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Narrative Review

Sound Decomposition Toward Healing: A Component-Based Narrative Review of Therapeutic Sound and Its Evidence Base

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Abstract

The therapeutic use of sound spans evidence-based clinical disciplines and popular wellness practices whose claims are not always supported by rigorous research. This narrative review reframes "sound healing" through a decompositional lens, treating any therapeutic sound as a set of separable acoustic components (frequency and pitch, intensity and amplitude envelope, temporal and rhythmic structure, timbre and harmonicity, spatial and binaural properties, and vibrotactile energy), and it asks which components are responsible for measurable physiological and psychological effects. Drawing on meta-analyses, Cochrane reviews, randomized controlled trials, and observational studies retrieved primarily from PubMed, the review evaluates six domains: music therapy and music medicine, rhythmic auditory stimulation, vibroacoustic therapy, binaural-beat and audiovisual entrainment, singing-bowl sound meditation, and frequency-specific tuning claims such as 432 Hz and the solfeggio frequencies. Evidence is strongest for the rhythmic and broad musical-affective components. Music interventions reliably reduce anxiety, pain, and stress-related autonomic and endocrine markers, and rhythmic auditory stimulation improves post-stroke gait. Evidence for component-specific "healing frequencies" is weak and confounded by expectancy. Across domains, benefits appear to arise from attentional, affective, autonomic, and neurochemical pathways rather than from any single curative frequency. Implications for component-isolation research designs and standardized reporting are discussed.

Keywords*:* Sound healing, Music therapy, Vibroacoustic therapy, Binaural beats, Rhythmic auditory stimulation, Brainwave entrainment, Heart rate variability

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Introduction

Across cultures and millennia, sound has been enlisted to soothe, energize, and heal. Contemporary practice, however, is strikingly heterogeneous. It ranges from music therapy, a regulated clinical profession with a substantial trial literature, to commercial "sound healing" services that rest on metaphysical premises. A central obstacle to evaluating the field is that these distinct interventions are frequently discussed as if interchangeable, so that robust clinical findings and unfalsifiable claims are bundled together under a single banner. The result is a credibility problem that obscures where sound genuinely helps and where it does not.

This review borrows an analytic move from acoustics and signal processing. Any sound can be decomposed into constituent parameters, including its frequency spectrum, intensity and amplitude envelope, temporal and rhythmic structure, timbre, and spatial properties, and this decomposition can be applied to the healing question itself. Rather than asking whether sound heals, the more tractable question is which component of a given intervention produces a measurable effect, for which outcome, and through which mechanism. Framed this way, the task is to identify the active ingredient in a complex acoustic stimulus. Accordingly, this article pursues three aims: (a) to specify the components into which therapeutic sound can be decomposed; (b) to appraise, component by component and modality by modality, the quality of the supporting evidence; and (c) to map the components most likely to be doing the work onto plausible physiological mechanisms. The review is narrative and integrative rather than systematic; sources were drawn primarily from PubMed and supplemented with secondary literature for cultural and historical context. Nothing herein constitutes clinical advice.

A Component Framework for Therapeutic Sound

Six components recur across the therapeutic-sound literature and provide the organizing scaffold for this review. The first is frequency and spectral content, meaning the pitch and the distribution of energy across the spectrum, which underlies popular claims about specific "healing frequencies." The second is intensity and amplitude envelope, including overall loudness and the dynamic shape of a sound over time, which modulates arousal. The third is temporal and rhythmic structure, that is, tempo, meter, and periodicity, the component that supports auditory-motor entrainment. The fourth is timbre and harmonicity, the balance of harmonic tone and noise that distinguishes a struck singing bowl from a pure sine tone. The fifth is spatialization and binaural difference, the interaural properties exploited by binaural-beat stimulation. The sixth is vibrotactile or mechanical energy, the low-frequency vibration that can be felt in the body as well as heard, which is central to vibroacoustic therapy.

Real interventions bundle these components together. A music-therapy session delivers rhythm, melody, timbre, and dynamics simultaneously within a therapeutic relationship; a sound bath combines complex timbre, low-frequency vibration, and a ritualized meditative context. Because the components co-occur, attributing an observed benefit to any one of them requires dismantling designs that vary a single parameter while holding the others constant. Much of

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the field has not yet done this, which is why the evidence is uneven and why the decomposition lens is useful: it makes explicit which component a given claim concern.

Approach

This narrative review synthesized meta-analyses, systematic and Cochrane reviews, randomized controlled trials (RCTs), and observational studies identified primarily through PubMed, prioritizing higher levels of evidence where available. For the cultural and historical claims surrounding specific tuning frequencies, which lie outside the peer-reviewed literature, secondary and grey-literature sources were consulted and are clearly labeled as such. The synthesis is organized by modality, with each modality mapped back to the acoustic component it most directly implicates. The review did not apply formal risk-of-bias scoring or quantitative pooling; its contribution is conceptual organization and evidence appraisal rather than statistical re-analysis.

Evidence by Modality

Music therapy and music medicine

A useful distinction separates music therapy, defined as personally tailored interventions delivered by a trained therapist, from "music medicine," which typically involves pre-recorded music listening offered by other health professionals [1]. Both target the integrated musical-affective content of sound rather than any isolated frequency, and the evidence for stress- and anxiety-related outcomes is comparatively strong. In a multilevel meta-analysis of 47 studies, de Witte et al. [1] found a medium-to-large, pooled effect of music therapy on stress-related outcomes ($g=0.72$). In surgical populations, Lee et al. [2] reported large reductions in anxiety (Hedges $g=-1.48$) and moderate reductions in pain ($g=-0.67$), alongside lower systolic blood pressure and heart rate, with the largest effects for interventions lasting 30 to 60 minutes. Among intensive-care patients, Xiao et al. [3] found that music therapy reduced anxiety ($SMD=-1.09$) and helped stabilize heart rate, respiratory rate, and systolic blood pressure, with no adverse events; notably, benefits appeared for 15- and 30-minute sessions but not when sessions exceeded 45 minutes, indicating a dose-response boundary (Table 1).

Beyond anxiety and pain, an update of systematic reviews by Gassner et al. [4] concluded that music therapy improves mood in depression, sleep quality in insomnia, and mood, neuropsychiatric behavior, apathy, and communication in dementia, with effects that are real but modest and condition dependent. Taken together, the music-therapy literature supports the claim that the broad affective and temporal content of music, delivered with appropriate dose and context, reliably shifts psychological and physiological stress markers.

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Modality	Primary acoustic component	Representative source(s)	Evidence strength	Direction of effect
Music therapy / music medicine	Integrated musical-affective and temporal	de Witte et al. (2020)[1]; Lee et al. (2023) [2]; Xiao et al. (2024) [3]; Gassner et al. (2022) [4]	Moderate to strong (multiple meta-analyses)	Reduces anxiety, pain, and stress markers
Rhythmic auditory stimulation	Temporal / rhythm (entrainment)	Magee et al. (2017) [5]; Scataglini et al. (2023)[6]	Moderate (Cochrane)	Improves post-stroke gait and motor timing
Vibroacoustic therapy / LFV	Vibrotactile low frequency	Kantor et al. (2022) [7]; Vilímek et al. (2022) [8]; Campbell et al. (2022)[9]	Preliminary / low	Possible HRV and mood benefit; specificity unclear
Binaural beats / AV entrainment	Spatial / interaural-frequency difference	Garcia-Argibay et al. (2018) [10]; Robison et al. (2021) [11]; Johnson et al. (2024) [12]	Mixed / weak for specificity	Small cognitive-affective effects; not beyond music or expectancy
Singing-bowl meditation / sound baths	Timbre, vibration, and ritual context	Goldsby et al. (2016) [13]; Seetharaman et al. (2023) [14]	Low (observational)	Reduced tension and anxiety; confounded
Frequency-specific tuning (432 Hz, solfeggio)	Single frequency / pitch	Bidari et al. (2023) [15]; Gueguen et al. (2023) [16]	Very low / unsupported in humans	No reliable disease-specific effect
Note: Evidence-strength labels are a qualitative summary by the author, reflecting study design and consistency rather than a formal grading. AV=audiovisual; HRV=heart rate variability; LFV=low-frequency vibration. Sources were retrieved primarily from PubMed.				

Table 1. Summary of Therapeutic Sound Modalities, Primary Acoustic Components, and Strength of Evidence

Rhythmic auditory stimulation and neurologic rehabilitation

Rhythmic auditory stimulation (RAS) isolates the temporal component more cleanly than any other mainstream modality: a steady auditory pulse entrains motor timing through auditory-motor coupling. The Cochrane review by Magee et al. [5] found that RAS improved gait after stroke, increasing gait velocity by approximately 11.3 metres per minute and stride length by about 0.12 metres (both moderate-quality evidence), with additional benefits for cadence, aphasia-related communication, and quality of life, although the majority of included trials carried a high risk of bias. A more recent systematic review of wearable-device RAS reported consistent improvements in gait speed, stride length, cadence, and range of motion in patients with movement disorders [6]. RAS is therefore the strongest example in the field of a single acoustic component, namely rhythm, producing an identifiable, mechanistically coherent effect (Table 1).

Vibroacoustic therapy and low-frequency vibration

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Vibroacoustic therapy isolates the vibrotactile component, delivering low-frequency sinusoidal vibration to the body, often combined with music. The evidence is promising but preliminary. In a pilot RCT, Kantor et al. [7] found that low-frequency sound vibration improved heart rate variability (HRV; LF/HF ratio and pNN50) relative to a control condition in university students. However, a randomized crossover study by Vilímek et al. [8] observed changes in HRV, mood, and perceived stress after sessions but found few significant differences between the active vibration and placebo conditions, concluding that the effects might be attributable to factors other than the vibration itself. A scoping review of low-frequency vibration in dementia identified only eight studies with recurrent quality problems in control conditions and blinding, yielding tentative signals and a call for higher-quality trials and neuroimaging to test the hypothesized mechanism of cerebral coherence [9]. The vibrotactile component is thus a plausible and emerging therapeutic ingredient whose specificity has not yet been demonstrated (Table 1).

Binaural beats and audiovisual entrainment

Binaural-beat stimulation targets the spatial or interaural-frequency component: presenting two tones that differ slightly in frequency to each ear produces a perceived "beat" at the difference frequency, which proponents argue entrains cortical oscillations (brainwave entrainment). The aggregate evidence is mixed, and the component-specific claim is weak. A meta-analysis of 22 studies found an overall medium effect (g=0.45) on memory, attention, anxiety, and pain perception, moderated by beat frequency, exposure duration, and timing [10]. Yet well-controlled follow-up work has repeatedly failed to confirm entrainment-specific effects. Robison et al. [11] found no consistent influence of beta-frequency binaural beats on sustained attention; in a tinnitus RCT, adding binaural beats to relaxing music produced no overall superiority over the music alone [17]; and in a large audiovisual-stimulation trial (N=262), mood and cognitive benefits were comparable whether or not binaural beats were present, and comparable to breathe-focused meditation [12]. An exception at the electrophysiological level is Gálvez et al. [18], who reported that binaural beats normalized EEG power and functional connectivity and improved working memory in Parkinson's disease, though without changes in gait or anxiety. On balance, any benefits of binaural beats are better explained by relaxation, arousal regulation, and expectancy than by the beat frequency per se (Table 1).

Singing-bowl sound meditation and sound baths

Singing-bowl practices bundle a rich harmonic and inharmonic timbre, low-frequency vibration, and a meditative ritual context, making component attribution especially difficult. In an observational study of 62 participants, Goldsby et al. [13] found that Tibetan singing-bowl meditation was followed by significant reductions in tension, anger, fatigue, and depressed mood and by increased spiritual well-being, with the largest tension reductions among those new to the practice. A narrative review reported associated improvements in mood, blood pressure, heart rate, and respiratory rate but concluded that the mechanisms remain unclear and that some proposed explanations, such as "biofield" interactions and chakra balancing, lack scientific support [14]. The psychophysiological relaxation response is plausible and may be genuine, but in the absence of controlled designs it is confounded with meditation, expectancy, and the social context; the metaphysical component claims, by contrast, are not evidence-based (Table 1).

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Frequency-Specific Tuning Claims: 432 Hz and the Solfeggio Frequencies

The purest popular form of "decomposition toward healing" is the claim that a single frequency carries intrinsic curative power, most commonly that instruments tuned to A4=432 Hz, or tones such as the 528 Hz "miracle" solfeggio frequency, are uniquely beneficial. Historically, international concert pitch was standardized at A4=440 Hz around 1939; the popular assertions that 432 Hz was a lost ancient or universal tuning, or that 440 Hz was imposed for manipulative reasons, are not supported by reliable evidence [19]. The primary scientific literature is thin and non-human. Bidari et al. [15] reported that prenatal exposure to music tuned to 432 Hz improved reflexive motor behaviors in mouse offspring, but the study presupposes 432 Hz superiority rather than testing it against alternative tunings. Gueguen et al. [16] found that a composite of selected frequencies reduced stereotypic behavior and improved welfare indicators in racehorses, yet the stimulus combined several frequencies and cannot isolate a specific curative tone. No robust human RCT establishes disease-specific effects of a particular tuning frequency, and the human reports that exist are small and preliminary. At present, component-specific "healing frequency" claims are unsupported by rigorous evidence; where listeners feel better, affective and expectancy pathways offer a more parsimonious explanation (Table 1).

Mechanisms: mapping components to physiology

The modality findings converge on a small set of mechanisms; each tied to particular components. The autonomic pathway is the most consistently documented: relaxing music and related sound shift autonomic balance toward parasympathetic dominance, lowering heart rate and blood pressure and increasing HRV [20,21]. The endocrine pathway is closely linked; music interventions reduce cortisol, and in one controlled study salivary and hair cortisol rose over an academic term in untreated controls while remaining stable in therapy groups [20,22]. The neurochemical-reward pathway connects the affective content of music to the brain's valuation system: using positron emission tomography, Salimpoor et al. [23] demonstrated endogenous dopamine release in the striatum at moments of peak musical pleasure, with the caudate engaged during anticipation and the nucleus accumbens during the peak experience. The entrainment pathway underlies RAS, where auditory rhythm couples to motor timing, and it is invoked, though less securely, for binaural beats. Finally, psychological mechanisms including attention and distraction, emotion regulation, meaning, and expectancy operate across every modality and are especially prominent in ritualized practices.

Mapping these mechanisms onto the component framework clarifies the landscape. The temporal-rhythmic component acts through auditory-motor entrainment; the integrated affective-musical content acts through reward and autonomic circuitry; the vibrotactile component plausibly acts through somatosensory and autonomic routes, though this is still emerging; and a specific tuning frequency has no established mechanistic pathway distinct from the general affective and expectancy routes available to any pleasant sound.

Discussion

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Decomposing therapeutic sound yields a graded rather than uniform picture. The components with the best support are rhythm, which drives motor rehabilitation through entrainment, and the integrated affective-musical content, which reduces anxiety, pain, and stress-related autonomic and endocrine activity. The vibrotactile component is promising but not yet shown to be specific. The interaural-frequency component exploited by binaural beats and the single-frequency component invoked by tuning claims have weak or absent component-specific support once expectancy and general musical content are accounted for. This ordering tracks how cleanly each modality isolates its component and how rigorously it has been tested.

Expectancy and context deserve emphasis rather than dismissal. The belief that a practice will help, the ritual surrounding it, and the therapeutic relationship are legitimate contributors to well-being, and they likely account for a meaningful share of the benefits reported for sound baths and tuning-based practices. The difficulty they pose is attributional: without credible sham conditions, improvements cannot be assigned to the acoustic component as opposed to the surrounding expectancy. Methodologically, the field is constrained by small samples, the inherent difficulty of blinding audible interventions, heterogeneity in protocols, frequent high risk of bias, inconsistent reporting of acoustic parameters and dose, and an overreliance on pre-post and self-report measures. The decomposition framing helps because it converts a vague question, namely whether sound heals, into testable ones about which parameter, at what dose, for which outcome, and via which mechanism.

Limitations of This Review

This review is narrative rather than systematic. It relied principally on English-language sources indexed in PubMed, did not apply formal risk-of-bias assessment or meta-analytic pooling, and may therefore reflect selection effects. Grey-literature sources were used for cultural and historical claims where peer-reviewed material is scarce and are labelled accordingly. These choices suit the review's conceptual aim but limit the strength of any quantitative conclusion.

Future Directions

The most valuable next step is component-isolation research. Dismantling RCTs could hold musical content constant while varying a single parameter. For example, the same piece could be rendered at 440 Hz versus 432 Hz, music could be delivered with versus without low-frequency vibration, or rhythm could be presented with versus without melody, so that any effect can be attributed to the manipulated component. Such trials need adequate blinding and credible active or sham controls, objective outcomes (HRV, cortisol, EEG, actigraphy), and standardized reporting of acoustic parameters and dose along the lines of established intervention-reporting checklists. Larger, preregistered, multi-site trials with mechanistic neuroimaging would help separate genuine component effects from expectancy. Progress in these directions would move the field from the broad assertion that sound is therapeutic toward a precise account of which components help, and why.

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Conclusion

Treating therapeutic sound as a composite of separable acoustic components reveals a layered evidence landscape. The temporal-rhythmic and integrated affective-musical components confer genuine, measurable benefits, including reductions in anxiety, pain, and stress-related physiology and improvements in post-stroke gait, delivered through autonomic, endocrine, neurochemical, and attentional pathways. Low frequency vibrotactile stimulation is a promising but unproven component, and claims pinned to specific "healing frequencies" are, on current evidence, unsupported. The way forward is research that isolates components rather than treating sound as monolithic, so that practice can be guided by which parameters work rather than by which stories are most appealing.

References

1. De Witte, M., Pinho, A. D. S., Stams, G. J., Moonen, X., Bos, A. E., & Van Hooren, S. (2022). Music therapy for stress reduction: a systematic review and meta-analysis. *Health psychology review*, *16*(1), 134-159.
2. Lee, H. Y., Nam, E. S., Chai, G. J., & Kim, D. M. (2023). Benefits of music intervention on anxiety, pain, and physiologic response in adults undergoing surgery: a systematic review and meta-analysis. *Asian Nursing Research*, *17*(3), 138-149.
3. Xiao, M., Gong, C., Mai, M., Huang, M., Xiong, A., Liu, H., & Jiang, R. (2024). Efficacy and safety of music therapy for the treatment of anxiety and delirium in ICU patients: a meta-analysis and systematic review of randomized controlled trials. *Minerva Anestesiologica*.
4. Gassner, L., Geretsegger, M., & Mayer-Ferbas, J. (2022). Effectiveness of music therapy for autism spectrum disorder, dementia, depression, insomnia and schizophrenia: update of systematic reviews. *European journal of public health*, *32*(1), 27-34.
5. Magee, W. L., Clark, I., Tamplin, J., & Bradt, J. (2017). Music interventions for acquired brain injury. *Cochrane Database of Systematic Reviews*, (1).
6. Scataglini, S., Van Dyck, Z., Declercq, V., Van Cleemput, G., Struyf, N., & Truijen, S. (2023). Effect of music based therapy rhythmic auditory stimulation (RAS) using wearable device in rehabilitation of neurological patients: A systematic review. *Sensors*, *23*(13), 5933.
7. Kantor, J., Vilímek, Z., Vítězník, M., Smrčka, P., Campbell, E. A., Bucharová, M., ... & Kantorová, L. (2022). Effect of low frequency sound vibration on acute stress response in university students—Pilot randomized controlled trial. *Frontiers in psychology*, *13*, 980756.
8. Vilímek, Z., Kantor, J., Krejčí, J., Janečka, Z., Jedličková, Z., Nekardová, A., ... & Campbell, E. A. (2022, June). The effect of low frequency sound on heart rate variability and subjective perception: A randomized crossover study. In *Healthcare* (Vol. 10, No. 6, p. 1024). MDPI.
9. Campbell, E. A., Kantor, J., Kantorová, L., Svobodová, Z., & Wosch, T. (2022). Tactile low frequency vibration in dementia management: a scoping review. *Frontiers in psychology*, *13*, 854794.

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10. Garcia-Argibay, M., Santed, M. A., & Reales, J. M. (2019). Efficacy of binaural auditory beats in cognition, anxiety, and pain perception: a meta-analysis: M. Garcia-Argibay et al. *Psychological research*, *83*(2), 357-372.
11. Robison, M. K., Obulasetty, M., Blais, C., Wingert, K. M., & Brewer, G. A. (2022). The effect of binaural beat stimulation on sustained attention. *Psychological research*, *86*(3), 808-822.
12. Johnson, M. A., Simonian, N., & Reggente, N. (2024). Lightening the mind with audiovisual stimulation as an accessible alternative to breath-focused meditation for mood and cognitive enhancement. *Scientific Reports*, *14*(1), 25553.
13. Goldsby, T. L., Goldsby, M. E., McWalters, M., & Mills, P. J. (2017). Effects of singing bowl sound meditation on mood, tension, and well-being: An observational study. *Journal of evidence-based complementary & alternative medicine*, *22*(3), 401-406.
14. Seetharaman, R., Avhad, S., & Rane, J. (2024). Exploring the healing power of singing bowls: An overview of key findings and potential benefits. *Explore*, *20*(1), 39-43.
15. Bidari, S., Zendehdel, M., Hassanpour, S., & Rahmani, B. (2023). Maternal music exposure during pregnancy influences reflexive motor behaviors in mice offspring. *International Journal of Developmental Neuroscience*, *83*(6), 546-551.
16. Gueguen, L., Henry, S., Delbos, M., Lemasson, A., & Hausberger, M. (2023). Selected acoustic frequencies have a positive impact on behavioural and physiological welfare indicators in thoroughbred racehorses. *Animals*, *13*(18), 2970.
17. Bakhtarikia, S., Tavanai, E., Rouhbakhsh, N., Sayadi, A. J., & Sabet, V. K. (2024). Investigating the effectiveness of music therapy combined with binaural beats on chronic tinnitus: A randomized controlled trial. *American Journal of Otolaryngology*, *45*(4), 104308.
18. Gálvez, G., Recuero, M., Canuet, L., & Del-Pozo, F. (2018). Short-term effects of binaural beats on EEG power, functional connectivity, cognition, gait and anxiety in Parkinson's disease. *International journal of neural systems*, *28*(05), 1750055.
19. Splice. (2022). 432 Hz: Does the tuning standard make music better? Splice Blog.
20. Moon, J. R., Song, J., Huh, J., Kang, I. S., Kim, J. H., Park, S. W., & Chang, S. A. (2023). The effects of music intervention on anxiety and stress responses in adults with CHD undergoing cardiac catheterisation. *Cardiology in the Young*, *33*(2), 213-220.
21. Trappe, H. J. (2010). The effects of music on the cardiovascular system and cardiovascular health. *Heart*, *96*(23), 1868-1871.
22. Finnerty, R., McWeeny, S., & Trainor, L. (2023). Online group music therapy: proactive management of undergraduate students' stress and anxiety. *Frontiers in Psychiatry*, *14*, 1183311.
23. Salimpoor, V. N., Benovoy, M., Larcher, K., Dagher, A., & Zatorre, R. J. (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature neuroscience*, *14*(2), 257-262.

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