather, the initial finding was the absence of immediate rebound following a highly demanding intervention, followed later by a dysregulation-and-recovery process that

resolved without police involvement, physical restraint, or harm. This distinction supports a more cautious interpretation: P001 was not suddenly free from dysregulation, but when dysregulation emerged, the family system appeared more able to move through it without the level of escalation, harm, or outside intervention that had characterized more severe historical patterns.

Self-Directed Interoceptive Regulation

One of the most clinically meaningful observations involved P001's use of the Shiftwave intensity control. Early in the intensive, he often began protocols at a higher level of stimulation and then gradually reduced the intensity over time, without instruction. As the intensive continued, however, a second pattern emerged: P001 began selecting lower starting intensities from the beginning of the protocol, rather than waiting until the input became too much.

Clinically, this felt significant. P001 was not simply reacting to stimulation after the fact. He appeared to be listening to his body earlier in the process and making more refined choices about the amount of input his nervous system could receive. This is especially meaningful given his documented history of difficulty recognizing internal states early enough to prevent escalation.

The Shiftwave experience appeared to provide a structured context in which interoceptive self-monitoring became more accessible. Within that context, P001 was able to notice, choose, adjust, and trust his own internal signals with increasing discernment.

Increased Emotional Access Without Flooding

On the morning of Day 2, P001 reported increased sadness, fear, and emotional heaviness. Rather than becoming dysregulated, he demonstrated insight and reflection. He spontaneously recognized that his upcoming transition out of residential care was beginning to feel emotionally real, having previously processed it only at a cognitive level. He verbalized this experience clearly, remained present, and did not become behaviorally disorganized. The clinical distinction between emotional access and emotional flooding is critical for this population. The observed shift was not suppression of affect but increased capacity for emotional tolerance and reality contact.

Meaningful Protocol Response: Belonging and Identity

The most emotionally significant Shiftwave experience occurred with the protocol "Breathe and Be." P001 selected this protocol himself after choosing to stop a different protocol, "Deep Love," which he identified as uncomfortable and connected to a trauma-related trigger. His ability to stop one experience, stay present, and continue exploring another was clinically meaningful. He did not escalate, withdraw, or need the clinician to regulate the moment for him. He noticed, chose, and stayed engaged.

During "Breathe and Be," P001 became visibly emotional. He later described the experience as spiritually meaningful, said he almost cried, and immediately wanted his parents to experience it as well. Both parents recognized the themes of the protocol — belonging, home, acceptance, presence, being enough, and humanness — as areas that have carried deep pain for him throughout his life.

His mother reflected that the protocol seemed to give him access to something he had struggled for years to put into words. Clinically, this appeared to be more than relaxation. It seemed to offer a body-based pathway into emotional recognition and validation. Rather than requiring him to explain the pain first, the protocol appeared to allow his body to feel something true enough that language, emotion, and connection became more available afterward.

Grounding and Body Awareness

Following multiple Shiftwave sessions, P001 described his body as feeling “heavy.” When invited to say more, he was clear that he did not mean sad, tired, or emotionally heavy. He described it more specifically as feeling like “gravity pushing.” Across the conversation, he was able to distinguish between physical heaviness, emotional heaviness, fatigue, and what appeared to be a more grounded body state.

This was clinically meaningful given his documented history of difficulty noticing and naming internal states. It was also notable in light of prior assessment language describing a dissociative quality of feeling “spacey” or “out of my body.” In this moment, P001 was not describing being away from his body. He appeared to be noticing himself more fully inside of it.

Preservation and Enhancement of Creativity

One question that often arises with regulation-focused work is whether helping a dysregulated child settle will make them less spontaneous, expressive, or creative. That was not observed with P001. Across both days, his imagination, curiosity, humor, and inventive thinking remained very much intact. If anything, they appeared to become more available.

He talked with sustained energy about robotics, game design, blacksmithing, ocean exploration, engineering, marine biology, and the possibility of building or creating new things. These were not superficial interests. They appeared to be places where he could feel competence, identity, and possibility.

As the intensive progressed, conversations that began with parent concern or clinical observation often shifted toward P001’s own ideas, questions, and future-oriented thinking. Clinically, this suggested that regulation was not reducing who he was. It appeared to be helping more of him come forward.

Connected Activation Versus Threatened Activation

An important distinction emerged during the intensive between activation that appeared connected and activation that appeared threat-based. These are not formal diagnostic terms, but they became useful clinical language for what was observed. Historically, increased energy in P001 had often been associated with escalation, agitation, impulsivity, conflict, or emotional flooding. Because of that history, the parents had understandable concern when his energy rose.

During the intensive, however, some of P001’s increased energy looked different. His body became more animated, but not more disorganized. His language became more expressive, creative, humorous, and future-oriented. His affect brightened, and his relational engagement increased. The energy felt familiar to the parents, but it did not appear to carry the same threat signal. Rather than suggesting that he was moving toward dysregulation, it appeared to reflect greater access to connection, expression, and self.

This distinction was clinically meaningful. If all activation is interpreted as dangerous, a child’s emerging aliveness can be mistaken for impending escalation. As the parents began to differentiate connected activation from threatened activation, they were able to remain calmer and more curious. This appeared to support P001’s ability to stay engaged, expressive, and regulated while experiencing a higher level of energy.

Family Co-Regulation

Significant co-regulatory shifts were observed within the family system during the intensive. One of the clearest moments occurred during a food-related interaction, when P001’s father

recognized that his response had come from an old reactive pattern rather than from who P001 was showing himself to be in the present. He offered P001 a direct, specific, and reflective apology. P001 received the apology calmly and without defensiveness.

This moment was clinically meaningful because the repair happened with very little conflict and without needing clinician facilitation. Given the family's documented history of chronic conflict and repeated escalation, this represented more than a positive conversation. It showed a shift in the family's capacity to pause, reflect, take responsibility, and return to connection.

Both parents also participated in Shiftwave sessions during the intensive. By Day 2, they were increasingly able to describe P001's behavior through a nervous system lens rather than a compliance lens. This reframing appeared to soften the relational field around him and create more room for curiosity, repair, and new responses from all three family members.

3.3 Quantitative Self-Report Findings

Before and after Shiftwave sessions, P001 completed brief state self-report ratings on four measures: a Visual Analog Scale for Anxiety (VAS-A, 0–100), a Stress Visual Analog Scale (Stress VAS, 0–100), the Self-Assessment Manikin valence scale (SAM, 1–5, where 1 is most positive and 5 is most negative), and the 10-item Positive and Negative Affect Schedule for Children (PANAS-C-10, with Positive and Negative subscales scored 5–25). On both anxiety and stress scales, lower post-session scores indicate improvement. Not every session included a completed pre-session form; those entries are shown with post-only values, and a dash (—) indicates data not recorded for that cell.

Table 1 presents anxiety, stress, and valence scores across all recorded sessions. Table 2 presents the corresponding PANAS-C-10 subscale scores.

Table 1. Pre/Post Anxiety, Stress, and Valence by Session

No.	Date	Time	Protocol	Pre Anxiety	Post Anxiety	Pre Stress	Post Stress	Pre SAM	Post SAM
1	6/12/26	9:30am	This Is Shiftwave	50	25	75	25	2	1
2	6/12/26	10:40am	Evolver	—	6	—	10	—	1
3	6/12/26	10:40am	Day at the Beach / SS Meditate	—	5	—	5	—	1
4	6/12/26	11:30am	SS Pure / SS Meditate	—	0	—	0	—	1
5	6/12/26	7:00pm	Breathe & Be	10.5	1.5	5	0	3	1
6	6/13/26	9:40am	Breathe & Be	75	10.2	26.7	6.7	3	2
7	6/13/26	10:38am	Sensorial	—	5.6	—	5.5	—	2
8	6/13/26	3:50pm	Emerald Wolf +	5.25	2.6	5.25	0	4	1

No	Date	Time	Protocol	Pre Anxiety	Post Anxiety	Pre Stress	Post Stress	Pre SAM	Post SAM
			Mastering the Present Moment						
9	6/13/26	5:13pm	Breathe & Be	27.3	1.16	28.5	1.16	3	1

Table 2. Pre/Post PANAS-C-10 Subscale Scores by Session

No.	Date	Time	Protocol	Pre PANAS+	Post PANAS+	Pre PANAS-	Post PANAS-
1	6/12/26	9:30am	This Is Shiftwave	14	19	9	7
2	6/12/26	10:40am	Evolver	—	20	—	6
3	6/12/26	10:40am	Day at the Beach / SS Meditate	—	20	—	9
4	6/12/26	11:30am	SS Pure / SS Meditate	—	20	—	6
5	6/12/26	7:00pm	Breathe & Be	25	10	9	8
6	6/13/26	9:40am	Breathe & Be	11	10	13	15
7	6/13/26	10:38am	Sensorial	—	15	—	15
8	6/13/26	3:50pm	Emerald Wolf + Mastering the Present Moment	15	15	13	15
9	6/13/26	5:13pm	Breathe & Be	20	20	14	9

Across the five sessions with paired pre- and post-session data, mean anxiety fell from 33.6 to 8.1, and mean stress fell from 28.1 to 6.6. Mean SAM valence moved from 3.0 to 1.2, with lower scores indicating a more positive state on this version of the scale. Mean PANAS Positive affect moved from 17.0 to 14.8, while mean PANAS Negative affect moved from 11.6 to 10.8. Every paired session showed a reduction in both anxiety and stress. The largest anxiety reduction occurred in the June 13 morning “Breathe and Be” session, when anxiety fell from 75 to 10.2, the highest pre-session anxiety recorded, in the context of P001 verbalizing grief about leaving residential care. The largest stress reduction occurred in the opening “This Is Shiftwave” session, when stress fell from 75 to 25. Self-reported valence improved in every paired session.

These self-report data are consistent with the qualitative observations described above and should be read alongside them, not in place of them. Several caveats apply. The PANAS-C-10 did not show a uniform positive shift. Mean Positive affect declined, driven mainly by Session 5, when PANAS Positive moved from 25 to 10. In context, this may reflect de-arousal as a high-energy child settles rather than worsening affect, but that interpretation remains tentative. The SAM is reported here as a valence scale and should not be read as an index of arousal. As detailed in the Discussion, these are subjective within-session state measures in a single

participant without a control condition, and are therefore susceptible to expectancy, demand characteristics, and regression to the mean, particularly where baseline distress was elevated. They are offered as descriptive, hypothesis-generating observations rather than as evidence of efficacy.

4. Timeline

Pre-intensive (prior to June 12, 2026): Completion of approximately 15 months of residential treatment. Discharge and significant family travel to the intensive site. Pre-intensive case summary prepared from medical records and neuropsychological data. Pre-intensive QEEG baseline obtained at Calo Neurotherapies on June 3, 2026 (see Section 5).

Day 1 – June 12, 2026 (morning): Initial clinical observation. Nervous system psychoeducation with P001 and both parents. Introduction to Shiftwave. Self-directed protocol exploration begins. Outdoor land-based activities. Parent coaching and co-regulation discussion. Shared meal in public setting.

Day 1 – June 12, 2026 (afternoon/evening): Continued Shiftwave sessions. Meaningful response to “Breathe and Be” protocol. Discussion of belonging, identity, and hope. Shared meal in public setting. Calm evening transition; rapid and sustained sleep; no rebound.

Day 2 – June 13, 2026 (morning): P001 reports increased sadness and fear. Emotional processing of residential treatment transition. Continued Shiftwave sessions. Emotional tolerance demonstrated without dysregulation. EEG baseline for father obtained. Shared meal in public setting.

Day 2 – June 13, 2026 (afternoon/evening): Food regulation reframing. Father-to-child repair conversation. Final Shiftwave sessions. Post-intensive single-channel EEG monitoring recordings obtained (see Section 7.6). Psychoeducation about rebound and recovery. Future planning conversations. Closure.

Post-intensive follow-up – June 17, 2026: Mother contacts clinician. Reports no immediate rebound across the first four post-intensive days, including start of new school and academic testing. P001 spontaneously reported that chronic “fire” in chest is gone. Mother reports whole-family-system change.

Post-intensive follow-up - June 20, 2026: Mother contacts clinician with videos from a family outing. Reports P001 chose to take waterskiing lessons for the first time after stating, “I think I can do it.” Mother observed anxiety cues during instruction, including quieting and scratching his head, but reframed them as nervous-system information rather than resistance. Parents advocated for clear, step-by-step instruction and processing time. P001 successfully got up on the skis. Mother described the moment as “incredible” after the previous year and a half. Themes include sustained courage, supported agency, parent attunement, and early generalization of intensive gains into real-life family experience.

Post-intensive follow-up – June 24, 2026: Mother contacts clinician reporting first significant dysregulation episode since discharge and completion of the intensive. Episode followed attachment-related activation from the previous evening, state-matching music use, and emotional pressure related to a scheduled church meeting about possible Shiftwave funding. P001 became highly dysregulated but remained closer to home than in more severe historical patterns. Episode resolved without police involvement, physical restraint, or harm. Family identified contributing triggers, including father-child rupture, music limits, autonomy concerns,

and attachment fear. P001 later verbalized more of what had been underneath the dysregulation, and the family moved toward reflection and repair.

5. Diagnostic Assessment

Formal diagnostic assessment was not the primary purpose of this intensive; diagnoses documented in the residential treatment discharge record were accepted as established. These included DMDD, Other Specified Disruptive/Impulse-Control/Conduct Disorder, and PTSD. The pre-intensive case summary provided a neurobiologically informed formulation, conceptualizing P001's presentation as reflecting a nervous system organized around threat management and control preservation rather than volitional defiance. QEEG/CEC findings showing disruption across frontal, temporal, and occipital-parietal networks were consistent with this formulation and with documented profiles of developmental trauma (van der Kolk, 2005).

Occupational therapy records documented sensory processing and interoceptive challenges, noting that P001 benefited from pre-warning strategies, adult curiosity about his sensory experience, rhythm and music as regulatory bridges, and challenge calibrated to his window of tolerance. These findings informed the intensive design.

Assessment tools used during the intensive included parent and client self-report forms before and after each Shiftwave session (summarized quantitatively in Section 3.3), real-time clinician observer notes, parent check-in forms, and a paternal EEG baseline. Cognitive testing (CNS Vital Signs) was attempted at the beginning of the intensive but discontinued when it became overwhelming to the client—an observation that was itself clinically informative.

Pre-Intensive QEEG Quantitative Baseline

A quantitative EEG (QEEG) assessment was conducted at Calo Neurotherapies on June 3, 2026, nine days before the Shiftwave intensive. EEG was recorded across the full 10–20 scalp array under both Eyes Closed (EC) and Eyes Open (EO) conditions and analyzed for magnitude, dominant frequency, interhemispheric connectivity, and interhemispheric asymmetry against normative and non-normative databases. The assessment was classified as exploratory data analysis and was not intended as a medical diagnosis. Global metrics are summarized in Table 3.

Table 3. Pre-Intensive QEEG Global Metrics (Calo Neurotherapies, June 3, 2026)

Metric	Eyes Closed	Eyes Open
Activation Ratio	1.79 (Normal–High)	2.27 (High)
Overall Dominant Frequency	Slow	Slow
Alpha Dominant Frequency	Slow	Slow
Beta Dominant Frequency	Fast	Fast
Hypo-Connectivity	22%	22%
Hyper-Connectivity	62% (Elevated)	56% (Elevated)
Alpha Asymmetry	0% (Normal)	38% — Left Dominant
Beta Asymmetry	25% — Left Dominant	69% — Right Dominant

Recommended neurofeedback protocols identified primary Z-score sites at O2 during eyes open and at T3, Fp1, O1, Fp2, T4, O2, P3, and P4 during eyes closed, with associated Disrupted Sleep, SMR, and Alpha-Theta protocols.

Taken together, the profile suggests a mixed-arousal, dysregulated state: slow-wave predominance and frontal slowing (features often associated with underarousal) co-occurring with elevated fast beta activity and right-dominant beta asymmetry during eyes open (features often associated with overarousal, hypervigilance, and difficulty adapting to novelty). During eyes open, alpha asymmetry was left-dominant, a pattern associated in the affective-neuroscience literature with withdrawal-related affect and reduced approach motivation (Davidson, 1998; Allen & Reznik, 2015). This pattern is clinically consistent with P001's documented developmental-trauma history but does not independently establish it. Single-session QEEG indices have limited established validity for individual diagnosis, and several of these metrics are state-sensitive and susceptible to artifact; the findings are therefore interpreted as convergent psychophysiological evidence for treatment planning rather than as a diagnostic determination (Nuwer, 1997; Coburn et al., 2006; Arns, Conners, & Kraemer, 2013).

6. Therapeutic Intervention

6.1 Overview of Intensive Design

The two-day intensive was designed not as isolated Shiftwave delivery but as a carefully paced regulatory intensive incorporating multiple modalities. Shiftwave served as a repeated anchor point between experiences of activation, curiosity, emotional processing, family interaction, and recovery. Non-Shiftwave components were considered essential context for interpreting P001's responses to the technology.

6.2 Shiftwave Protocols

Shiftwave is a proprietary chair-based platform designed to engage the autonomic nervous system through structured body-based protocols and user-controlled intensity settings. P001 engaged in multiple Shiftwave sessions across both days with full choice over protocol selection and intensity. Protocols explored included: This is Shiftwave (orientation), Evolver, Day at the Beach, SS Meditate 15, Deep Love (discontinued voluntarily due to discomfort), Breathe and Be (identified as most meaningful), and additional protocols selected through self-directed exploration. Both parents also participated in Shiftwave sessions.

6.3 Non-Shiftwave Intervention Components

The following activities were integrated into the intensive as part of the broader therapeutic context:

Opening nervous system psychoeducation with P001 and both parents (co-regulation, autonomic state, safety and behavior)

Outdoor land-based activity including tractor and mowing with father (competency, agency, body-based confidence)

Walking outdoors and observing nature and wildlife, followed by a parent walk the next day in which P001 successfully navigated back to the same location through winding streets

Shared meals in public settings (regulation, flexibility, food behavior, and family dynamics)

One-on-one therapeutic walk with clinician

Exploration of a Sisyphus meditation table with curiosity around design and mechanics

Structured conversations about creativity, technology, robotics, and future interests

Family conversations around food as safety, comfort, and nervous system regulation

Parent coaching on structure, snack access, consistency, and reducing shame

Direct parent-child repair conversation following food-related dysregulating interaction

Discussion of the emotional reality of leaving residential treatment

Exploration of belonging, home, identity, grief, and transition themes

Psychoeducation about rebound, delayed dysregulation, and nervous system recovery

Discussion of paternal nervous system pattern, sleep restriction, and off-duty transition difficulty

Future planning for competency-building activities (robotics, blacksmithing, martial arts, pottery, swimming)

7. Follow-Up and Outcomes

7.1 Immediate Post-Intensive Outcomes (Day 1 Evening)

Parents reported a calm evening transition, minimal irritability, smooth bedtime routine, rapid sleep onset, sustained sleep, and sleeping later than normal. The father specifically noted the absence of the anticipated rebound/kickback response, which both parents had reliably expected following emotionally demanding experiences.

7.2 Day 2 Clinical Outcomes

Day 2 began with increased emotional access, including sadness and fear connected to the reality of residential treatment transition. P001 demonstrated insight, verbal reflection, and emotional tolerance without behavioral dysregulation. This was understood as movement toward emotional reality contact rather than suppression. By the end of Day 2, P001 showed increased future orientation, self-directed exploration, and engagement with family conversation without the defensive rigidity historically expected.

7.3 Post-Intensive EEG Monitoring

Following completion of the final Shiftwave session on Day 2 (June 13, 2026), two single-channel EEG recordings were obtained from P001 in passive monitoring mode. Each file used a sequential montage: the electrode was moved across three placements, and eyes-open and eyes-closed data were recorded consecutively at each placement. This yielded twelve active site-condition segments across six placements.

These recordings are best understood as descriptive, state-dependent monitoring data. They were collected with single-channel portable hardware, with sites sampled one after another rather than at the same time. They also used a different system and montage than the pre-intensive 19-channel QEEG. For these reasons, the post-intensive data cannot be z-scored against normative databases and should not be treated as a direct pre/post QEEG comparison. They are included because they describe the distribution of EEG amplitude across frequency

bands, conditions, and electrode placements at the close of the intensive. Recording parameters are shown in Table 4, mean band amplitudes in Table 5, and derived ratios in Table 6.

Table 4. Post-Intensive EEG Recording Parameters

File	Full Time Range	Placements	Conditions	Active Segments
120400	18:00:08–18:08:38	Fz–A1, Cz–A1, Pz–A1	EO then EC at each placement	6
120402	18:13:16–18:21:22	C3–A1, C4–A2, C3–C4	EO then EC at each placement	6

Table 5. Mean EEG Amplitude by Site and Condition

File	Site	Condition	Active Seconds	Delta 1–4 Hz	Theta 4–8 Hz	Alpha 8–12 Hz	Low Beta 12–18 Hz	High Beta 22–36 Hz
120400	Fz–A1	EO	59	23.03	17.08	10.12	9.62	9.79
120400	Fz–A1	EC	64	23.72	18.01	14.18	10.82	7.31
120400	Cz–A1	EO	57	23.43	17.86	9.90	7.44	6.71
120400	Cz–A1	EC	62	21.32	18.98	15.62	11.78	8.66
120400	Pz–A1	EO	55	20.02	14.76	8.91	6.62	6.14
120400	Pz–A1	EC	59	20.52	21.17	20.87	13.49	8.70
120402	C3–A1	EO	59	22.56	19.54	11.80	7.35	5.71
120402	C3–A1	EC	62	17.01	18.79	14.46	9.95	5.96
120402	C4–A2	EO	59	21.59	16.99	10.47	7.06	6.23
120402	C4–A2	EC	57	16.67	15.50	12.11	8.95	6.27
120402	C3–C4	EO	58	9.86	9.92	5.91	5.48	4.78
120402	C3–C4	EC	59	10.18	9.72	7.72	6.97	4.94

Table 6. Derived Spectral Ratios

File	Site	Condition	Theta / Alpha	Delta / Alpha	Alpha / High Beta	Theta / High Beta
120400	Fz–A1	EO	1.69	2.28	1.03	1.75

File	Site	Condition	Theta / Alpha	Delta / Alpha	Alpha / High Beta	Theta / High Beta
120400	Fz–A1	EC	1.27	1.67	1.94	2.46
120400	Cz–A1	EO	1.80	2.37	1.48	2.66
120400	Cz–A1	EC	1.21	1.36	1.80	2.19
120400	Pz–A1	EO	1.66	2.25	1.45	2.40
120400	Pz–A1	EC	1.01	0.98	2.40	2.43
120402	C3–A1	EO	1.66	1.91	2.07	3.42
120402	C3–A1	EC	1.30	1.18	2.43	3.15
120402	C4–A2	EO	1.62	2.06	1.68	2.73
120402	C4–A2	EC	1.28	1.38	1.93	2.47
120402	C3–C4	EO	1.68	1.67	1.24	2.07
120402	C3–C4	EC	1.26	1.32	1.57	1.97

The post-intensive recordings showed a consistent slow-frequency emphasis across the unipolar placements. Delta and theta were generally higher than alpha during eyes-open segments, and alpha increased during eyes-closed segments at Fz, Cz, Pz, C3, C4, and C3-C4. That eyes-closed alpha increase is an expected state change and should not be read as an intervention effect. The highest alpha value was observed at Pz-A1 during eyes closed, where alpha was 20.87 μ V and nearly matched theta at 21.17 μ V. The bipolar C3-C4 derivation showed lower amplitudes across all bands than the ear-referenced central placements, which is consistent with the different derivation rather than necessarily with a different neurophysiological state.

High-beta amplitude remained lower than delta, theta, and alpha in every active segment. In the EEGer export, the 20 μ V threshold was exceeded most often in delta and theta ranges; high-beta rarely exceeded that threshold. This pattern is compatible with a calmer, lower-arousal end-of-day recording context. It should be interpreted carefully. The pre-intensive QEEG suggested elevated fast beta activity and asymmetry, while these post-intensive monitoring files showed relatively low high-beta amplitude and stronger slow-frequency activity. That difference is clinically interesting, but it is not a clean pre/post QEEG contrast. The systems, references, number of channels, timing, and recording conditions were different. Fatigue, eye condition, and the sequential montage may all have contributed (Santamaria & Chiappa, 1987; Ogilvie, 2001). The most defensible reading is that, at the close of the intensive, these portable monitoring data captured a state in which high-beta activity was not prominent and slower frequencies were more visible across the sampled placements.

7.4 Four-Day Post-Intensive Follow-Up (June 17, 2026)

In a telephone follow-up four days post-intensive, the mother reported:

No immediate rebound during the first four post-intensive days

Tolerance of the start of a new school, including academic placement testing across the first three school days, without dysregulation

P001 spontaneously told his parents that the chronic “fire” he had carried in his chest for as long as he could remember was gone

The mother described the family system as changed through the experience, extending beyond P001 to include both parents

7.5 Post-Intensive Follow-Up: Early Generalization Into Family Life (June 20, 2026)

On June 20, 2026, P001’s mother contacted the clinician with videos and text updates from a family outing. She reported that P001 had chosen to take waterskiing lessons for the first time. Prior to the activity, his parents checked in with him more than once about whether he wanted to participate. P001 reportedly stated, “I think I can do it.”

During instruction, mother observed visible anxiety cues, including quieting and scratching his head. Rather than interpreting these behaviors as resistance, avoidance, or opposition, she recognized them as nervous-system information. She also advocated for his learning needs by communicating to the instructor that P001 benefits from clear, step-by-step instructions and time to process.

P001 remained engaged and proceeded with the activity. Mother later reported that he successfully got up on the skis. She described the moment as “incredible,” particularly in light of the previous year and a half of difficulty, separation, treatment, and family uncertainty.

Clinically, this follow-up was meaningful because it suggested early generalization of gains observed during the intensive. P001 was not simply regulated within the clinical setting or within the Shiftwave chair. He appeared to be carrying increased willingness, courage, and agency into a novel, community-based family experience.

This moment was also significant for the family system. The parents did not push him without consent, nor did they interpret anxiety cues as failure. They asked, watched, supported, advocated, and allowed him to step in with fear still present. The outcome was not the absence of anxiety; the outcome was that P001 experienced anxiety and still moved toward something new.

Primary themes observed in this follow-up included sustained courage, supported agency, parent attunement, nervous-system-informed parenting, and early evidence that the intensive experience may have supported real-life behavioral and relational generalization.

7.6 Delayed Post-Intensive Rebound and Recovery (June 24, 2026)

On June 24, 2026, P001’s mother contacted the clinician reporting the first significant dysregulation episode since discharge and completion of the intensive. This episode occurred in the context of several converging stressors. The previous evening, P001 appeared to experience an attachment-related rupture with his father during cleanup after a family card game. Rather than verbally addressing the hurt directly, P001 later used music that matched his dysregulated state and seemed to provide short-term emotional relief without fully resolving the underlying activation. He woke the next morning dysregulated. The same day, P001 and his mother were also scheduled to meet with their church regarding possible financial support for obtaining a Shiftwave for home use, adding additional emotional pressure and meaning to the day. No additional Shiftwave sessions were available to P001 after the intensive ended on June 13, 2026.

During the episode, P001 became highly dysregulated. His mother described behaviors that included leaving the immediate interaction, going to the family vehicle, locking his mother out of

the house, verbal aggression, and a concerning movement toward medication access. These behaviors required active parent response and safety attention. At the same time, several clinically important differences were noted when compared with historical patterns. His mother reported that historically he likely would have left more quickly and moved farther from the home, including toward a nearby roadway. In this episode, although he left the immediate space, he remained closer, including spending time in the family vehicle. The police were not called. No one was harmed. The episode did not result in physical restraint.

The mother was able to remain more oriented to a nervous-system interpretation of the behavior, even while also recognizing moments where her own fear shaped her response. She later reflected with P001 that her initial reaction came from fear when she could not locate him, and she connected that experience to how fear can also drive his behavior. P001 eventually became more able to verbalize some of what had been underneath the dysregulation, including the previous night's interaction with his father, his frustration about music limits, and his feeling of being treated as younger than he is. His father also acknowledged his own contribution to the previous night's rupture and apologized.

A notable regulatory bridge during the episode involved P001's service animal. Although P001 could not initially take in verbal reassurance or expressions of love from his mother, he remained connected to his service animal's safety and well-being. This appeared to provide an access point for care, concern, and relational connection when direct attachment language was too difficult to receive.

Clinically, this episode is important because it demonstrates that the intensive did not eliminate dysregulation. Rather, it may have shifted what became possible inside and around dysregulation. A delayed rebound did occur, and it occurred under circumstances that would reasonably be expected to activate attachment threat, shame, autonomy concerns, and pressure related to future access to Shiftwave. However, the outcome differed from more severe historical patterns. P001 eventually moved toward regulation without police involvement, without physical restraint, and without harm to himself or others. The family was also able to identify contributing triggers, reflect on parent responses, name the attachment rupture, and continue repair.

This follow-up adds nuance to the earlier observations. The absence of immediate rebound dysregulation following the intensive, the continued stability across the first several days of school and academic testing, P001's spontaneous report that the chronic "fire" in his chest was gone, and the later June 24 dysregulation-and-recovery episode are clinically meaningful when considered together. The later rebound episode is especially important because it prevents overinterpretation of the early gains; P001 did become dysregulated, but the family system was able to move through the episode without police involvement, physical restraint, or harm, and with increased capacity for reflection and repair afterward. The episode supports the importance of longer-term follow-up and reinforces that the clinically relevant question is not whether dysregulation disappears, but whether the child and family system can recover differently when dysregulation occurs.

These observations are preliminary and are offered as clinical data points requiring longer-term follow-up. Single-case post-intensive reports carry significant limitations addressed in the Discussion.

8. Patient and Family Perspective

P001's expressed perspective, gathered through observation, direct conversation, and parent report, reflected several consistent themes. He described the "Breathe and Be" protocol as touching him on a "spiritual level" and immediately wanted his parents to experience it as well. This appeared clinically significant. P001 did not only have an internal response to the protocol; he wanted his parents to have access to something he had felt but had not been able to fully explain.

When both parents later experienced "Breathe and Be" themselves, it appeared to give them a new window into P001's internal world. The themes of belonging, home, acceptance, presence, being enough, and humanness were not abstract concepts for this family. They were directly connected to wounds P001 had carried for years and to experiences the family had struggled to reach together through conversation alone. In this way, the protocol seemed to create a shared felt language for something that had previously been difficult for P001 to articulate and difficult for his parents to fully access.

P001 also verbalized, without prompting, the emerging emotional reality of leaving residential care. He described grounded heaviness as distinct from sadness or fatigue. In post-intensive follow-up, he reportedly described the absence of the chronic anger and tension in his chest that had been a persistent internal experience.

Mother's perspective emphasized P001's notably increased energy following the intensive, which she experienced as freedom of expression rather than preparatory dysregulation. She also reported increased creativity, vocal engagement, continued desire for further Shiftwave use, and change at the level of the family system.

Following the later June 24 dysregulation episode, mother's perspective also reflected increased ability to interpret P001's behavior through a nervous-system and attachment lens, while recognizing both the seriousness of the episode and the ways the family moved through it differently than in more severe historical patterns.

Father's perspective included recognition of his own reactive pattern and willingness to offer a direct and specific apology, which P001 accepted calmly. He also engaged personally with Shiftwave and responded meaningfully, which was clinically relevant given his self-described difficulty with sleep and transitioning off duty. Taken together, the parents' participation suggested that Shiftwave may have supported P001's regulation while also helping the family access one another differently.

9. Discussion

This case presents several clinically meaningful observations that may inform the clinical exploration of Shiftwave with adolescents presenting with complex trauma, emotional dysregulation, and attachment-related difficulty. While this is a single-case report and the findings must be interpreted cautiously, the observations are important because they suggest that a structured Shiftwave intensive, when held within a broader therapeutic context, may support more than short-term calming.

The most theoretically significant observation is that the primary outcome was not relaxation, but nervous system flexibility. P001 demonstrated the ability to become emotional without collapse, experience discomfort without withdrawal, receive repair without defensiveness, engage deeply without producing immediate rebound, and move into increased energy without becoming behaviorally disorganized. This distinction matters. The goal was not to quiet him, reduce him, or make him compliant. The more meaningful question was whether his nervous

system could become more available: to his body, to his emotions, to his parents, to choice, and to a different experience of himself. This pattern is consistent with polyvagal theory's emphasis on autonomic flexibility as a functional target of regulation-focused intervention, distinguishing it from simple calming or inhibition (Porges, 2011).

The self-directed protocol engagement warrants particular attention. Children with developmental trauma frequently demonstrate impaired interoception and difficulty recognizing early signals of dysregulation (van der Kolk, 2005; Siegel, 2012). In this case, the Shiftwave interface appeared to provide a structured, body-based context within which interoceptive self-monitoring became more accessible. P001 repeatedly adjusted the intensity without instruction. Early in the intensive, he often began protocols at higher levels of stimulation and then reduced intensity over time. As the intensive continued, he began choosing lower starting intensities from the beginning. This suggested more than a preference for comfort. He appeared to be listening earlier, making more refined choices, and adjusting external input in response to what his body could receive. This suggests a potential mechanism by which Shiftwave may support not only regulation, but the development of regulatory self-awareness.

The meaningful response to "Breathe and Be" is also clinically significant. P001 selected this protocol after independently stopping another protocol that felt uncomfortable and connected to a trauma-related trigger. His ability to stop one experience, remain present, and continue exploring another was itself meaningful. He did not escalate, withdraw, or require the clinician to regulate the moment for him. He noticed, chose, and stayed engaged.

During "Breathe and Be," P001 became visibly emotional, later described the experience as touching him on a spiritual level, and immediately wanted his parents to experience it as well. This response is consistent with theoretical accounts suggesting that body-based sensory experience may access affective material that verbal and cognitive approaches cannot reliably reach in dysregulated populations (Levine, 2010; van der Kolk, 2014). The themes of belonging, home, acceptance, presence, being enough, and humanness that resonated for P001 were precisely those documented in his developmental history as longstanding unresolved areas. That these themes became accessible through a structured body-based experience may reflect a meaningful advantage of somatic approaches for clients with attachment disruption and developmental trauma.

It was also significant that both parents experienced "Breathe and Be" themselves. This appeared to create a shared family access point. These themes had been discussed before, but discussion alone had not allowed the family to fully reach them together. The protocol seemed to offer a felt language for something P001 had struggled to explain and his parents had struggled to fully access. In this way, the experience was not only individual; it became relational. It gave the parents a possible window into their son's internal state in a way that had previously not been available to any of them.

Another important observation was the distinction between emotional access and emotional flooding. On the morning of Day 2, P001 reported increased sadness, fear, and emotional heaviness related to the emerging reality of leaving residential treatment and returning home. He did not become behaviorally disorganized. He remained present, reflective, and able to speak about what was happening. This suggests that the observed shift was not suppression of affect. Rather, it may have reflected increased capacity for emotional tolerance and reality contact. For children with complex developmental trauma, this distinction is clinically important. Emotional material becoming available is only useful if the nervous system can remain organized enough to stay with it.

The observation of grounded heaviness also warrants attention. Following multiple Shiftwave sessions, P001 described feeling “heavy,” but differentiated this from sadness, fatigue, or emotional heaviness. He described it more specifically as feeling like “gravity pushing.” Given prior assessment language describing a dissociative quality of feeling “spacey” or “out of my body,” this distinction is meaningful. In that moment, P001 was not describing being away from his body. He appeared to be noticing himself more fully inside of it. This may represent a clinically relevant shift in interoceptive access and embodied awareness.

This case also raises an important clinical distinction between connected activation and threatened activation. These are not formal diagnostic terms, but they became useful descriptive language during the intensive. Historically, increased energy in P001 had often been associated with escalation, agitation, impulsivity, conflict, or emotional flooding. Because of that history, it was understandable that his parents had learned to become alert when his energy rose.

During the intensive, however, some of P001’s increased energy looked different. His body became more animated, but not more disorganized. His language became more expressive, creative, humorous, and future-oriented. His affect brightened, and his relational engagement increased. The energy felt familiar to the parents, but it did not appear to carry the same threat signal. Rather than suggesting that he was moving toward dysregulation, it appeared to reflect greater access to connection, expression, and self. This distinction matters because if all activation is interpreted as dangerous, a child’s emerging aliveness can be mistaken for impending escalation. As the parents began to differentiate connected activation from threatened activation, they were able to remain calmer and more curious. This appeared to support P001’s ability to stay engaged, expressive, and regulated while experiencing a higher level of energy.

The family-system observations are also central to this case. P001 was not the only nervous system participating in the intensive. Both parents engaged in Shiftwave sessions, received nervous system psychoeducation, and began to reframe behavior through a regulation lens rather than a compliance lens. The father’s direct and specific apology following recognition of his own reactive pattern was particularly meaningful. P001 accepted the apology calmly and without defensiveness. Given the family’s documented history of chronic conflict and repeated escalation, this repair interaction represented more than a positive conversation. It showed the family’s emerging capacity to pause, reflect, take responsibility, and return to connection.

The quantitative self-report data (Section 3.3) are broadly consistent with these qualitative observations. Every session with paired data showed reductions in both anxiety and stress, and self-reported valence improved in every paired session. These reductions should not be over-read: they are within-session, subjective state ratings in a single participant without a control condition, and the PANAS-C-10 did not show a uniform positive shift. They are best understood as corroborating the observational picture rather than as independent evidence of effect. Similarly, the EEG data should be read with restraint. The pre-intensive QEEG described a mixed-arousal, fast-beta-elevated profile using a 19-channel assessment system. The post-intensive monitoring files, collected later with a single-channel sequential montage, showed relatively low high-beta amplitude and more visible slow-frequency activity across the sampled placements. That contrast is clinically interesting, but it is not a clean pre/post EEG comparison. Fatigue, eyes condition, electrode reference, sequential sampling, and device differences all limit interpretation. The post-intensive EEG findings are therefore reported as descriptive and hypothesis-generating.

The post-intensive follow-up adds an important layer to the case. The absence of immediate rebound dysregulation following the intensive, the continued early stability across the first

several days of school and academic testing, P001's spontaneous report that the chronic "fire" in his chest was gone, the June 20 waterskiing experience, and the later June 24 dysregulation-and-recovery episode are clinically meaningful when considered together. These observations suggest that the intensive may have supported change beyond the immediate treatment environment, though longer follow-up is needed.

The June 20 follow-up was especially relevant because it suggested early generalization into real-life family experience. P001 chose to take waterskiing lessons for the first time after stating, "I think I can do it." His mother observed visible anxiety cues during instruction, including quieting and scratching his head, but interpreted these as nervous-system information rather than resistance. His parents advocated for clear, step-by-step instruction and processing time. P001 successfully got up on the skis. Clinically, the most important part of this observation is not that anxiety was absent. It was that anxiety was present, and he still stepped in. This reflects supported agency, courage, parent attunement, and early behavioral generalization outside the clinical setting.

The June 24 follow-up added a different and important layer to the clinical picture. A delayed dysregulation episode occurred in the context of attachment activation, family-system stress, state-matching music use, and pressure related to a scheduled meeting about possible Shiftwave funding. This episode clarified that the intensive did not eliminate P001's vulnerability to dysregulation. However, the episode resolved without police involvement, physical restraint, or harm. The family was later able to identify contributing triggers, including the father-child rupture from the previous evening, music limits, autonomy concerns, and attachment fear. P001 also became more able to verbalize what had been underneath the dysregulation, and the family moved toward reflection and repair. This follow-up may be one of the most clinically credible data points in the case because it shifts the question from whether dysregulation disappeared to whether P001 and the family system could move through dysregulation differently when it emerged.

This case also raises an important clinical consideration regarding post-intensive continuity of support. No additional Shiftwave sessions were available to P001 after the intensive ended on June 13, 2026. Based on the observations in this case, the treating clinician's current view is that access to Shiftwave following an intensive may be clinically important for helping the nervous system continue practicing regulation after the highly supported treatment window has ended. At this stage, weekly Shiftwave use for at least six months appears to be a reasonable minimum recommendation when clinically appropriate and available, with more frequent use likely preferable for individuals with complex developmental trauma, high autonomic activation, or significant family-system stress. This recommendation should be understood as a clinical hypothesis emerging from the case rather than an established dosing standard. Future research should examine the frequency, duration, and continuity of post-intensive Shiftwave use needed to support maintenance, consolidation, and generalization of observed gains.

Several important limitations must be acknowledged. This is a single-case observational report without control conditions, standardized pre- and post-measures, or blinding. The intensive embedded Shiftwave within a broader therapeutic environment that included nervous system psychoeducation, family work, outdoor activity, parent coaching, relational repair, and other non-Shiftwave components. As a result, attribution of specific effects to Shiftwave alone is not possible. The clinician served simultaneously as treating clinician and primary observer, introducing potential for confirmation bias. Parent reports, while clinically meaningful, are subjective and occurred in the context of strong hope, emotional investment, and family transition. The self-report and EEG data share these limitations: the self-report measures are subjective and susceptible to expectancy and regression to the mean, and the EEG data are

constrained by single-channel acquisition, end-of-day timing, and non-comparability between the pre- and post-intensive systems. The follow-up period is brief. The client's simultaneous transition from residential care to home represents a major confounding contextual variable.

Despite these limitations, the case contributes clinically meaningful observational data to an area with limited published evidence. The specificity and consistency of observations across multiple sources — treating clinician observation, parent reports, observer documentation, structured summaries, quantitative self-report ratings, pre- and post-intensive EEG data, and a well-documented pre-intensive baseline from 15 months of residential treatment records — provides a degree of clinical triangulation that increases the descriptive value of the report. The consistency of the observations is particularly notable given that the family strongly expected rebound dysregulation following a highly demanding experience, that immediate rebound did not occur, and that the later delayed dysregulation episode resolved without police involvement, physical restraint, or harm.

This case does not establish efficacy. It does, however, suggest several directions worthy of further study. Future research should include systematic pre- and post-assessment using standardized measures of emotional dysregulation, interoceptive awareness, sleep, parent stress, and family functioning. Longitudinal follow-up is especially important. Attainment and sustainability are different clinical questions. A child may access regulation, courage, emotional openness, or relational repair in a highly supported setting, but the more important question is whether those capacities can be sustained, strengthened, and generalized across ordinary life.

Future research directions suggested by this case include: (1) systematic pre- and post-assessment using standardized measures of emotional dysregulation and interoceptive awareness; (2) longitudinal follow-up at six months and one year to evaluate persistence of observed gains; (3) investigation of specific Shiftwave protocol characteristics associated with therapeutic response; (4) examination of family-system effects when multiple family members participate; (5) attention to high-vigilance secondary nervous system presentations within the family context; (6) evaluation of the frequency, duration, and continuity of post-intensive Shiftwave use needed to support maintenance and generalization; and (7) evaluation of whether body-based regulation tools may support shifts in emotional tolerance, relational repair, belonging, agency, and real-life generalization.

In summary, this case suggests that a structured Shiftwave intensive, when integrated within a trauma-informed, relational, and clinically attuned therapeutic context, may support more than short-term calming. In P001, the observed shifts involved autonomic flexibility, interoceptive awareness, emotional access without flooding, preserved creativity, family repair, early generalization into real-life experience, and a later dysregulation-and-recovery episode that resolved without prior-level escalation. The findings are preliminary and require systematic investigation. Still, the case points toward an important clinical question: not simply whether the body can be helped to settle, but whether a structured body-based intervention may help the nervous system access, practice, and carry forward greater autonomic flexibility, trust, and connection in ordinary life.

10. Ethical Considerations and Informed Consent

Written informed consent for case report preparation and publication was obtained from the parents. The client was informed at an age-appropriate level and expressed willingness to participate. The case identifier P001 is used in place of the client's full name. Identifying information has been removed or generalized to reduce the likelihood of client or family

identification. The treating clinician maintained compliance with applicable privacy laws and professional ethical standards throughout the intensive and documentation process.

The intensive was conducted within the context of an ongoing clinical relationship and research collaboration. The treating clinician disclosed her affiliation with the Shiftwave research and development collaboration at the outset of the intensive. The family participated voluntarily and was not compensated.

11. Appendix: EEG Data Sources and Analysis Methods

11.1 Pre-Intensive QEEG Source

The pre-intensive QEEG information summarized in Section 5 came from the clinical report provided by Calo Neurotherapies. That report was completed before the Shiftwave intensive and described a 19-channel EEG assessment using the full 10-20 scalp array under eyes-closed and eyes-open conditions. The Calo report included interpretive outputs for magnitude, dominant frequency, connectivity, asymmetry, activation ratio, and recommended neurofeedback protocol sites.

For this case report, the Calo findings were not reprocessed from raw EEG. They were abstracted from the clinical QEEG report and presented as part of the pre-intensive diagnostic and treatment-planning context. The language in Section 5 therefore treats those findings as a prior clinical assessment rather than as a new analysis performed for this case report.

11.2 Post-Intensive EEGer Export Source

The post-intensive EEG monitoring data summarized in Section 7.6 were reanalyzed from the EEGer exports located in the Post Intensive folder. Two files were used: Post Intensive 120400E.csv and Post Intensive 120402E.csv. The corresponding EDF files were retained as source files, but the table values in this report were recomputed from the one-second CSV exports because those files contained the channel-label field, period markers, band-amplitude fields, thresholds, and EEGer percent-over-threshold outputs.

File 120400 was recorded from 18:00:08 to 18:08:38 and sampled Fz-A1, Cz-A1, and Pz-A1. File 120402 was recorded from 18:13:16 to 18:21:22 and sampled C3-A1, C4-A2, and C3-C4. In each file, the electrode was moved sequentially across three placements. At each placement, eyes-open data were recorded first and eyes-closed data were recorded second. The EEGer export did not populate the Eyes column, so condition was assigned from the active period sequence: periods 1, 3, and 5 were treated as eyes open; periods 2, 4, and 6 were treated as eyes closed. Rows marked as period 0 were treated as setup, transition, or between-condition rows and were excluded from the analytic summaries.

11.3 Post-Intensive Summary Calculations

For each active site-condition segment, mean amplitude was recomputed from the one-second EEGer amplitude columns for the standard frequency bands used in the report: delta 1-4 Hz, theta 4-8 Hz, alpha 8-12 Hz, low beta 12-18 Hz, and high beta 22-36 Hz. The active seconds reported in Table 5 represent the number of non-transition rows included for that site and condition. Spectral ratios in Table 6 were computed from those segment-level mean amplitudes.

The post-intensive data were not z-scored and were not compared statistically with the Calo QEEG. That decision was intentional. The post-intensive files were single-channel, sequential, portable monitoring recordings obtained at the end of a demanding clinical day. The pre-

intensive QEEG was a separate 19-channel clinical assessment performed on a different system, with a different montage and purpose. For that reason, the post-intensive analysis was limited to descriptive within-file summaries: relative band amplitude, eyes-open versus eyes-closed state differences, site-level patterns, and cautious comparison with the pre-intensive clinical profile only at the level of general convergence or contrast.

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CARE Checklist Compliance Note

This case report was prepared in accordance with the CARE 2013 checklist and the Riley et al. (2017) explanation and elaboration document. Items addressed include: title (case report identified); abstract (background, case presentation, outcomes, conclusion); introduction (scientific background and rationale); patient information (de-identified demographic and contextual information); clinical findings (behavioral, neuropsychological, interoceptive, and quantitative self-report findings); timeline (chronological summary of key events); diagnostic assessment (formulation, assessment methods, and quantitative QEEG baseline); therapeutic intervention (description, administration, and sequence); follow-up and outcomes (clinician- and patient/family-reported outcomes and post-intensive EEG monitoring); discussion (strengths, limitations, clinical and scientific implications); patient/family perspective; ethical considerations and informed consent; and an appendix documenting EEG data sources and analysis methods. The CARE checklist is available at: www.care-statement.org

Prepared in accordance with the CARE Guidelines for case report publication. De-identified clinical material.