HELPING HANDS THERAPY RESOURCES · REGULATION-FIRST™

CLINICAL RESOURCE — THERAPIST GUIDE

Sound & the Nervous System — *A Clinical Guide to Frequency, Entrainment & Therapeutic Listening*

From binaural beats to sound baths to SSP and iLs — the neuroscience of sound as a regulation tool, and how to use it clinically.

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THE FOUNDATION

Sound Is Not Background — It Is Input

The auditory system has a direct anatomical connection to the vagus nerve and the autonomic nervous system. Unlike most sensory inputs, sound bypasses the cortex and reaches the brainstem — the seat of NS regulation — almost immediately. This is why music can shift emotional state before we've had time to think about it. It is also why sound is one of the most powerful and most underused tools in regulation-focused clinical practice.

THE REGULATION-FIRST™ CLINICAL PRINCIPLE

"The ear is not just a hearing organ. It is a regulation organ. The middle ear muscles connect directly to the vagus nerve — meaning what a child listens to is shaping their NS state in real time, every session."

This is the physiological basis for the Safe and Sound Protocol, the Integrated Listening System, and therapeutic listening programs broadly.

PART 1 — BRAINWAVE STATES

Five States, Five Clinical Opportunities

The brain's electrical activity organizes into frequency bands — each associated with a distinct functional and regulatory state

WAVE	FREQUENCY	STATE	CLINICAL RELEVANCE	SOUND TARGET
Delta	0.5–4 Hz	Deep sleep, unconscious repair, growth hormone release	Children with sleep dysregulation, trauma, chronic hyperarousal rarely access this state adequately	0.5–4 Hz binaural beats; slow drumming; low-frequency sound baths
Theta	4–8 Hz	Meditation, emotional processing, memory consolidation, hypnagogic state	Trauma processing, creative work, insight — often where breakthroughs in therapy occur. Children in dysregulation rarely access theta.	4–7 Hz binaural beats; gong baths; singing bowls tuned to low frequencies
Alpha	8–13 Hz	Calm alertness, relaxed focus, the bridge between conscious and unconscious	The target state for learning and therapy — regulated but engaged. Most dysregulated children spend insufficient time here.	8–12 Hz binaural beats; nature sounds; Therapeutic Listening music; SSP
Beta	13–30 Hz	Active thinking, concentration, alertness — and at high end: anxiety, rumination	Most dysregulated children and anxious adults are chronically in high-beta. The clinical goal is usually to reduce, not increase, beta activity.	Avoid high-frequency binaural beats for anxious clients. Use alpha-targeted sound instead.

WAVE	FREQUENCY	STATE	CLINICAL RELEVANCE	SOUND TARGET
Gamma	30–100 Hz	Peak cognitive processing, cross-brain integration, information binding	Associated with experienced meditators and high-level cognitive function. Emerging research in autism. Not a primary clinical target for most pediatric regulation work.	25–40 Hz binaural beats; specific frequency protocols in research settings

PART 2 — BINAURAL BEATS

Frequency-Specific Entrainment — Clinical Application

Binaural beats require headphones — each ear receives a slightly different frequency, and the brain perceives the mathematical difference as a third "beat" that entrains its own electrical activity

THE CLINICAL MECHANISM

When the left ear receives 200 Hz and the right ear receives 210 Hz, the brain perceives a 10 Hz beat — in the alpha range. This perceived beat drives a frequency-following response in which the brain's electrical activity shifts toward that frequency. This is brainwave entrainment: the brain synchronizing with an external auditory stimulus.

Important clinical note: Binaural beats require headphones and should not be used with clients who have seizure disorders without physician clearance. They are generally contraindicated in active psychosis.

DELTA RANGE

0.5 – 4 Hz

Deep sleep · Repair · Recovery

Clinical uses

Sleep initiation and maintenance · Post-trauma recovery support · Chronic hyperarousal and cortisol dysregulation · Pain management protocols

Protocol: 20–30 min at bedtime. Layer under sleep hygiene routine. Not appropriate for daytime use — will cause drowsiness.

THETA RANGE

4 – 8 Hz

Meditation · Insight · Emotional processing

Clinical uses

Pre-session calm for trauma-informed work · Creative visualization · Anxiety reduction · Memory consolidation post-session · Deep relaxation protocols

Protocol: 10–20 min pre-session or during guided relaxation. May cause drowsiness in some clients. Monitor arousal level.

ALPHA RANGE

8 – 12 Hz

Calm focus · Flow state · Regulated alertness

Clinical uses

Optimal learning and therapy state · Anxiety reduction without sedation · Attention support · Pre-session regulation · The most broadly applicable clinical target

Protocol: 10–20 min before or during session activities. 10 Hz is the most commonly studied alpha frequency. Best entry point for most clients.

LOW BETA / SMR

12 – 15 Hz

Calm alertness · Motor control · Attention

Clinical uses

Attention and focus without anxiety · Sensorimotor rhythm (SMR) protocols for ADHD · Alerting without overstimulation · Post-relaxation re-engagement

Protocol: 15–30 min during structured cognitive or motor tasks. More activating than alpha — not appropriate for anxious or highly reactive clients.

HIGH BETA

16 – 30 Hz

Alert · Active · Cognitive demand

Clinical uses — use with caution

Energy and motivation for low-arousal / depressive states · Brief alerting before demanding tasks · Not recommended for anxious, sensory-sensitive, or highly reactive clients

Protocol: Brief (5–10 min), used intentionally. High-beta binaural beats can increase anxiety and reactivity in dysregulated nervous systems. Use alpha first.

GAMMA — EMERGING RESEARCH

25 – 40 Hz

Cognitive integration · Cross-brain binding

Emerging clinical interest

40 Hz gamma entrainment is under active investigation for Alzheimer's, autism, and cognitive enhancement. 2024 research shows promise for cross-brain integration. Not yet a standard clinical protocol.

Note: Follow emerging research in this space — this is likely to be a significant area of development in the next 5–10 years of therapeutic sound work.

PART 3 — SOUND BATHS

Resonance, Vibration & the Vagus Nerve

Sound baths use sustained tones from instruments tuned to specific frequencies — singing bowls, gongs, tuning forks, chimes, and drums — to create an immersive vibrational environment. Unlike binaural beats, sound baths work through physical vibration as well as auditory entrainment: the body literally resonates with the frequency. This vibrational component creates direct mechanical stimulation of the vagus nerve through the chest cavity.

Sound baths are effective with children who cannot tolerate headphones, who are non-speaking, or who have significant tactile or auditory sensitivities — because the therapeutic input can be received through vibration rather than careful listening.

Singing Bowls

Crystal and Tibetan bowls produce rich harmonic overtones. Placed near the body, vibration is felt as well as heard. 432 Hz and 528 Hz are commonly used in therapeutic contexts.

Gongs

Large gongs produce complex, low-frequency sound fields that physically move through the chest cavity. Highly effective for deep nervous system reset — particularly for shutdown/ freeze states.

Tuning Forks

Clinically precise frequency delivery. Can be applied to the body at acupressure points. 128 Hz (low C) is used for grounding; 256 Hz and 512 Hz for craniosacral and nervous system work.

Drums & Rhythm

Slow, rhythmic drumming at 4–7 beats per second entrains theta brainwaves. Shamanic drumming has been used for altered-state work for thousands of years — now validated neurologically.

Chimes & Bells

High-frequency, brief tones — particularly useful for alerting from freeze states, signaling transitions, and providing auditory anchors during regulation work.

Voice & Humming

Self-generated vibration through humming, chanting, or toning directly stimulates the vagus nerve. The most accessible sound therapy tool — requires no equipment and can be used in any session.

CLINICAL APPLICATION OF SOUND BATHS

Group regulation sessions: Sound baths are highly effective as group regulation experiences for school classrooms, therapy groups, and staff professional development. A 15–20 minute sound bath before a demanding activity measurably reduces arousal in most participants.

Individual sessions: For children with significant hyperarousal, sensory sensitivities, or trauma histories, a brief singing bowl or tuning fork protocol at the start of session can shift NS state more effectively than verbal co-regulation alone.

Note: Sound baths are contraindicated near cochlear implants. Consult with the child's audiologist before use with hearing devices.

PART 4 — THERAPEUTIC LISTENING PROGRAMS

Evidence-Based Auditory Intervention Systems

These programs use specifically filtered, modulated, or composed music to target the middle ear muscles, vagus nerve, and autonomic nervous system — going beyond passive listening into structured clinical intervention

SAFE AND SOUND PROTOCOL

SSP — Dr. Stephen Porges / Unyte

Based directly on Polyvagal Theory · FDA-registered

WHAT IT IS

Filtered vocal music that exercises the middle ear muscles — specifically targeting the stapedius and tensor tympani muscles innervated by the facial and trigeminal nerves. Shifts the NS from defensive to social engagement state.

WHO IT HELPS

Autism · Anxiety · PTSD / trauma · Auditory hypersensitivity · Social engagement difficulties · Chronic dysregulation · ADHD · Selective mutism

CLINICAL DELIVERY

Provider-delivered (requires SSP certification) · 5-hour Core protocol + Connect and Balance pathways · Can be delivered in-person or remotely · Available individual and group

INTEGRATED LISTENING SYSTEM

iLs — Integrated Listening Systems

Combines auditory, visual, and movement components

WHAT IT IS

Multi-sensory program using bone and air conduction headphones delivering filtered classical music, paired with movement activities. Targets vestibular processing, sensory integration, and NS regulation simultaneously.

WHO IT HELPS

Sensory processing disorders · Learning differences · Auditory processing · Reading and language delays · Attention and regulation difficulties · Developmental delays · Anxiety

CLINICAL DELIVERY

Provider-delivered (requires iLs certification) · Programs range from 40–60 sessions · Can be delivered in clinic and at home with provider oversight · Individual and group protocols available

THERAPEUTIC LISTENING

Therapeutic Listening — Vital Links / Sheila Frick

OT-developed · Embedded in sensory integration framework

WHAT IT IS

Electronically altered music that provides organized, patterned sound to support self-regulation, sensory processing, and attention. Embedded within OT sensory integration treatment — not a standalone program.

WHO IT HELPS

Sensory processing differences · Self-regulation difficulties · Postural and movement challenges · Attention · Autism · Developmental delays · Auditory processing

CLINICAL DELIVERY

Delivered by trained OTs · Embedded into OT sessions and home programs · Twice daily, 30 minutes per session · Specific playlists selected by the therapist based on clinical profile

PROGRAM COMPARISON

At a Glance — Which Program for Which Presentation

FACTOR	SSP	ILS	THERAPEUTIC LISTENING
Primary target	Vagal tone · Social engagement · NS safety	Sensory integration · Vestibular · Multi-system	Sensory processing · Self-regulation · Embedded in OT
Theoretical base	Polyvagal Theory	Sensory integration + auditory processing	Sensory integration (Ayres)
Best for	Trauma, autism, anxiety, auditory hypersensitivity, social engagement	Sensory, learning, reading, attention, developmental delays	Sensory-based regulation within OT treatment
Delivery	5 hours total · Remote or in-person possible	40–60 sessions · Clinic + home	Embedded in OT sessions · Home program component
Movement component	No (passive listening)	Yes — central to the program	Paired with sensory activities in OT
Remote delivery	Yes — remote protocol available	Limited	No

FACTOR	SSP	ILS	THERAPEUTIC LISTENING
Group delivery	Yes — group protocols exist	Limited	Individual only typically

NOW TAKING CLIENTS

I am currently accepting clients for both the **Safe and Sound Protocol (SSP)** and the **Integrated Listening System (iLs)** — available individually and as group programs. If you are a therapist interested in referring a client, a parent looking for these services, or a school or program interested in a group protocol, please reach out directly.

Contact: info@helpinghandstherapyservices.com · helpinghandstherapyresources.com

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