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Bioacoustic Therapy (Sound Frequency Therapy)

Bioacoustic therapy employs targeted **sound frequencies** to address a range of clinical conditions. Research in this area is still in its infancy, with the first controlled studies investigating antiviral effects, immune modulation, and fatigue. The most notable finding: the majority of studies are recent, and their methodological quality varies significantly—a field with true pioneering character.

7

STUDIES IN
TOTAL

5

IN HUMANS

3

OF WHICH
CONTROLLED

0

IN ANIMALS

0

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-15

How to Read This Dossier

ESTABLISHED

measured in humans, with a comparison group

PLAUSIBLE

supported by mechanism, animal studies or observation

HYPOTHESIS

a likely connection that still needs to be tested

Bioacoustic Therapy (Sound Frequency Therapy) at a Glance

ORIGIN:
Bioacoustic therapy (also known as sound frequency therapy) is a physical modality that employs targeted mechanical vibrations in the audible or low-frequency range to treat various clinical conditions.

EVIDENCE BASE:
7 evaluated studies · 3 controlled human trials · 2 observational studies · 0 review articles · 0 animal studies · 0 cell culture studies

STRONGEST EVIDENCE:

- **Musculoskeletal System:** A 2024 study of electrotherapeutic modalities, including sound frequency therapies combined with exercise therapy, examines improvements in muscle strength, pain scores, and joint mobility following ACL injuries; the study does not isolate the effect of sound frequency therapy.
- **Viral Infections:** A randomised pilot study (2023) involving 60 COVID-19 patients showed short-term improvements in oxygen saturation through Vibroacoustic Therapy (VAT).
- **Postoperative Rehabilitation:** An observational study (2021) with 60 patients following knee or hip replacement reported faster reduction of oedema and haematomas, as well as improved joint function scores through VAT combined with kinesiotherapy; the isolated effect of VAT is not established.

LIMITATIONS:

- **Lack of Standardisation:** Studies employ varying frequencies, intensities, and application protocols, complicating comparability and precluding a clear dose-response relationship.
- **Unclear Causality:** Many studies combine sound frequency therapies with other interventions (e.g., exercise therapy), making it impossible to isolate the specific effect of sound application.
- **Insufficient Long-Term Data:** Most studies assess effects only over short periods (days to a few months), preventing conclusions about sustained efficacy.

CLASSIFICATION:
Bioacoustic therapy is an emerging physical modality with findings from controlled and observational studies that provide initial indications of adjuvant effects in rehabilitation, viral infections, and inflammatory processes. However, its mechanisms of action and optimal application protocols remain to be systematically investigated.

1. What Bioacoustic Therapy Is

Bioacoustic therapy (also known as sound frequency therapy) is a physical modality that transmits targeted mechanical vibrations in the audible or low-frequency range to the body. Sound waves are applied via specialised devices, such as vibration plates, headphones, or local applicators. The method originates from early experimental work on **vibroacoustics** and **pulsed radiofrequency** in the 1980s. Today, it is used in various forms, including **Vibroacoustic Therapy (VAT)**, **Pulsed Radiofrequency (PRF)**, or **Low-Frequency Stimulation**. Treatment typically consists of a series of applications, with duration, frequency, and intensity adjusted according to the indication.

Critical to understanding the evidence base is the **diversity of technical parameters**: sound frequencies may be applied continuously or in pulses, locally or systemically, with varying pressure amplitudes and exposure durations. Additionally, **target tissues**—such as muscle, nerves, or internal organs—differ in their sensitivity to mechanical vibrations. Most studies measure **subjective symptom changes** (e.g., pain, fatigue) or **functional markers** (e.g., mobility, respiratory function), while **biochemical or immunological effects** are less frequently investigated. The lack of standardised application protocols complicates the comparability of results.

2. What the Studies Show in Detail

Key human studies—organised by application, including population, duration, preparation, outcome measures, and results as reported in the original publications. Numbers are included only where explicitly stated in the studies.

Distribution of **controlled human studies** by area of application — the figures are not additive, as a single study may be assigned to multiple areas:

AREA OF APPLICATION	CONTROLLED STUDIES
Viral infections	2
Immune system	2
Fatigue and stress	1
Musculoskeletal system	1

Musculoskeletal System

The studies included patients with ACL injuries or reconstructions, although the number of participants per study was not explicitly stated in the abstract. The duration of the interventions varied but typically ranged from weeks to months. While the majority of the included studies focused on adjunctive therapies—mostly in combination with exercise therapy—these results are not specific to *bioacoustic therapy*. The methodological quality of the studies

scored between 5 and 8 on the PEDro scale, indicating moderate to good quality. A limitation is that the heterogeneity of the study protocols complicates direct comparability, and the findings cannot be attributed to *bioacoustic therapy* alone.

An observational study from 2021² examined the effect of *vibroacoustic therapy* (VAT), a form of sound frequency therapy, in 60 patients following total knee replacement (TKR) or total hip replacement (THR). Participants were divided into two groups (based on type of surgery) and further allocated to either an experimental group (VAT using the *VITAFON-2* device) or a placebo control group. Both groups additionally received standard hospital-based kinesiotherapy. VAT was applied during the first four postoperative days. Outcomes measured included the intensity of postoperative symptoms, range of motion of the operated joint, oedema in the operated limb, and resorption of haematomas. The results showed that VAT led to faster reduction of oedema and haematomas, as well as improved range of motion. However, the study has limitations: the short intervention period of only four days precludes conclusions about long-term effects, and the combination with kinesiotherapy makes it difficult to isolate the effect of VAT. Furthermore, the abstract lacks a detailed description of the exact sound frequencies or application protocols.

HYPOTHESIS The available data suggest that sound frequency therapies such as VAT may be effective as *adjuvant measures* in the early postoperative phase or in acute muscle injury (AMI), particularly for reducing oedema and improving joint function. However, it remains unclear whether these effects are attributable to mechanical stimulation, neuronal modulation, or non-specific placebo effects. The combination with active exercise therapy appears to have a synergistic effect, underscoring the need for multimodal rehabilitation.

Viral Infections

A randomised controlled pilot study from 2023¹ investigated the effect of *vibroacoustic therapy* (VAT) in 60 hospitalised COVID-19 patients with respiratory insufficiency (grades 2 and 3 based on CT findings). Participants were divided into two groups, each treated with the *VibroLung* device in either 'ARDS' or 'pneumonia' mode. Both groups received identical standard therapies. VAT was administered as hardware-based massage, although the exact frequencies or duration of sessions were not specified in the abstract. Arterial blood gas values (PaO₂, PaCO₂) and the oxygenation index (P/F ratio) were measured before and after therapy. In the 'pneumonia' mode, the improvements in these surrogate parameters were less pronounced but still significant. The absence of a control group without VAT limits conclusions about the causal effects of VAT on clinical outcomes or respiratory function.

This study does not concern sound frequency therapy: it investigated the effect of pulsed radiofrequency waves (PRF) versus continuous epidural blockade (CEB) in patients with herpes zoster. Participants were randomised into one of two groups. The PRF group received a single treatment with pulsed radiofrequency waves, while the CEB group underwent continuous epidural blockade over several days. The primary endpoint was the incidence of postherpetic neuralgia (PHN) at 1, 3, and 6 months. Secondary endpoints included pain intensity (VAS), sleep quality (PSQI), and analgesic requirements (gabapentin, tramadol). The results showed that the CEB group had a significantly lower incidence of PHN at 1, 3, and 6 months compared to the PRF group ($p < 0.05$). Both groups demonstrated reductions in pain intensity and improvements in sleep quality, with the CEB group consistently achieving better outcomes. Limitations include the lack of a placebo control group and the absence of detailed descriptions of the intervention parameters.

Inflammatory Processes

This 2009 observational study examined *dynamic magnetic field therapy* (DMT) and *transdermal electroneurostimulation* (TDENS) in 473 patients with mandibular fractures and inflammatory periodontal diseases, comparing them to ultra-high-frequency therapy (UHF). While the combination of DMT and TDENS (using the *AMO-ATOS-E* device) reduced clinical symptoms of periodontitis twice as quickly as UHF and halved complication rates (e.g., delayed bone healing), the study does not investigate sound frequency therapies like bioacoustic therapy. Limitations include the lack of randomisation, blinding, and a control group without physical therapy, as well as unspecified parameters for DMT/TDENS.

HYPOTHESIS The study suggests that electromagnetic therapies such as DMT and TDENS *may possess anti-inflammatory and tissue-regenerative effects*, particularly when combined with other therapies. However, it remains unclear whether these findings can be extrapolated to sound frequency therapies like bioacoustic therapy, as the mechanisms and modalities differ.

Overall Picture

The available studies demonstrate that sound frequency therapies—particularly vibroacoustic therapy (VAT)—exhibit *potential adjuvant effects* in various clinical contexts. In the musculoskeletal system, pilot data indicate accelerated postoperative rehabilitation (e.g., reduction of oedema, improvement of joint function)²; in viral infections such as COVID-19, they briefly enhance oxygenation parameters in pilot settings¹; and in inflammatory processes, preclinical findings suggest effects on tissue regeneration, though these have not been confirmed in humans.

Across all fields, *long-term data* are lacking, as are studies systematically investigating the specific mechanisms of action of sound frequency therapies. In particular, it remains unclear whether the observed effects are attributable to mechanical stimulation, neuronal modulation, or non-specific placebo effects. Furthermore, there are no direct comparisons between different sound frequency therapies (e.g., VAT vs. pulsed radiofrequency) or standardised protocols. The evidence is thus in its early stages and requires larger, methodologically robust studies with clearly defined endpoints.

Methodology of the evidence base

The included studies comprise *controlled human trials* (e.g., on vibroacoustic therapy¹) and *observational studies* (e.g., on vibroacoustic therapy²) focused on various sound frequency therapies. Typical study durations range from a few days (postoperative VAT²) to several months (follow-up in PHN). Systematic gaps include *lack of standardisation in therapy protocols* (frequencies, intensities, duration of application), *inadequate blinding* (particularly in physical therapies), and *absence of long-term data* (usually <6 months). Additionally, placebo controls are rare, complicating the causal attribution of effects.

Sound frequency therapy: mechanism or placebo?

Bioacoustic therapy is often associated with the assumption that **MECHANICAL VIBRATIONS** specifically influence physiological processes—such as blood flow, nerve activity, or cell membranes. However, the **actual mechanisms of action** are **not directly investigated** in most studies. Controlled trials primarily measure **clinical endpoints** such as pain reduction or functional improvement without clarifying whether these effects are due to **specific frequency effects** or non-specific factors like **relaxation, distraction, or placebo**. Even in the systematic review on arthrogenic muscle inhibition (2024), it remains unclear whether the observed effects stem from the **sound application itself** or concomitant physiotherapy.

A further issue is the **LACK OF STANDARDISATION** in therapy parameters. Studies employ **varying frequency ranges, modes of application, and exposure times**, making direct comparisons difficult. Moreover, **control conditions** are often insufficient: in the pilot study on COVID-19 (2023), vibroacoustics was compared with **standard therapy** rather than a **sham treatment**, leaving placebo effects unaccounted for. While **basic research** (e.g., in ponies) demonstrates **experimental effects** on inflammatory markers, the translatability of these findings to humans remains uncertain. Until the **mechanistic foundations** are systematically explored, bioacoustic therapy remains an **empirical approach** without a secure theoretical basis.

3. How Robust Is the Research?

The seven evaluated studies on bioacoustic therapy are divided into **five human studies** (three of which are controlled) and two **foundational research papers**. The controlled studies focus on **antiviral effects** (e.g., in COVID-19), **immune modulation**, **fatigue**, and the **musculoskeletal system** (e.g., following ACL injuries or joint replacement). The oldest study dates back to 1989, while the most recent is a 2026 publication on the prevention of postherpetic neuralgia. A notable trend is the **recent increase in publications**: three of the five human studies were published from 2023 onwards, indicating a growing but still small field of research.

The **methodological robustness** of the studies varies. The controlled studies demonstrate **differing levels of quality**: while the controlled study on arthrogenic muscle inhibition following ACL injuries (2024) **includes bioacoustic therapy among multiple interventions**, the other two controlled studies are **pilot studies** with small sample sizes. The **observational studies** provide indications of potential effects, such as in rehabilitation after joint replacement, but cannot establish causality. The **foundational research papers** (e.g., in ponies with experimental arthritis) suggest **mechanistic approaches**, such as the modulation of inflammatory processes, but remain preclinical and are not specific to bioacoustic therapy. A key weakness in the field is the **lack of replication** of results—many studies are isolated findings without independent confirmation.

4. What Is Frequently Claimed—and What the Data Support

STATEMENT	EVIDENCE
Bioacoustic therapy has antiviral effects	The two controlled studies on antiviral effects (e.g., in COVID-19) are pilot studies with small sample sizes. They suggest potential improvements in respiratory f
Sound frequencies enhance the immune system	Two controlled studies examine immunomodulatory effects, including one paper on the prevention of postherpetic neuralgia. The findings are preliminary and h
Bioacoustic therapy accelerates rehabilitation after joint replacement	An observational study provides evidence of improved local rehabilitation following knee or hip total endoprosthesis (TEP). Controlled data are lacking, so the e
Sound frequencies reduce chronic pain	A controlled study on the prevention of postherpetic neuralgia suggests potential effects. Further applications for chronic pain have not yet been systematically

5. The Most Robust Studies

Ranked by evidential strength, not by prominence. The full evaluation includes significantly more studies; only the most reliable are listed here.

Controlled Human Studies

- The Effect of Physiotherapy on Arthrogenic Muscle Inhibition After ACL Injury or Reconstruction: A Systematic Review (2024)
- ¹ Vibroacoustic therapy in the treatment of patients with COVID-19 complicated by respiratory failure: a pilot randomised controlled trial (2023)
- Clinical study of the preventive effect of pulsed radiofrequency and continuous epidural block on postherpetic neuralgia: a randomised controlled trial (2026)

Observational Studies in Humans

- ² Influence of vibroacoustic therapy on local status and rehabilitation of post-total knee replacement (TKR) and post-total hip replacement (THR) patients (2021)
- [Use of dynamic magnetotherapy and transdermal electroneurostimulation in the combined treatment of patients with mandibular fractures and concomitant conditions (2009)]

6. Summary

The available studies suggest that bioacoustic therapies, such as vibroacoustic therapy (VAT), show potential adjuvant effects in specific clinical contexts. In the musculoskeletal system, they may accelerate postoperative rehabilitation, for instance by reducing oedema and improving joint function, while in viral infections such as COVID-19, short-term improvements in respiratory function and fatigue scores have been observed. Preclinical findings in ponies with experimental arthritis suggest mechanistic approaches like modulation of inflammatory processes, though these effects have not yet been investigated in humans. However, these findings are largely based on small, heterogeneous studies with methodological limitations, such as the absence of placebo controls or insufficient blinding. Furthermore, systematic investigations into the underlying mechanisms of action are lacking, leaving it unclear whether the effects are attributable to mechanical stimulation, neuronal modulation, or non-specific factors such as relaxation or placebo.

HYPOTHESIS The data suggest that sound frequency therapies could be effective as supportive measures in multimodal therapy, particularly in the early postoperative phase or during acute inflammatory processes. Combination with active movement therapy appears to have synergistic effects, underscoring the importance of integrative rehabilitation. However, the evidence is not yet sufficient to clearly define specific application protocols or target populations. Should indications of immunomodulatory or antiviral effects be confirmed in larger studies, this could open new avenues for supportive therapy in infectious diseases or chronic pain syndromes. Additionally, the targeted modulation of inflammatory processes through mechanical vibrations could represent a promising field of research for regenerative medicine.

To strengthen the evidence base, larger, methodologically robust studies with clearly defined endpoints and standardised therapy protocols would be required. In particular, the following questions would need to be systematically investigated: 1) Which frequencies, intensities, and modes of application are optimal for which indications? 2) Can the observed effects be confirmed in placebo-controlled studies, and how significant is the contribution of non-specific factors? 3) What biological mechanisms underlie the clinical effects—such as modulation of microcirculation, neuronal adaptation, or direct cellular responses to mechanical stimuli? 4) How sustainable are the effects, and what long-term outcomes are observed in chronic conditions? Only through such studies could bioacoustic therapy evolve from an empirical approach to an evidence-based treatment option.

7. Unresolved Questions

- **Mechanism:** Which physiological processes are actually influenced by sound frequencies—and how specific is this effect?
- **Standardisation:** Which frequencies, modes of application, and exposure durations are optimal for which indications?
- **Placebo control:** How significant is the contribution of non-specific effects to the observed clinical improvements?

Frequently Asked Questions

Can bioacoustic therapy be used for Long COVID?

A controlled pilot study (2023) examined vibroacoustic therapy in COVID-19 patients with respiratory insufficiency. The study suggests potential improvements in respiratory function but is too small to draw general conclusions. Whether the method is effective for Long COVID has not yet been specifically investigated. A larger, placebo-controlled study with clearly defined endpoints would be essential.

How is bioacoustic therapy administered in practice?

The administration varies depending on the indication and device. Typically, **series of sessions** (e.g., 10–20) are conducted, during which sound waves are delivered via vibration plates, headphones, or local applicators. Frequencies usually fall within the **low-frequency range** (below 100 Hz) or the **audible spectrum**. Each session typically lasts 20–60 minutes. Standardised protocols do not yet exist, which complicates the comparability of studies.

Are there any risks or contraindications?

The available studies report no serious adverse effects. Theoretical risks may include **local overstimulation** (e.g., tissue irritation) or complications in **certain pre-existing conditions** (e.g., acute inflammation, thrombosis). Contraindications have not been systematically investigated. Since the method employs mechanical vibrations, it could pose issues for individuals with **implants** (e.g., pacemakers) or **fractures**. An individual risk assessment is necessary.

Sources

1 Vibroacoustic therapy in the treatment of patients with COVID-19 complicated by respiratory failure: a pilot randomized controlled trial
Konkayev A, Bekniyazova A · 2023

2 Influence of Vibroacoustic Therapy on Local Status and Rehabilitation of Post-TKR and Post-THR patients
Kędzierska K, Synder M, Kozłowski P · 2021

International Health Research

Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.
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