

The Islamic Science of Sound By Hwaa Irfan

16/05/2002

Traditionally, the artist had a community responsibility to develop the inner ear of the listener and create greater awareness of the unity of all things. In Persia, the sounds of birds or waterfalls were used to heal. Mothers often use a soothing voice to put their babies to sleep. The recitation of the Qur'an has been used for healing since the time of the Prophet (saws). However, not all sounds are healing. Some can be harmful.

The sound of music, for instance, affects pulse rates, skin temperature, blood pressure, muscle tension and brain wave activity. Music can also help to release biochemicals such as endorphins in the brain and act



as a natural painkiller. The human bone structure is also highly responsive to vibration, as much as 69%-79% of sounds heard within the audible range and sound move faster in water, which man is mostly made of. The bone structure then continually translates information from the more subtle levels into the neurological tissue. Inappropriate or loud music, on the other hand, can be harmful. A 1990 study purports that loud noise causes vasoconstriction causing increased blood pressure. In turn this leads to the hypertrophy of smooth muscle, a narrowing of small vessels and a resistance to blood flow.

Similarly, inappropriate sounds of any sort can be harmful. With increasing noise pollution a person's hearing can be damaging to the capacity to hear sound within a certain frequency range. In a laboratory study, volunteers were confined to a dormitory and exposed to pulsed tones over the course of 30 days. The result was that plasma cortisol and blood cholesterol levels increased with increased noise levels beyond 85 dB. The effect lasted for several days after the noise ceased. Such pulses can be found coming from air conditioning units, transformers and other electronic equipment.

Changes in earth's electromagnetic field caused by TVs, computers, power cables and radio waves effect people too by causing the body's energy waves to vibrate at unnatural frequencies. A branch of bioacoustics studies the effect of sound and noise on man. A pioneer in the field, Sharon Edwards proved that every muscle, compound, process and structure in the body could be mathematically calculated and assigned a tone. Bioacoustics addresses such illnesses such as epilepsy, respiratory and heart conditions, bone fractures, traumatic pain, multiple sclerosis as well as drug dependency and depression.

Sound Therapy addresses the issues of what sounds are helpful and what sounds are harmful to the body and aims to 'retune' the body back into harmony. In the same way, the intonation and variations in tune of a skilled Qur'an reciter can also invoke healing.

In Cymatics, another aspect of Bioacoustics, the understanding is that every cell in the body is controlled by an electromagnetic field with its own frequency. This therefore means that the body has a composite harmonic frequency! However, in Cymatics, the method isn't the cure. Like Homeopathy and some modern vaccines, Cymatics stimulates the regulatory, metabolic and immune systems back into balance. Dr. Peter Guy Manners developed an instrument that emits over 800 controlled audible frequencies. The required sound frequency is focused through a skin applicator from a transducer and has been found to be useful in rheumatic, bone and muscular disorders).

Many branches of Sound Therapy and Bioacoustics exist; however, one must not ignore what is nearest to them. Qur'anic recitations are an ideal way to enjoy sound therapy. As David Williams, self-awareness and self-development teacher informs us, "Harmonious sound vibration directed with appropriate mental thought disrupts negative qualities and transmutes them into positive qualities. Esoteric sound vibrations shatter rigid patterns..." (Williams, p.65).

"And [as for] the who follow the right direction, He increases them in guidance and gives them their guardian [against evil] (Surat Muhammad 67:17).

Vibroacoustic

As far back as knowledge extends, low frequency sound has been used in various forms to cause physiologic and psychological effects. From the chant of Tibetan monks, to Gregorian chant, to the Music of African tribes, and Australian aborigines; low frequency sound has been used to calm, to excite, to relieve anxiety, to motivate warriors, and to induce relaxation. Vibroacoustics is a scientific method of applying low frequency stimulation to the human body in such a way as to obtain desired emotional or physical effects. Vibroacoustics may be thought of as the science, which takes the active ingredients out of music, concentrates them, and infuses them in pure form to motivate or heal.

Researchers in Vibroacoustics use pure sine waves in the frequency range of 30 to 120 Hz. The frequency range below 20 Hz is called "Infrasound" as opposed to "Low Frequency Sound".

Most research in Low Frequency Sound has been carried out in Scandinavia, England, and other parts of Europe. Since 1991 research studies related to Vibroacoustics have been carried out at Duke University, the National Institutes of Health Center for Alternative Medicine, University of Virginia, the University of North Carolina (Asheville), Michigan State University (Kalamazoo Campus), etc. Controlled studies have demonstrated highly statistically significant decreases in anxiety, tension, muscle spasticity, arousal states, and dramatic increases in relaxation and sense of well-being. Psychological testing shows that people who receive vibroacoustic treatments generally feel better. The FDA has listed vibroacoustic related equipment as a Class One medical device. The FDA allows the claims of relief of pain, increase of blood circulation, and relaxation.

Vibroacoustics treatments usually take about twenty minutes. The subject sits in a vibroacoustic recliner, uses a hand-held transducer or lies on a specially designed bed or bed-pad. Pre-selected frequencies (sounds) are played through simple speakers or transducers. Specific frequencies can be effective at quite precise locations in the body so that the therapist can create programs to treat defined problems in a purposeful way. The sensation of a vibroacoustic treatment, analogous to that of being vibrated, is very different from mechanical vibration. It is perceived as much more pleasant. The sensation of sine wave stimulation is both pleasing and smooth. Vibroacoustics has a different approach to healing that medical tradition where the most commonly used nostrums rely on drugs. All drugs have side effects. Vibroacoustics can ameliorate pain without clouding the mind.

The mechanism of action of Vibroacoustics is oscillation of the human nervous system with frequencies and resonance characteristics of various muscle groups. Vibroacoustics combines these resonance frequencies in computer-generated programs. Thousands of clinical research hours have taught us how to use these programs to relax, to stimulate, to relieve pain.

To summarize, VAT is an enjoyable experience. VAT relaxes people. It makes people feel good about themselves. It relieves anxiety and pain. It decreases spasticity. It increases circulation. Cell vibration does this without side effects found in drugs.

PHYSIO-ACOUSTIC THERAPY HARMONIC OVERTONES IN THE WHALE-SONG CHAIR

By David Marsh

Many of us will remember the experiment with 2 tuning forks. When one was struck, it set the other off in sympathetic vibration. Sound is a physical thing, as we are reminded every time someone's bass notes come trundling merrily through house walls. We all know loud, harsh sound can be bad for us; what we don't so often think about is that sound can also have healing properties.

Olav Skille has now presented us with the concept of cell vibration therapy. Administered through comfortable sound furniture, the user is bathed repeatedly with pure, coherent (patterned & harmonious), sinusoidal sound waves. This methodology was designed by Olav Skille 25 years ago. Sine-waves are produced by a specially designed computer program. Waves of varying pitch, frequency and tone sweep the body; muscle groups and other organs tingle with vibration in sympathetic harmony as their own resonance frequencies are approached; the effect is like having a massage through the body. The experience is relaxing, as muscle tissue loses tension, blood flow improves and pain is eased.

The results of 15 years research and development into VAT or treatment by harmonious sound wave patterns, is an approved medical device and is being used in over 100 hospitals, psychiatric hospitals, old people's homes, health clubs and alternative and complementary clinics in and in various countries around the world.

VAT was initially for patients with brain damage and various forms of handicap, such as spina bifida. The equipment makes three medical claims. It has a vaso-dilatoric effect (and therefore lowers blood pressure); it relieves pain, stress and psycho-somatic pains; and reduces muscle tensions. It also is effective for insomnia.

Nine neurotic patients received ten thirty minute sessions. Stress levels were evaluated with 12 different methods, including measurement of blood pressure, pulse and pain, depression and anxiety evaluation: during the therapy all parameters showed a decreasing tendency. Statistically significant decreases were observed in the feeling of pain, tension and anxiety. Pulse and blood pressure also showed a decreasing trend (1).

A handicapped patient - with dystonia tetraplegica (whole body spasticity) received five 20 minute treatments per week. After three weeks this was reduced to 3 sessions per week. After five months the twisted body position was almost symmetrical. Feet and wrists were spontaneously relaxed. Therapy was stopped after one year for seven months; there was no deterioration in the physical condition. No other therapy was applied during this trial (2). Studies conducted in several institutes for handicapped people in Finland show that acoustic cell vibration therapy is beneficial for spastic patients.

How does it work?

Muscle, and other tissues resonate to special electro-magnetic and audio frequencies. Approximate resonance frequencies were found empirically and have been the general database for further refinement of vibrational specifications.

CONTRAINDICATIONS

No significant adverse effects have been found. Some patients may experience nausea or vertigo during the first treatments.

Music has been a common form of therapy in many cultures over the centuries; Dr Richard Williams (see below) suggests that 'perhaps the best-known application of sound in the healing arts has been in the field of music therapy'.

Sinusoidal sound (or sine) waves are used because of the purity of their sound. In theory there is no limit to the amount of harmonious overtones created by coherent sine waves. Such high frequencies are found in the resonances of cell membranes and intracellular microtubules (3). Biological tissue appears capable of storing energy, which can be released later when needed for high energy tasks, such as speeding up enzyme reactions. Cell vibration actually make cells work, as well as giving them periods of relaxation: scientifically it is classified as a form of exercise, like jogging. This aspect of the therapy is useful for patients who cannot exercise. A number of complementary therapies such as yoga, herbal medicine and acupuncture - to name but a few - are effective in relieving stress; but most require some sort of effort from the patient's side. Acoustic cell vibration does not require any effort at all – it is purely receptive.

The patients feel Vibroacoustics therapy as sympathetic resonance within muscles and other tissues. Vibroacoustics Sound Wave Therapy, focuses on the musculo-skeletal system, releasing stress and tension through deep body massage. It also works on the circulation, lowering high blood pressure and reducing both anxiety and pain, whilst boosting the immune system, so promoting better health.

Use of sound waves instead of mechanical vibration of cells is preferred because sound waves will gently massage each cell in the body. Vibroacoustics therapy is suitable for increasing physical and psychological well-being.

Vibroacoustics treatment has been used widely in Finland, England, Germany, Norway, Denmark and the USA.

Major applications of the Vibroacoustics method

Vibroacoustics method is used in medical or educational selections:

- Hospital and clinics
- Occupational health service and preventive health care
- Sports medicine
- General rehabilitation
- Rehabilitation of disabled and invalids

- Psychotherapy and psychiatric treatment
- Rehabilitation of drug and alcohol abuse
- Pain management
- Stress control
- geriatric rehabilitation
- insomnia

Sympathetic vibration

For VAT cell vibration the low frequency sound is created by a computer. The muscle, or other tissue, resonates (starts to vibrate) with the sound. This is called the principle of sympathetic vibration. In the Vibroacoustics treatment the sympathetic vibration follows the frequencies which are chosen by the therapist. The sound has a monotonous amplitude variation. When stimulation and rest periods follow each other, the relaxation is more effective. The continuous variation causes a undulating sound pressure inside the body. This pressure activates both blood circulation and the flow of lymphatic fluid. There is evidence that Vibroacoustics stimulation also has an effect on neuron chemicals. Amplitude pulsation and combination with various kind of music enable the therapist to create an almost unlimited amount of different combinations for different therapeutic needs.

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Vibroacoustic cell vibration, focuses on the musculo-skeletal system, releasing stress and tension through deep body massage. It also increases on blood circulation, lowering high blood pressure and reducing both anxiety and pain, in short - promoting better health. Vibroacoustics therapy is suitable for increasing physical and psychological well-being.

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1. Naukkarinen et al, 1990; Lehtikoinen, 1990).
2. Lehtikoinen, 1990; Leppala, 1990.
3. Adapted from Smith and Best 1989; Smith 1981

An Interview with Olav Skille: Sarajane Williams

1. What is VAT? How/why does it work?

VAT is a form of therapy where we transfer sound directly to the human body, using loudspeakers or transducers as the active medium. The loudspeakers are built into a chair, bed or couch and the patient is sitting/lying directly above the active surface. We know that sound penetrates solid mediums and liquids, and the human body consists mainly of water and solids. Vibrating the surface with sound, we also cause the sound to penetrate the body, and in this way we obtain internal massage. We claim that this massage has a positive effect on us. In VAT we combine low frequency tones in the VAT area (30 Hz to 120 Hz) with music. We can say that the low frequencies massage the body and that music is massaging the soul. IN VAT both the well and ill parts of the body receive the same stimuli - in this way we try to create total harmony in body and soul.

2. How did you become involved with/develop VAT?

After a discussion with Julie Alvin in 1968 on the physical effects of music, I thought about this for 12 years, and made the first prototype when I was working in a day care center for multi-handicapped children. We wanted to reduce spasms in the children, and used low frequencies to obtain this effect. Bass sounds are more relaxing than sharp treble sounds - also in auditive music. From 1980 onwards the whole concept has developed, and we now have more than 40.000 hours of experience behind us in the different centers and private homes in the world where VAT is used in one way or other.

3. Do specific body tissues or regions of the body respond to specific frequencies? If so, how were the specific frequencies determined? Are there individual differences in frequency response with patients?

Yes, we have found specific effects based on the harmonics of 40 Hz. If 40 Hz is the base, 50 Hz is a natural third above 40 Hz. 60 Hz is natural fifth above 40 Hz and 68 Hz is a diminished seventh above 40 Hz. We use 40 Hz for general muscle massage and for spasmolytic treatment. We use 50Hz and 52 Hz for menstrual pains, for low back pains and for lung massage to facilitate breathing in asthmatic patients. We use 60 Hz for spasmolytic purposes. We use 68 Hz for neck and shoulder pains. Based on the harp's E (which is about 41 Hz) the frequencies mentioned above give us a E7 chord. You know the chamber tone was once 432 Hz and not the 440 Hz of to-day, so I think we can permit us some artistic freedom here when we use E - or 40 Hz - as our basic therapeutic frequency.

4. Can you give an example or case study of someone who had a significant improvement from VAT?

We have seen considerable palliative effect in patients with Fibromyalgia, children with MLD or Cerebral Palsy, and in the treatment of menstrual pains. A patient with Multiple Sclerosis has been using VAT daily for 20 years, and is still able to do his job. He considers VAT to be the main factor in the unusually slow progression of his disease.

5. What conditions respond to VAT? Do psychological conditions respond?

As we see from the cases study above, we also can observe psychological effects of VAT. Body and soul are closely linked, and it is impossible to influence one of them isolated from the other. Psychological effects are : Reduced depression and deep mental relaxation. For conditions in which the patients rely on their muscle shield to keep sane, we must not induce this deep relaxation state, however.

6. In what way (if any) do you combine musical elements with specific frequencies to treat specific problems? What is the benefit?

I think I have answered the question above. But it is important for me to state that I always use frequencies tuned to the music I use on my therapy tapes. I usually make custom made tapes for patients or therapists who contact me. If I must choose between using a certain frequency and adjusting the frequency to the music I have chosen, I always let the musical considerations win. I do not want to put disharmonic frequency combinations into the body of a human being who needs harmonization.

7. Are there any contraindications to using VAT? Any adverse effects? Have any psychotic reactions been documented?

Active or border-line psychosis is a contra-indication, as the patient easily can go "over the edge". We also consider external or internal active bleeding (not menstrual bleeding) as a contra indication. Recent thromboses can start "moving" and we do not treat situations involving such possibility. The vibrations we use are not very different from the vibrations we receive when we sit in a bus with a diesel engine. Therefore they are not harmful in any way. It is important to use common sense.

8. What is your impression of VA/Harp therapy?

I have never thought about this until I met the harp players at the Music Medicine Symposium in San Antonio. I think the possibility of using live music - eventually combines with the above mentioned pre-recorded frequencies,- maybe as the base of improvisations on a set of harmonies based on one or more frequencies - is very interesting. Of course, it is more expensive than using recorded music, but using the harp live give us the positive effect of direct human contact which ought to be very important if we work in a mental hospital. We do not have any empirical data on this way of using VAT, and I encourage the harpist to try out new ways of use!

9. Do you have any suggestions/recommendations for practitioners who are interested in VA/Harp therapy?

You can read what I have written, keep in contact with each other - eventually using chat groups as the connecting medium, and share knowledge with each other. Sharing is caring. Competition will always make the individual weaker.

10. What kind of training or background do you recommend for potential VAT practitioners?

Both musical and paramedical education. I also hope that every therapist can have some education in scientific research, so we can get reliable and comparable data from each therapist. And : PUBLISH your experiences! Remember: all data are valuable in order to let us see the overall picture of how music will influence our physical and mental well-being.



11. In what settings is VAT used in Norway? How has the medical community responded to VAT?

Mostly in institutions for multiple handicapped, in institutes for physiotherapists and in geriatric institutions. Some individual users have bought equipment for home use.

13. What do you predict to be the future of VAT?

I think we will find many interesting ways lying open to us when we have enough anecdotal data collected to say that the evidence on the effect of VAT is overwhelming enough to convince the skeptics that VAT is here to stay and to be used - in many different ways, and

by means of many different types of equipment using the principles of VAT. Any time of sound furniture will provide good effects.

14. Any additional comments?

Yes,- I consider myself to be both a scientist and musician. I have always worked alone, on my own funding - all money spent on developing VAT has been taken from my income as a teacher. Commercial interests have entered the scene as the idea has spread and proven to be right. The systems known as Vibro Acoustics, Somatron, Vibroacoustics, Clark Synthesis and MVT have all entered the scene after 1980, and it seems to me that too much interest has been invested in what kind of sound furniture we use for transferring sound to the human body. For me the main interest lies in the **music** and the **sounds** we use. Without the sound (or vibration), which may come from a cassette, an instrument or some electronic source, the chair, bed or couch is silent,- dead! I have tried to put the enthusiasm and love of the musician-artist into my scientific work, and have been criticized by music therapists that I am too technical, and by university researchers that I am too unspecific. I think we need some sacrifices on both sides in order to cooperate and develop the still young therapy system which has got the name Vibroacoustic Therapy. We need the scientists in order to know what is going on, what really is happening. Being practicing therapists we need information from the researchers to refine our methods, but I really hope we do not stop being empathic, compassionate and intuitive artists in our work. VAT is here to stay - and it is our job to use it for the benefit of the patients we have responsibility for.

I really hope someone with funding and equipment would take interest in my observations around the effects of the frequencies involved in the elements of the E7 chord, because we **must** use the language of music also when we try to find explanations. I will share my findings with anyone.

Sarajane,- thank you for your interest. I always get stimulation out of the interest which is generated around VAT. **Let us continue to make music for the silent sound surfaces in order to improve the life quality of our patients.**

Footnote:

If in any context you are coaxed to believe that sound (music) and vibration are different concepts, -read Scientific American, October 1996, page 51: *«Friction arising from atomic-lattice vibrations occurs when atoms close to one surface are set in motion by the sliding of atoms in the opposing surface. (The vibrations, which are really just sound waves, are technically called phonons)...Solids are much like musical instruments in that they can vibrate only at certain distinct frequencies, so the amount of mechanical energy consumed will depend on the frequencies actually excited.»*

The language of music is consequently exactly as precise as the language of physics, and the synergetic effect of simultaneous use of the two languages may open some new doors in both fields in order to obtain physiological effects. It just needs some creative thinking.

VIBROACOUSTIC METHODS

Report from collected data from ca. 30.000 hours of practical use of Vibroacoustic Therapy during 1980 – 2005, based on anecdotal verbal and written reports from various sources.

Aim of investigation

- To present as reliable data as possible on the therapeutic effect of Low Frequency Sound Massage.
- Shortly present different systems of transferring Low Frequency Sound Vibrations to the human body.
- To present a hypothesis of which frequencies in the Vibroacoustic area (30 Hz – 120 Hz) are the most effective.

Methods

The patient is lying on a surface with one or more loudspeakers or transducers mounted under the surface. The trunk is the main target area for the sound waves. If we compare the body with a skin sack filled with fluid, it is evident that if the surface of the sack close to the loudspeaker membrane is agitated by sound waves, the vibrations will spread to the whole surface of the sack. It is then just as clear that all of the fluid inside sack also is vibrated. Accordingly, by using a coarse comparison, virtually every cell in the body lying over the loudspeaker area is vibrated.

Controlled studies have been nearly impossible because of the diversity of patients and unstandardised report procedures. Most reports have been sent in by staff members, therapists of varying professional background and parents. Some qualified pre-project studies have been carried out, though.

Results

Facts:

The sound waves penetrate all tissue and absorbs only about 2% of the energy transferred to the body.¹ The effect of low frequency noise in the body is different from that of vibration due to the impedance mismatch between airborne acoustical energy and the body. In 1987 there were done some hormone tests in connection with Vibro Acoustic Therapy at Sportkrankenhaus Hellersen in Lüdenscheid, Germany. The report from this project say that "there is a distinct rise in the stress-hormone level (Cortisol, Beta-endorphine, ACTH) during the treatment".² (n=40) No significant change in blood pressure was reported. They concluded that it was too early for further clinical studies, but encouraged Olav Skille to go on with his basic research.

History:

The original idea of VAT was to explore the therapeutic effect of sinusoidal frequencies mixed with music. The hypothesis was that pure bass frequencies are the most powerful element in the physiological effect of low frequency sound massage.

In order to supply eventual future users of VAT I had to invent the necessary hardware. An equivalent to 1,5 mill € coming from government funding, scholarships for inventors and

¹ Swedish Defense Material Administration: Infrasound: A Summary of interesting Articles. FMV elektro A 12:142 May 1985. (p. 33)

² Droh, Roland & Spintge, Ralph : Letter to T.H. Johansen 15.07.87 Klinische Erprobung Vibroacoustic-System.

other sources were spent in developing and marketing the first prototypes. The production ended when new and competing producers of sound furniture were successful in promoting their own brands inside or outside of patent claims. There are now several brands of Vibroacoustic devices on the market. Some of the most successful ones are the Somatron system in USA, the Soundchair in the UK and the Physioacoustics chair in Finland.

There have been several research projects based on my work. The most substantial one is Dr. Anthony L. Wigram's PhD dissertation on the effects of VAT.³

The effect on CP is described by Marit Hoem Kvam⁴.

VAT in physiotherapy is described by Allison Patricia Porter⁵ and in Germany VAT a test on children with reading and writing difficulties was carried out.⁶

Until 2000 I had made about 300 different C60 cassette tapes with frequencies and music blended together.

It appeared that it became impossible to choose between so many alternatives in which one had to choose both frequencies and music. The therapists were confused and mixed music preferences with therapeutic frequencies.

The system had to be revised, and simplified.

The latest reports come from parents with Brain Injured children in Gambia and USA (2003):

- A... has gotten very alert. She has started to play games at meal time.. This is something exiting,- A..'s arms are the most effected from her stroke. She appears looser and more aware of her arms. She is lifting the left arm up high to her mouth with out letting her neck drop. Before her head would go down instead of her hand going to her mouth. She tries to touch everything now. This makes her happy. While she was on her back she grabbed for a toy and brought it to her mouth. She never tried to pick things up before. She started to make a lot of new sounds. A.. is 3 years old with CP her whole body effected. (Kristine)
- I've been doing VAT with I.. for almost 2 months with very good results .I could see effects in her bowel movements - she always asks to go to the toilet after a session. The first week her urine was very smelly , I attributed that to the body getting rid of some toxins She shows some calmness and relaxation , better sleep ...After few sessions (about four days) she would lie down still on the bench very relaxed. If you look at her face you think she is dreaming . She started requesting the sessions herself which is a sign that they are making her feel good. It is the only thing that is calming

³ Wigram, A.L.: The Effect of Vibroacoustic Therapy on Clinical and Non-clinical Populations. PhD Thesis. St. Georges Hospital Medical School, London University 1996.

⁴ Hjælper vibroakustisk behandling? (Does VAT help?) Berg Gårds skriftserie nr 1/95. ISSN 0806-4342

⁵ Porter, A.P.: Vibroacoustic Therapy. The Therapeutic Application of Low Frequency Sound to Reduce Stress Discomfort and Elicit the Relaxation Response. Dept. of Occupational Therapy and Physiotherapy, University of Ulster. April 1993.

⁶ Schubert, T.: Wirkungen akustisch-vibratorische Stimulation auf ausgewählte Bereiche des Lern- und Leistungsverhaltens lese-rechtschreibschwacher Schüler. Statlichen Internatschule für Sprachbehinderte, Wentorf. Kiel, March 1994.

and relaxing her. It is helping us all.. I and my husband a go on the bench after she goes to bed , it is so good for back ache , to help you relax . (Viviane)

Conclusions

The difference between excitation by vibration and airborne sound may indicate that there is some difference between the effect of VAT given via loudspeakers and that of transducers. Reports from users, although mainly anecdotal, indicate that VAT can be an effective adjunct in recreational medicine and therapy. The therapy is described by the users as “soothing, reducing stress, muscle cramps and muscle pains”. A positive effect on menstrual cramps has been observed. The massage of the lungs has shown palliative effects in Asthma , Cystic Fibrosis and Metachromatic Leucodystrophy (MLD). Spasmolytic effects are observed in Cerebral Palsy and related conditions.

I believe to have found some general effects at the following frequencies:

It appears to me that very much energy has been used on documenting the effects of VAT equipment from several pre-project studies. There has been – to my knowledge – no statistically significant studies on a broader scale describing *the effects of the different frequencies*.

I have tried to describe the effect of four basic amplitude varied sinusoidal frequencies and their third and fifth harmonics, thus trying to have fairly good control over frequency and speed of amplitude variation. In order to keep these variables as stable as possible, I have made a set of 4 CDs with these fixed variables, and all work which has been under my control for the last two years – and eventual future use will be confined to this standard.

Any Vibroacoustic method is based on the use of some kind of sound furniture, some amplification equipment and a sound source. ***Without sound the two first parts of the equipment are totally ineffective. It is within the Sound the Power lies.***

I will recommend that future research must be directed towards finding out more about the effect of acoustic frequencies on the human organism – both in palliative and recreational medicine and therapy.

All my electronic equipment, prototypes, cassette tapes and correspondence from 1968 until 2001 has been handed over to the museum of Norges Musikkhøgskole in Oslo. The librarians are now working on catalogueing the material.

I have not had the opportunity to work within the framework of a scientific team or institution when I developed the basic idea of Vibroacoustic Therapy. I am very thankful for the practical and moral support I have had from ISFMIM from 1982 until today. Without this backing it would have been impossible to open this small peeping hole into the world of the physiological effect of low frequency tones. I hope the observations I have shared with you can be a stepping stone for someone who want to climb higher in order to get a more perfect understanding of how Sound and Man interact.

VIBROACOUSTIC THERAPY (VAT) AND RETT SYNDROME.

Observations made during the last 17 years indicate that VAT often can contribute to give the girls some muscle relaxing and spasmodic effects.

The equipment used is very varied, ranging from simple home made polystyrene bead-filled sacks used together with fairly simple stereo systems to commercially available systems like Somatron. In some European Snoezelen centres we can find locally made water beds with loudspeakers or beds of different designs with loudspeakers mounted in the chest/back support region. All such solutions are effective enough to demonstrate therapeutic effect.

Our observations show us that the therapeutic effect for girls/women with RS is best in the area round 40 Hz - combined with music chosen after the guidelines of Music Therapy - or simply using the preferences of the girls themselves, and/or their environment. When the environment round the girls send in preferred musical piece, one can be certain that the music used will be accepted by the users.

When the basics of a VAT unit is present (bed/chair, amplifier and software) the woman is placed on the unit. Preferably in a lying position with the loudspeakers under the torso. Avoid direct contact between the head and the VAT unit,- use a pillow under the head. Try to find the position which is most comfortable for the user.

If one is using a hard surface for the mounting of the loudspeakers, a foam-rubber mattress or a polystyrene bead-filled sack must be placed between the surface and the body. The first object of a VAT session is to have the girl feel the vibrations from the unit. This must be done gradually and softly in order not to be frightening. Let the girl relax for a minute or two.

Then we try to help the girl do some gymnastic exercises while lying on the unit. The movements should be chosen in cooperation with a physiotherapist, using the basic patterning principles of ABR, Bobath, Vojta or IAHP etc. - adapted to the professional environment around each user.

In order to postpone the onset of eventual contractures in hands and feet, bending/stretching exercises of hands and feet/ankles and stretching of fingers ought to be included in the series of exercises.

If the girl is hyperactive or resisting to lie on the unit - the aim of the first 10 - 20 session can be to let the girl get used to the environment and gradually see of it is possible to get her (gently) down in a lying position.

If the girl moves her hands to the mouth or starts the plucking or hand-wringing movements, we can use the time spent in a VAT unit to straighten her arms and see how long she is able to hold the arms along the side of her body - preferably palms down and with the fingers straightened out. (open hand)

The tapes/CDs will normally contain frequencies between 35 and 50 Hz - musically adapted as far as possible to the musical key of the music which will be accompanying the frequencies. If the girl/woman has pains in connection with her menstrual periods, it is possible to make a special program with 52 Hz as the basic frequency in order to reduce the menstrual cramps. (This frequency works well for any woman, not only for those with RS.)

VAT may have a soothing effect which lasts longer than the actual duration of the therapy session. The duration of the effect differs from person to person and will also show variations according to normal good and bad days.

VAT can be administered for about 30 minutes per session, 2 - 3 times a week. It is important that we never let a girl with RS be left alone in the unit while the music is playing. This is a therapeutic procedure which can be done at home by parents or other assistants. It must **NEVER** be used as a parking place in which we put the girl in order to get some minutes off for ourselves!

VIBRO-ACOUSTIC TECHNOLOGY

The term vibro-acoustic therapy was first applied by Olav Skille to describe the use of low frequency sound and music applied as a tactile experience in the treatment of various physical and psychological conditions (1). The term has recently been defined as “A form of receptive music therapy employing the physical properties of sound and vibration, pulsed sinusoidal, low frequency sound between 30 Hz and 80 Hz is combined with relaxing music and is played through speakers built into a bed or chair. Patients lying on a vibro-acoustic unit experience a gentle, internal vibration in different parts of their body, depending on the frequency used.” (2).

Clinical Applications

Physical conditions that responded well to this treatment included neck and shoulder pain, lumbago, menstrual pain and chronic back pain (3). Psychological conditions that improved from this treatment include reduction in depressive symptoms, increase in motivation and reduction in acute psychosomatic symptoms (4).

How Does Vibro-acoustic Therapy Work?

The specific mechanism by which vibroacoustic therapy exerts its effects on physical and psychological conditions has not been specified. However, recent studies have shown that vibroacoustic therapy used on healthy people can decrease blood pressure, pulse rate and muscle tension as well as increased subjective feelings of health and well being (5).

References

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CLINICAL APPLICATIONS

Sound Therapy for Anxiety

Guided imagery has been empirically demonstrated to be an effective technique in helping individuals to reduce anxiety. One of the limitations of this technique, however, is that highly anxious clients often find it difficult to relax sufficiently to be able to experience a reduction in their symptoms. The use of vibroacoustic methods can enhance relaxation by reducing brainwave frequencies. The patients participating in this study reported significantly lower anxiety levels following brainwave entrainment. Vibroacoustic methods have also been shown to be associated with a decrease in blood pressure, pulse rate, and muscle tension, as well as an increase in feelings of health and comfort. By allowing individuals to relax, both physically and mentally, brainwave entrainment can increase the effectiveness of guided imagery and allow clients to benefit from a guided imagery experience which would otherwise elude them.

Sound Therapy for Insomnia

Anxiety, pain, or depression can often be underlying or complicating factors for insomnia. Guided imagery techniques which can be learned and practiced have been shown to be particularly effective in the treatment of insomnia. In addition, the association of imagery with reduced pulse rate, blood pressure and deep relaxation, can be a particularly effective therapeutic approach. Lane et al., from the Department of Psychiatry and Behavioral Sciences at Duke University Medical Center reported results supporting the hypotheses that sound frequencies affect cognitive performance and states of arousal. It was additionally suggested that these sound frequencies may also have applications for insomnia and other sleep disorders.

Sound Therapy for Depression

Although pain and depression are not always linked, there is substantial evidence that patients with chronic pain are more susceptible to experience depression, and the depression, may then increasingly exacerbate the pain. In many cases, psychological intervention can benefit patients suffering from both conditions. One advantage for the use of guided imagery and sound frequency therapy techniques for the treatment of chronic pain and depression is that both conditions can be addressed with the same protocols.

References

1. Ruutel E. The psychophysiological effects of music and vibroacoustic stimulation. *Nordic Journal of Music Therapy*, 2002, 11.

VIBROACOUSTICS-WHAT IS IT?

- What is Vibroacoustic Music?
- What are the benefits of vibroacoustic technology?
- How does it work?
- The Relaxation Response
- What does the Relaxation Response do?
- The Somatron Pain and Anxiety Management Program
- A Clinically Proven Non-Pharmacological Pain and Anxiety Management Tool
- About Anxiety and Tension (Stress) Reduction

What is Vibroacoustic Music?

Vibroacoustics—from vibro—to *vibrate*—and acoustics—to *hear*—is an innovative technology in which music and/or sound vibrations are *felt* as well as *heard*. The sound vibrations are administered through specially-designed speakers or transducers built into a recliner, bean bag chair, mattress, pad, table or other equipment—even a floor and wall! There are numerous benefits to health and well-being from the experience of feeling the sound vibrations as you relax onto vibroacoustic equipment.

Vibroacoustic technology has experienced widespread use in hospitals, healthcare facilities, wellness programs, education, and corporate organizations as well as being used extensively in private settings. Vibroacoustic technologies were first developed in Scandinavia between 1970 and 1980 independently by Olav Skille and Petri Lehikoinen. The U.S.-based Somatron Corporation began distributing designs in 1985. Since then, the technology has continued to evolve with new and more refined designs.

What are the benefits of vibroacoustic technology?

Research and clinical programs have reported that vibroacoustics provides a wide variety of mental and physical benefits. Vibroacoustics has been found to:

- reduce stress
- facilitate the Relaxation Response
- increase quality of life
- decrease the experience of pain
- reduce nausea, headache, anxiety, fatigue and depression
- calm and soothe restless behavior
- relax muscular hyper-tauticity
- improve range of motion
- promote muscle tone
- offer auditory and physical stimulation
- enhance communication skills
- develop sensory awareness
- promote a feeling of calmness
- enhance music appreciation

Research has provided clear data on these outcomes of vibroacoustics but there are other effects that have not yet been quantified or perhaps even identified. Scientific research continues to investigate the effects that vibroacoustics have on body chemistry, brain wave

frequencies, pain suppression, and a number of other responses. This research will bring a greater understanding of the effects of sound vibration. Specific information about vibroacoustic effects and research is provided in our Research and Articles sections.

How does it work?

The physical experience of sound vibrations combined with the use of calming music in vibroacoustic therapy has beneficial effects both physically and psychologically. The mechanisms behind these effects are not fully understood although it is clear that the vibroacoustic music experience triggers the Relaxation Response, a mind/body response with a myriad of positive health benefits.

Olav Skille, one of the original creators of vibroacoustic technology, presents a theory that builds on the work of Drs. Karel and Heda Jindrak exploring the concept that physical vibrations of sound provide an internal cleansing massage. Sound vibrations conducted throughout the body from our own vocal sounds (and vibroacoustic music) actually vibrate cells, organs, brain structures and tissues. It is speculated that this stimulation may help eliminate cellular wastes and assist in cleansing the body of these and other toxins. If this is true, vibroacoustic music and the vocal sounds we make may be the only ways we can actually get an internal massage!

Research has also demonstrated that vibroacoustics can work within the effective range of a vibration-induced, natural pain-suppressing mechanism of the Pacinian Corpuscles, pressure-sensitive nerve endings located in the subcutaneous and connective tissues surrounding visceral organs and joints. Chris Chesky, Director of Education and Research of the Texas Center for Music and Medicine at the University of North Texas, conducted research and correlated information about this natural process and vibroacoustics, reinforcing the concept that vibroacoustics can trigger this pain-mediating mechanism.

Existing scientific research helps us to understand why vibroacoustics can reduce stress, pain and disease symptoms but there is much more to learn.

The Relaxation Response

A primary outcome of the vibroacoustic music experience is the facilitation of a state of deep relaxation. Triggered by what is called the Relaxation Response, this mental, physical, and emotional state is characterized by lowered blood pressure decreased heart, breathing, and metabolic rates and mind/body coherence. Harvard professor Dr. Herbert Benson, the founder of the Mind/Body Medical Institute at Boston's Deaconess Hospital, coined this term. He found that the Relaxation Response yields many long-term health benefits in addition to the immediate effects created during the experience. The relaxing effect of music alone is well-known and used extensively in music therapy.

The combination of relaxing physical vibration and soothing music is a dynamic method to trigger the natural healing mechanisms of our body!

What does the Relaxation Response do?

You can trigger the Relaxation Response in many ways. Tai Chi, meditation, prayer and Yoga are among the numerous wellness modalities known to facilitate relaxation. Regardless

of the method used, the physical and mental changes are similar. When the mind becomes focused and free from intrusive, worrisome or anxiety-laden thoughts, the autonomic nervous system responds by stabilizing and down-regulating (slowing down) the heart rate, blood pressure and breath as well as relaxing muscle tone and reducing the production of stress hormones.

Physiologically, the relaxation response initiates the following changes:

- reduces oxygen consumption (hypometabolism)
- decreases blood pressure
- slows heart rate
- slows respiration rate
- relaxes muscles

Mentally, deep relaxation:

- changes brain wave frequencies (generally slowing down from beta to alpha and alpha to theta or delta)
- clears the mind from anxiety
- creates a feeling of calm and peacefulness

A particularly positive side effect of using vibroacoustics to get into the relaxation response is a long term benefit---the more people use this technology the more they learn to recognize the state of relaxation and, over time, become able to reach relaxation at will. Vibroacoustics is a great way to learn how to relax and develop relaxation as a daily habit

Program Benefits

The Vibroacoustic Music Pain and Anxiety Management therapy has multiple benefits including that it:

- is a non-drug, non-invasive approach to pain and anxiety management with no unwanted side effects
- addresses both the physical and psychological aspects of pain
- reduces anxiety as it lessens pain
- can be easily and successfully used by nursing or administrative staff
- is a one-time, cost-effective, capital expense

About Anxiety and Tension (Stress) Reduction

Anxiety and tension are common side effects of illness and disease that patients frequently identify and medical personnel must constantly address. Research demonstrates that high anxiety levels inhibit the healing process and perhaps increase susceptibility to cardiac and immunological disorders, among other health problems.

Tension, reported by patients also as anxiety and stress, was one of the symptoms most frequently identified in the NIH vibroacoustic evaluation of pain and symptom reduction. Among the patients who identified tension as a primary symptom, an average of 54% reduction was reported from a single vibroacoustic session.

With clinical results demonstrating a one-half reduction of tension in a single session, vibroacoustics clearly provides a significant method for handling tension without drugs or negative side-effects.

FACILITY APPLICATIONS: HOW VIBROACOUSTICS IS USED!

Here are Program Reviews that provide examples of vibroacoustic therapy in actual practice at various medical and health-oriented facilities. General comments are made based on discussions with various practitioners.

Vibroacoustic equipment used in these examples is primarily Somatron products. However, programs are included that have used the vibroacoustics and BETAR systems. Other new designs are becoming commercially available. You may find information on various equipment producers.

Program Reviews

- Autistic Spectrum Disorders
- Childrens' Hospitals
- Developmentally Disabled Programs
- Geriatric Units
- Hospice
- Massage Therapy
- Medical Staff Rooms
- Museums
- Oncology
- Pain and Symptom Management
- Physical Therapy
- Psychiatric Treatment Centers
- Wellness, Spas and Preventive Medicine

Autistic Spectrum Disorders

Case studies and programs using vibroacoustic music have shown successful reduction of muscle tension, anxiety and gastrointestinal problems as well as benefits from increased stimulation and circulation and success in screening out upsetting sounds. On-task behavior, interaction and expressiveness have been reported to increase.

We use the Mat and Recliner in the Occupational Therapy department on pretty much a daily basis. It's mainly used as a relaxation tool. **We teach relaxation techniques while the clients are on the vibroacoustic equipment because it helps them to focus on the task of learning to relax.** To create an optimal environment, we have painted the wall area that faces the equipment black so that there is no visual stimulation to distract from the relaxation training. We found that eggshell black works better than glossy or flat blacks because it doesn't show fingerprints which were distracting the clients. We also sometimes use weighted blankets during the relaxation training to provide a light pressure because it gives clients more of a sense of calm.

The vibroacoustics is also a good tool to get people to initiate interaction because they

will ask for vibroacoustic sessions. Some use picture symbols and some ask verbally but they will interact to have a session. Sometimes we use calm, relaxing music but there are times when they just play their favorite music-ACDC or whatever they want-just to enjoy feeling the music.

The vibroacoustics does help clients calm down. We do not use it as a time out, but if people are upset and request it or if they are starting to become anxious and want to use it, we will give them a session to help them calm down. The vibroacoustics is in some of our behavior programs as a treatment option because it does help reduce anxiety.

The Voluntas program worked with benefits individuals with autism through the use of vibroacoustic therapy with low frequency sinusoidal tones. Attention was paid to effects on muscle tone, cramping, elevated blood pressure, accelerated heart rate, pain and behavioral and psychological problems and results showed positive benefits. Muscle relaxation was documented as was reduction of anxiety and ability to focus.

In one case study a 24-year old autistic man was found to reduce stereotyped behaviors and in general become more flexible and expressive.

Additional information about the findings of these researchers can be read in T Wigram, C Dileo (eds.) Music Vibration and Health. Cherry Hill, NJ: Jeffrey Books 1997:143-148.

Children's' Hospitals

Vibroacoustic equipment is in use in childrens' hospitals and Child Life programs. The vibroacoustics offers a nurturing and comforting experience for kids who are sick and in treatment. It can also function as a distraction, as can be seen in the example below at Dallas Childrens Hospital where staff have used vibroacoustics to distract children from pain and anxiety of medical treatment and procedures.. The Somatron Body Pillow model, much like a bean bag chair, is popular in Child Life programs.

Program Review: The Center for Cancer and Blood Disorders:

Children love the vibroacoustic music. The Hematology Clinic has used the equipment during medical procedures. The staff found that the music and vibration work especially well as a distraction factor with the children.

We used the vibroacoustics for the children during various procedures: bone marrow aspirations, spinal taps, biopsies. Often the children were also sedated or on cancer medications which might be producing side effects that could be helped with vibroacoustics. We have also used it during chemotherapy because it helps them relax and gives them something to focus on other than the treatment.

When the kids have to have a spinal tap it is important that they lie flat for 30 minutes following the procedure. We have them listen to their favorite songs on the vibroacoustic table as they are waking up and it helps them relax and be still.

Notes on Vibroacoustic Music for Children

The vibroacoustic effect works best with music that uses numerous low-frequency tones (bass lines and low pitches) and this should be considered when selecting children's music.

Some facilities allow children to bring in their own recordings and find this successful. Self selected music may help children feel some control in a situation where they have very little. Also, there is research to show that familiarity can be a factor in music effectiveness. The research finds that music that is familiar and enjoyed by patients is generally effective for relaxation and stress-reduction purposes. An exception is rap, heavy metal and other similar music styles that most often up-regulate the sympathetic nervous system, which can actually cause an increase in sensitivity to painful stimuli.

Developmentally Disabled

Vibroacoustic work with the developmentally disabled has been highly successful as stress reduction has positive physical and mental effects and improves quality of life.

Comments:

The vibroacoustic equipment is a wonderful thing for a lot of our patients, especially people with sensory organ impairments. **It gives needed sensory input or those who are blind and deaf. When we have patients confined to beds or a wheelchair, the vibroacoustic equipment may be their only option for physical stimulation and sensory awareness.** The sound and vibrations makes them more aware of their surroundings and gives them the physical stimulation they need.

We find the vibroacoustic equipment helps control negative behavior problems. The peaceful music combined with the music vibrations calms people and the deep tones relax them, eliminating unwanted behavior. We also use the vibroacoustic sessions as a reward for positive behavior because the patients enjoy using it and some will curb their negative behaviors just to use it.

Muscle relaxation is an issue with people who have physical disabilities that cause muscle contractions-using the vibroacoustic music helps their muscles relax. Some can't sit in a regular chair so a vibrating Bean-Bag is very good for them --they can get into a variety of positions in it. We also use the portable mattress on the bed. We can raise the head of the bed with the mat right on the bed so that the patient is in the best position and still getting the music vibrations.

The vibroacoustic equipment adds to our clients **quality of life**-that's what's important.

Geriatric Units

Vibroacoustic music has a number of benefits for the geriatric population. The physical vibrations of vibroacoustic technology are especially important to the health of older adults because tenseness and reduced circulation are of particular concern for this population. Vibroacoustics has been shown to increase circulation and induce relaxation with benefits to overall wellness and body functioning. Assisted Living Facility staff have commented that the relaxation induced by vibroacoustics helps patients' attitudes become more positive and

makes behavior management less of an issue. Pain, general fatigue, and malaise seem to be improved in these settings as well

Models such as the VAT recliners are particularly beneficial for geriatric populations due to the configuration of the chair

Comments:

We use the vibroacoustic equipment in a number of different ways. We have many patients who need to learn relaxation strategies. For example, the higher-functioning clients with dual diagnoses frequently have a lot of anxiety. Their Management Plans often include the development of relaxation strategies. Many of these patients don't even know what relaxation feels like. **The vibroacoustic music sessions give them a tangible relaxation experience.** Once the patient reaches a state of relaxation, the staff can point out the differences in their breathing, tremors or other physical characteristics. Most of these patients can remember the parameters of the relaxation state they experienced and create a relaxed state for themselves at other times. **Alzheimer patients have a high degree of anxiety, too and the vibroacoustic experience is good for them in this way as well.**

We also have elderly dementia patients with short attention spans, many of whom repeatedly struggle to get up and then sit down again, not remembering what they originally wanted to do. Some of these patients are at risk for falls and this constant up-and-down effort increases the chance of them falling and hurting themselves. Having these patients use the vibroacoustic music helps to calm them. **The vibroacoustics allows them to relax and helps focus their minds** and they are less likely to go through this repetitive pattern that could potentially be harmful to them.

For low-functioning patients with severe physical disabilities the vibroacoustic relaxation experience provides basic sensory stimulation. These patients have limitations in the ways they are able to receive tactile input and often can't provide it for themselves. Vibroacoustic music is a way to help them access sensory stimulation.

We have a need to work with low-functioning patients on basic motor/communication development such as ambulation skills or vocal sound production. **The vibroacoustic experience stimulates low-functioning patients and also helps them organize their motor responses.** The staff uses the vibroacoustic equipment to assist these patients' development process. For example, patients do "chair marching," moving their legs and feet in time to the music while they are on the recliner. The music, of course, helps to encourage and structure the patients' movements. Feeling the music from the recliner increases the stimulation as well as motivating them to continue the exercises.

The vibroacoustic sessions provide important stimulation and relaxation needs for those who have progressive terminal illnesses, such as Lou Gehrig's disease, which causes loss of all function and sensation. At our institution there are two children with metachromatic leukodystrophy-a disease in which patients gradually lose all function except cognition. The vibroacoustics provides these children with stimulation and relaxation in a way that they can receive it even as they start to lose abilities.

The music we use varies with specific clients. The staff uses classical music from Baroque, Romantic and Impressionistic eras---some synthesized and some with environmental sounds.

Clients do request some specific music like the Beatles. One client even uses a recording of his own singing.

Hospice

Vibroacoustics has been used in Hospice programs both for patients and with family members. The relaxation and anxiety-reduction capabilities of vibroacoustics has been found to be beneficial during this high-stress time of supporting a loved one through the transition process. Research initially indicates that patients enjoy the relaxation/distraction from vibroacoustic music and these sessions may also allow patients to use less medication. The vibration has been shown in one study to reduce skin disruptions caused from being bed-ridden.

Comments:

We use the vibroacoustic music for stress reduction with both the families of patients and our own staff. We find that vibroacoustics it is being used every day by family members. Families spend long hours with their loved ones at our facility. This is a very stressful and difficult time for them. Our department uses live music therapy for both patients and family but we can't be everywhere. **Having the vibroacoustic recliner here means we can use music to help family members even when our staff isn't available to them.**

We have had family members fill out comment cards about the vibroacoustic music and so far the responses have been 100% positive about the vibroacoustic sessions.

Our staff uses the equipment too. Their work is very intense. A "vibroacoustic music break" helps them be refreshed and ready to help the next patient.

Massage Therapy

Massage therapists have used vibroacoustics to enhance massage therapy. Therapists have reported that using it before a massage session gets muscles to relax as well as calming the client. A good way to start a session is to have the client start face up on the equipment and experience the vibroacoustics for 5 to 10 minutes. When massage work is started on the back, these muscles have become more relaxed and the massage work can reach a deeper level more easily. The music can be turned off when work begins on the back. The overall vibration experience enhances the relaxation process as well. See Muscle Tension, Physiological Responses and Relaxation and Stress Reduction research for related studies.

Vibroacoustic massage therapy tables are available.

Comments:

We work with massage and body energy techniques such as Reiki, Touch Therapy and our own form: Bhakti energy work. We also have a massage school-a number of our students also use vibroacoustics in their practices.

We use vibroacoustics during both massage and energy therapy sessions. With massage it is primarily used for relaxation purposes and we do find we can give a deeper massage using vibroacoustics because it relaxes the muscles. Also, it helps clients be more aware of their

body-some people are disconnected from their body and the vibroacoustics heightens sensations and awareness. Some of our work is for emotional release and we find that using the vibroacoustics intensifies the experience.

Medical Center Staff Rooms

Medical staff find vibroacoustic equipment a rejuvenating experience for break and meal times. The relaxing aspects of a vibroacoustic experience helps staff to rejuvenate mentally the circulation stimulation from the sound vibration are physically refreshing.

Physical Therapy

Extensive work has been done with vibroacoustics in physical therapy settings. Currently there are significant numbers of physical therapists using vibroacoustic equipment.

Vibroacoustic pioneers Tony Wigram and Olav Skille conducted a significant amount of research and experimentation with the vibroacoustics technologies Their findings verify that the relaxation-inducing effects of vibroacoustic music translates into benefits from muscle-tension reduction and increased range of motion. An important factor, however, is that over-stimulation of the muscles may result in increased tension. To resolve this, specific music compositional techniques and pulsations of sound, or limited session times, are incorporated into vibroacoustic sessions.

Research by Martha Burke on the use of vibroacoustics therapy for pain reduction following total knee replacement found greater passive range of motion and less pain during physical therapy following surgery.

The department using vibroacoustics works with developmentally disabled.

Comments:

I find that using the mats makes it easier to work with my patients both in being able to talk with them better and to give them more effective physical therapy. We put the mats on a table about 2 feet off the floor and the physical therapy is done while clients are on the mat. **The music and vibration helps patient do the therapy more effectively because they are more relaxed.** For the patients that can't talk, the vibroacoustics gives them something to focus on while doing the therapy. We use them mostly for our younger patients who are able to do the physical therapy but our older patients enjoy using them too.

Quiet music seems to work best .

Psychiatric Treatment Centers

The relaxation of vibroacoustics is especially valuable in psychiatric hospitals where stress and anxiety can be quite high, both for patients and staff. In addition, many patients are dual-diagnosed and may have physical difficulties that benefit from muscle relaxation.

The children at the Virginia Treatment Center range in age from four to eighteen years old. Many come initially for psychiatric evaluation, which can last from 48 hours to 30 or 45 days.

Rhonda:

In my 25 years of working with these young people, I have developed a vibroacoustic program that I find is effective for nearly all of my patients. When new patients arrive I teach them about the benefits of vibroacoustic music and give them an introductory experience on the equipment.

All of our staff members are trained in using the vibroacoustics and they provide vibroacoustic sessions for clients, too. **We use the equipment for behavior management, headache relief, and tension reduction. We also use it for wellness**, too---just to enjoy the experience. I find that all the children enjoy the vibroacoustics and it's especially appreciated by the children who are deaf. It's the only way that they can really understand how music affects their body.

Behavior management is a primary issue in our facility that I find is helped considerably through vibroacoustics. In fact, it so effective for behavior problems with our psychiatric patients that we have kids at the treatment center who have vibroacoustic sessions written into their treatment plan as a strategy for working with behavior issues. **I find that these sessions help the patients become more centered and the vibroacoustics assists them in organizing thoughts and actions.** If you're feeling fragmented, a vibroacoustic session can bring the pieces back together.

The kids love being on the equipment so we can successfully use it as a **positive behavior reward**. I offer vibroacoustic sessions at the end of my daily music therapy sessions as a reward for good behavior. The vibroacoustic equipment is extremely popular with the kids.

Staff and patients both use vibroacoustics for headache and tension relief. Chronic headaches are common with our patients. Headaches also are frequently a side effect of the medication prescribed to the children. The staff have problems with headaches too-there's a high level of job-related stress that comes with working in a psychiatric facility. The vibroacoustic music sessions help relieve headaches. I have found vibroacoustic music to be an important part of my work in helping children be successful in our treatment program

Wellness, Spas and Preventive Medicine

The use of vibroacoustics in wellness settings offers an effective and enjoyable stress management tool. Vibroacoustic music assists people in successfully experiencing the relaxation .

People who are not interested in, or unable to, attend on-going instruction in relaxation-related practices such as Yoga, Tai Chi or Mindfulness find vibroacoustics easy to use and enjoyable. They are often more likely to use the vibroacoustics. When used frequently, vibroacoustic sessions can essentially become a form of "practicing" the skill of learning to attain a relaxed state. Vibroacoustics can actually train people how to get into the relaxation response more quickly and easily so that they can access relaxation at will.

Research on stress shows that people who are able to get into a relaxed state easily have less illness and disease. Three 10-year studies found that chronic, unmanaged emotional stress was six times more predictive of cancer and heart disease than smoking, cholesterol level or blood pressure and is more treatable. People who are unable to effectively manage stress have

a 40% higher death rate than non-stressed individuals. [H. Eysenck. British Journal of Medical Psychology 1988; 61(1).] A study at disease and the ability to self-regulate emotions looked at the ability of 5,716 middle-aged people to self-regulate emotions. Those with the highest self-regulating scores were more than 50 times likely to be alive and without chronic disease 15 years later than were the people with the lowest self-regulation scores. [R. Grossarth-Maticek and H. Eysenck. Person Individ Diff. 1995; 19(6)]

Procedure for Vibroacoustic Therapy

This information is adapted from a document produced by Professor Tony Wigram (1995), Horizon NHS Trust Vibroacoustic Therapy Service (now Hertfordshire Partnership NHS Trust).

The procedure, which should be adhered to, can be categorised in six, clearly defined stages.

- a. Pre-session Preparation.
- b. Acclimatising the client.
- c. Commencing the Treatment.
- d. Monitoring the Treatment.
- e. Ending the Treatment.
- f. Post-Treatment Work.

Pre-Session Preparation

As part of the preparation for any session utilising Vibroacoustic equipment, the environment needs to be carefully prepared for the specific client who is to be treated. This type of treatment demands an atmosphere which is free of interruptions.

The room must be comfortable and the position in which the client will be lying, or sitting, should be prepared in advance. In the case of clients with physical disabilities, it is necessary to ensure that the correct amount of support, in the way of pillows or wedges, is available. The equipment itself must be ready. The CD's must be set prior to the commencement of a session, and the volume controls should be turned down to zero. This last point is important for, if you start a Vibroacoustic session with the volume turned up, the client will be subjected to a sudden jolt of sound. The stimulus, therefore, should be introduced gradually and with sensitivity.

Finally, the appropriate forms and noting charts must be easily accessible.

Acclimatising the Client

If this is the first time that a client has attended for Vibroacoustic therapy, an explanation of what is going to happen will be important. It may be necessary to reassure him/her that he/she has control over the situation. For example, if he/she finds the stimulus uncomfortable or irritating, he/she has permission to get off the bed or chair, or request that the volume be turned down.

This period of reassurance is equally important for those clients who are severely disabled or suffering from a profound mental illness. Tone of voice and choice of words help to promote a secure and relaxed environment.

As in any other therapy, this is a vital stage in the building of a trusting, therapeutic relationship.

Prior to commencement of the treatment, it may be necessary to help the client onto the Vibroacoustic bed/chair and position him/her comfortably. Position a pillow or cushion behind the client's head. This is partly for the sake of comfort, but also to ensure that the head does not make direct contact with the bed / chair and hence the low frequency vibrations. The treatment will usually involve the loss of body heat. A blanket should be provided.

Commencing the Treatment

Vibroacoustic Therapy is a unique combination of music and low frequency sound. When using low frequency vibration, it is important to introduce the stimulus in a sensitive fashion. Hence, a short period of response to the low frequency sine tone alone is necessary, prior to the gradual introduction of the music. The volume levels of both the low frequency sine tone & the music should be increased slowly & subtly, until the client feels acceptable levels of stimulation from each.

Experience has shown that many clients initially want the stimulus of the Low Frequency Sine Tone to be quite strong and will ask for the volume or intensity to be increased. However, after a period of time, perhaps ten minutes, it may be found that the stimulus has become too powerful to tolerate. Until the therapist has established the tolerance level of each individual client, a period of assessment will be required.

It is worth noting that the client's tolerance level may vary from one treatment to another, according to his / her psychological or physiological state. Sensitivity is an essential requisite, on the part of the therapist, at all times.

Monitoring the Treatment

The procedure is likely to vary for each client. Some clients will need comfort and reassurance and the therapist may decide to remain in the room. However, others will require absolute privacy and solitude. It is important that clients who prefer solitude are able to call the therapist back if necessary, by means of an inter-com or similar.

Those clients who are severely disabled, or who have mental health problems, will necessitate closer observation during the course of treatment. It is important, however, that the client does not feel that he/she is being watched, as this is a passive form of treatment. For this reason, the therapist's observations must be carried out as unobtrusively as possible. Observation of facial expression and body movement may be vital for some clients, especially

those who cannot express discomfort through the normal channels of verbal communication.

Ending the Treatment

Vibroacoustic Therapy treatments should last for between 20 to 30 minutes. At the end of the treatment the relationship between client and therapist will be particularly important. During Vibroacoustic Therapy, a client may drift into quite a deep state of relaxation. He/she may

fall asleep, dream and wake up feeling quite vulnerable at the end of a treatment. As in guided imagery in music (GIM) the client may enter an altered state of consciousness during treatment and will need the therapist for reassurance, guidance and support.

As at the beginning of the treatment, fade down the volumes of the Low Frequency Sine Tone & the music very slowly. Fade out the Low Frequency Sine Tone first, followed by the music a minute or so later.

At the end of the session, the therapist will need to evaluate the client's response. Physically disabled clients may require actual manipulation, in order to check whether there has been any significant improvement or not.

It may take some time for a client to recuperate after a Vibroacoustic Therapy treatment. Experience has shown that some people need to rest and some need to have a good stretch or move around a little. Research has indicated that reductions in heart rate, blood pressure and muscle tone, frequently occur during Vibroacoustic Therapy and it may take a little time for the client to come out of such a deeply relaxing form of treatment.

A client may become emotional after a session and need comfort and reassurance. It is important for the therapist to provide emotional support, without talking too much or making demands of the client.

Post Treatment Work

Record keeping is of the utmost importance in Vibroacoustic Therapy. The client's responses and reactions must be noted, along with any specific change in his/her condition. As a final measure, following treatment, the equipment must once again be checked. It is also good practice to ensure that the controls are reduced to zero, prior to the next client's attendance.

Conditions which Respond Well to Treatment with Vibroacoustic Therapy

** OSF followed by a frequency in Hertz indicates Olav Skille's recommendations for low frequency sine tone for the current condition.*

Anxiety (OSF - 52 HZ, 68 HZ)

'There is already evidence that the nature of the relaxation that occurs is enormously valuable in preparing clients with muscular difficulties for subsequent treatment of a more physical nature, and there is further evidence that clients with emotional problems and anxiety relax to the extent that they find it easy - and often necessary - to talk with the therapist after a treatment period.'

Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue. Studies in vibroacoustic therapy. In Wigram, A., Saperston, B. and West, R. (Eds.) *The Art and Science of MusicTherapy: a Handbook*. London: Harwood Academic.

APHASIA (OSF - 40 HZ, 60 HZ)

Vibroacoustic Therapy combined with Speech Therapy is positive, and increases the effect of the Speech Therapy.

ASTHMA (OSF - 50 HZ)

‘Problems of excretion of lung secretion may be eased by using frequencies in the middle range. The effect may last 1 to 2 days. In serious asthmatic conditions, the use of the equipment up to 15 times per day may be necessary.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Autism (OSF - 40 HZ, 68 HZ)

‘Autistic children became so engaged by the vibration effect that they could permit the staff to give them more skin contact/skin stimulation than they permitted in other situations. We may see the outline of a therapy setting where contact training during vibroacoustic therapy may be transferred to other situations where the music could be gradually withdrawn.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

BACK PAIN (OSF - 52 Hz)

‘Pains in the low-back area were relieved by the use of frequencies in the low middle region. Acute back pains because of sprained muscles or muscle cramps are relieved by daily treatments for 2 -5 days. Pains from muscular tensions of diverse causes have been reduced by treatments 2 -3 times per week for up to 4 weeks.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

BLOOD PRESSURE (OSF - 40 Hz, 60 Hz)

‘..... in the group we treated we found that we had a significant result in the reduction of systolic and diastolic blood pressure after vibroacoustic therapy.’

Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue. Studies in vibroacoustic therapy. In Wigram, A., Saperston, B. and West, R. (Eds.) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

CEREBRAL PALSY (AND OTHER SPASTIC CONDITIONS) (OSF 40Hz, 60 Hz)

‘With spastic conditions following cerebral palsy, vibroacoustic therapy has demonstrated a considerable effect. Alone, or in combination with physiotherapy, the method has given very good results in reducing muscle tone.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Circulatory deficiency (OSF – 40 HZ, 50HZ) ‘Patients suffering from severe circulatory deficiency in the extremities may find effective relief of this condition. These observations relate to polyclinical patients as well as to institutionalised patients with oedema’.

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Constipation (OSF – 40 HZ)

‘In some cases there has been observed spontaneous relief of constipation in institutionalised patients in whom natural mobility has been impaired. It is possible that the mechanical vibrations given by vibroacoustic therapy are giving new vigour to the natural processes in the digestive system.’ (40 Hz area - OS)*

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalisation and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Cystic Fibrosis (OSF – 50 HZ)

‘The gentle vibratory effect of low frequency sound waves on pulmonary tissue has been found to loosen lung secretions, thus affording better gaseous exchange in patients with cystic fibrosis, bronchiectasis and chest infections.’

Skille, O., Wigram, A. and Weekes, L. (1989) Vibroacoustic Therapy: The Therapeutic Effect of Low Frequency Sound on Specific Physical Disorders and Disabilities. *Journal of British Music Therapy*. 3, 6-10.

Emphysema (OSF – 40 HZ, 50 HZ)

‘There have been reports of very encouraging relief of symptoms in patients suffering from pulmonary emphysema’.

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Fibromyositis / Fibromyalgia

‘Patients suffering from this condition of cryptic pain seem to obtain some relief when they are exposed to single frequencies in the lower frequency range, directly followed by a multi-frequency tape*.’

***‘Multi-frequency tape’. Olav Skille can supply tapes or CDs with sequences of 3 - 8 different frequencies.**

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram,

A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

HIGH MUSCLE TONE

See under SPASTICITY

Hypertension (OSF – 40 HZ, 60 HZ)

A summary of results of research into the effects of vibroacoustic therapy on patients suffering from neurosis and hypertension found:

- 1. The treatment of elderly patients was more effective**
- 2. Women are more easily cured than men**
- 3. During the course of treatment the blood circulation was improved**
 - a) Acro-Cyanosis is diminished, temperature of limbs rises**
 - b) Systolic and diastolic blood pressure drop**
 - c) Headache and nausea vanish, improvement of cerebral blood circulation**
 - d) ECG - no remarkable improvement after one procedure - studies to continue**
 - e) EEG - large individual differences - needs more research**

The effect of the treatment is:

Rise of self confidence, fewer stomach troubles, fewer headaches, less depression and asthenia. Greater willingness to work’.

‘VA methods can play a considerable part in the treatment of neurotic patients and patients with hypertension.’

Skille, O. (1986) *Manual of Vibroacoustics*. Levanger, Norway: ISVA Publications.

Insomnia (OSF – 40 HZ)

‘Patients easily fall asleep during treatment and they have reported that after treatment they have less difficulty in falling asleep at their normal time for retiring and the duration of sleep is longer than they normally experience. This led to specific use as therapy for insomnia. Treatment for insomnia has best effects when it is carried out in the late afternoon.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) *The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy*. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Menstrual Pains, Premenstrual tension, Dysmenhorrea (OSF – 52 Hz)

‘Such pains and tension conditions have been relieved by using frequencies in the lower middle region and using calm, harmonic music. Treatment every day in the “acute” phase and once per week - repeated over 3 - 4 cycles - may give an effect of long duration.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) *The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy*. In Wigram,

A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Morbus Bechterew (OSF – 40 HZ, 60 HZ)

‘The effective diminishment of pain and discomfort from this rheumatic condition has been reported by several institutes. However, in the active phase of this disease one may find an increase of pain. Therefore Vibroacoustic Therapy should be used with caution when the inflammations are active.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalisation and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Multiple Sclerosis (OSF – 40 HZ)

‘Reduction of rigidity and considerable palliative effect has been reported’.

SKILLE, O. (1989) *conditions responding well to treatment*, cited in Skille, O. and Wigram, O. (1995) The effects of music, vocalisation and vibrations on brain and muscle tissue: Studies in vibroacoustic therapy. in Wigram, A., Saperston, B. and West, R. (eds) *the art and science of music therapy: a handbook*. London: Harwood Academic.

MUSCLE TONE

SEE UNDER **Spasticity**

NECK AND SHOULDER PAINS (OSF – 68 Hz)

‘Such pains - caused by occupational myalgia or as a result of stress from natural causes - were considerably relieved by using frequencies in the upper middle area. Repeated treatments over 1 to 3 weeks (up to 10 x 30 minutes) gave relief which last-ed for a long period.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Parkinsonism (OSF – 40 HZ)

‘During the year 1994/95 we undertook a study that supported the value of vibroacoustic stimulation as a beneficial treatment for Parkinson symptoms. We designed a double-blind randomized study of vibroacoustics (vibroacoustic therapy combining music and pulses of low frequency sinewaves) versus music without vibro acoustics. 60 patients with Parkinson’s disease from Txagorritxu Hospital, Basque Health Service, took part in the experiment. To assess the the efficiency of this treatment we have set up a follow-up of each patient through four assessment visits throughout one year. We have used the Scale of Daily Activit ies and the Exploration of Motor Aspects (both according to the Unified Scale of Parkinson-ian Assessment - UPDRS ii and iii) as well as subjective assessment by the patients themselves and by the doctor.

The assessment of the results has been positive, indicating that within the group of subjects under research their UPDRS changes significantly between the first and the fourth assessment in the areas of movement, personal autonomy and memory.'

San Vicente, P. del C., Manchola, I.F., and Serna, E.T. (1997) The use of vibroacoustics in idiopathic Parkinson's Disease. In Wigram, A. and Dileo, C. *Music Vibration and Health*. Cherry Hill, New Jersey: Jeffery Books.

POLYARTHRITIS (OSF – 40 Hz)

'Physiotherapists using vibroacoustic equipment have reported some relief of symptoms in patients suffering from polyarthritis, especially in smaller joints of the hands and chest.'

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Psycho-physiological effects

'At the Tallinn (Estonia) Pedagogical University good results have been obtained using music (including vibroacoustics) as a means for relaxation in combination with psychological counselling to treat stress related to psycho-physiological health complaints.'

According to the clients subjective assessments of changes in their health condition during the course of vibroacoustic therapy, the treatment has positive effects on heart troubles, anguish, nervousness, sleep disorders, headaches, etc.'

Ruutel, E. (1996) *The psycho-physiological effect of music and vibroacoustics in combination with psychological counselling*. ISME.

RETT'S SYNDROME (OSF – UNDER 60 HZ)

'It is apparent from these vignette reports (of assessment studies) that some positive responses are being achieved in almost all our subjects. In general, the children relaxed while on the bed, and there was a reduction in hyperventilation and tension levels. Sometimes with encouragement, and sometimes spontaneously, the client's handwringing or hand plucking decreased. Many of the clients showed signs of sleepiness. As a result, their general activity level was reduced, including a slowing of breathing rate, reduced movement and relaxation of muscle tone.'

(Subjects from the National Rett Therapy Clinic, Harper House Children's Service) Wigram, T. (1997) Vibroacoustic Therapy in the treatment of Rett Syndrome. In Wigram T, and Dileo C. Eds, *Music Vibration and Health* 1997 New Jersey: Jeffery Books.

Rheumatoid Arthritis - Pain Relief (OSF – 40 HZ)

'The purpose of this study was to determine the pain reducing effect of musical vibrotactile stimulation as compared to just music and placebo. Twenty four subjects with Rheumatoid Arthritis participated. MVTtm technology was used to provide measurable experimental stimuli. Using accepted pain measures, the pain relief of the music and

vibration group was significantly greater than the group with just music or placebo. Results prove that music vibration is an effective pain reducing modality for people with Rheumatoid Arthritis pain.'

Chesky, K.S., Rubin, B. and Frische, E. (1992) *The Pain Relieving Effect of Music Vibration on Rheumatoid Arthritis Patients as Related to Just Music and Placebo*. ISME.

Spasticity (OSF – 40 HZ, 60 HZ)

'The results we obtained showed clearly in all of our subjects that, when low frequency sound is combined with music, one can expect a greater range of movement - indicating a reduction of muscle tone - than when music is used on its own.'

Of particular value to us were the results with certain subjects in certain measurements. For example, Subject 9 has severe abductor spasm and the 9th measurement we took from her - showing a 31% improvement in her range of movement when we used low frequency sound - indicated that abduction was much easier after this treatment, thus lessening the danger of a fixed deformity which might well have led on to dislocation of the hip. This treatment was therefore welcomed, both from a long term point of view and as a short-term treatment..... In conclusion, these were objective, blind trials and gave a very positive result in favour of the use of low frequency sound to reduce muscle tone.'

Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue. Studies in vibroacoustic therapy. In Wigram, A., Saperston, B. and West, R. (Eds.) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

SPORTS INJURIES

'Therapists treating sports injuries have found vibroacoustic therapy a useful method of relieving pain. In over-use syndromes low frequency sound waves are reported to relieve pain and to reduce the length of the rehabilitation period. When treating injuries, it is at present advised that vibroacoustic therapy should not be used where there is any internal or external bleeding.'

Skille, O., Wigram, A. and Weekes, L. (1989) Vibroacoustic Therapy: The Therapeutic Effect of Low Frequency Sound on Specific Physical Disorders and Disabilities. *Journal of British Music Therapy*. 3, 6-10.

'Several cases have been treated with positive results. Both acute muscle traumas and post-operative convalescence have shown positive reactions to harmonic frequency sequences which are built on a basic tone in the low frequency area. Generally, low frequencies are given to the big muscles and we move upwards in frequencies when we are treating smaller muscle masses. Thus, the thighs need lower frequencies than the shoulders. It is recommended to use multi-frequency tapes in order to avoid too much stress placed on a single type of muscle tissue. Muscles and sinews are more easily stretched after tough muscular efforts.'

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Stress-induced depression (OSF – 40 HZ, 68 HZ)

‘Relief may be observed after the first treatment session. The positive effect is dependent on the right choice of both frequency and music. The choice of music must be made in co-operation with the patient, and the therapist must have a varied choice of relaxing music. Often “New Age” music may have a good effect. At the end of the treatment period various frequencies and activating music are used.

When dealing with general stress and discomfort, if the client is placed in a sheltered environment - protected as much as possible from external influence - a 30 minute vibroacoustic programme combining slow pressure waves with ‘floating’ music will alleviate stress symptoms and give the client new vitality.’

Skille, O. (1989) *Conditions responding well to treatment*, cited in Skille, O. and Wigram, A. (1995) The effects of music, vocalization and vibrations on brain and muscle tissue: Studies in Vibroacoustic Therapy. In Wigram, A., Saperston, B. and West, R. (Eds) *The Art and Science of Music Therapy: a Handbook*. London: Harwood Academic.

Harp Makes Music & Medicine Sarajane Williams¹

One of the oldest and most sacred instruments known to man, the harp has been used worldwide in healing traditions for thousands of years. Twenty years ago Lehigh Valley resident Sarajane Williams discovered for herself the archetypal significance of the harp when she sat down at this instrument for the first time. She recalls, "It opened a whole new world of beauty to me that I never knew existed. I felt its power." Today, Sarajane is using that power to transmit a healing experience for those who come to her for vibroacoustic harp therapy (VAHT).

Sarajane's introduction to the harp occurred while she was a nurse serving as director of a cardio-catheterization lab and taking evening courses toward a degree in psychology. Missing her beloved piano

"It couldn't make it to my third floor walk-up apartment" Sarajane was moved to study harp when she heard a tape of New Age harpist Georgia Kelly.

Sarajane is amazed at her good fortune. "Harp teachers are a rare find, and here I was living not more than ten minutes from Dorothy Knauss, a Lehigh Valley legend who recently celebrated her 65th anniversary with the renowned Allentown Band!" At her auspicious first lesson, Sarajane discovered that the harp was her instrument. Two and a half years after that first lesson she played at her first wedding. When in 1989 she went to work at the Gateway Institute in Bethlehem, Pennsylvania, an innovative chronic pain center, Sarajane was on her way to creating a career that would integrate all three of her professional pursuits: nursing, psychology and music.

At Gateway, pain management clients found relief from lying on a sound table inside a computerized contraption known as the Genesis Machine. They were bombarded with music from CD's, receiving the vibrations not just audibly but also tactually. ³I was beginning to feel more like a disk jockey than a therapist,² recalls Sarajane. And so she decided to experiment by plugging her harp into the system and providing the vibro-tactile experience for her clients directly through her own playing. The client/practitioner relationship was phenomenally enhanced as she was better able to fine-tune the therapy to the unique needs of

each individual. She found that specific notes would resonate in different areas of the body, resulting in a "musical massage" "Each client experiences the musical tones in different ways at different times," says Sarajane. "This makes the therapy a very dynamic process that requires catering to the unique individual. Not only is it a very promising therapy for pain and stress reduction, but it is a powerful tool for inner exploration."

In 1991 Sarajane left the chronic pain center and launched her harp therapy career using a portable sound table that she had acquired. It was not until the Internet was up and running that Sarajane discovered that vibroacoustic therapy was an established modality in Scandinavia, based on considerable research. A tone generator, developed by Norwegian Olav Skille, who first coined the term "vibroacoustic therapy" in the 1980's, was being used to apply specific frequencies for specific muscle groups. Often these tones were imbedded into recorded music to enhance the patient's receptivity.

Sarajane's approach is distinct in that she does not utilize a tone generator, only a live instrument. In the first session, while the client is lying on the sound table, she plays a variety of music to determine what kind of music elicits a specific mood. She plays specific notes to determine where in the body the notes vibrate and then improvises music to match the client's need. Most clients experience a decrease in anxiety or pain and tension. During a session clients may experience catharsis, witness images, connect with past lives, and may even smell aromas. Some have reported very dramatic effects lasting up to 36 hours. Sarajane can't forget the woman who came only at the urging of her son and was quite skeptical that this experience would in any way relieve her of the constant pain she'd been suffering following surgery on her shoulder three years earlier. During the harp therapy session her pain dissipated for the first time in three years, and she was able to swing her arms and enjoyed these benefits for some time afterwards.

Sarajane can share countless examples of the therapeutic effect of harp music from her years as a therapist as well as healing stories coming from other experts in the field. One such expert is Dr. Ron Price of Illinois who observed marked social development in emotionally disturbed boys after he taught them to play the harp. Such progress did not result among similar boys who chose to learn the piano instead. Dr. Price's enthusiasm for the harp is, in part, due to his own experience of keeping his Parkinsonian tremor under control as long as he practices the harp every day. After three days without practice his tremor returns. He founded the Healing Harps Program, which brings people with chronic disabilities together to play the harp. In this setting the rehabilitative powers of the harp have been frequently witnessed.

What is it about the timbre of the harp that makes it so relaxing and so health promoting? In order to address such questions, in 1996 Sarajane Williams started The Harp Therapy Journal. This quarterly publication offers a venue for therapists to share and document their findings (www.harptherapy.com). "Doors are starting to open," says Sarajane. "I have little doubt that our goal for the year 2020 will be reached." What is that goal? A harp in every hospital.

Ed. Note: Sarajane Williams will be offering a presentation at a March 30th event in Wayne, PA, sponsored by CAPHA. See the inside pull-out section for details.

New Developments in an Ancient Therapy

by Sarajane Williams

The field of harp therapy has emerged to link practitioners along a continuum of active to passive roles within the therapeutic process and to provide a forum to investigate the therapeutic qualities of the harp's timbre. Practitioners within the continuum include harpists who volunteer or are paid to provide a soothing environment, or clinically trained professionals, such as nurses, music therapists, psychologists or physicians, who actively use harp music as part of the therapeutic process.

Many individuals also learn to play the harp to ease their pain and stress, to provide physical rehabilitation, and to provide a positive social focus while learning in a group setting. Several training programs have been established in the United States to prepare harpists to play (in a passive, non-prescriptive capacity) at the bedside of patients in a hospital or hospice setting. Cedar Crest College in Allentown, PA offered the first accredited course of its kind this fall Healing with Music. Hospitals and hospices are now welcoming and employing harpists to provide palliative music for patient populations who are beginning to expect complementary therapies as part of a normal treatment regimen. A recent study, done at the Orlando Regional Healthcare System in Florida, revealed a significant decrease in pain and anxiety and a slight reduction in physiological variable values in patients who were exposed to twenty minutes of live harp music.



Vibroacoustic therapy can be defined as the use of music and sounds (as auditory and vibratory stimuli) transmitted to the body to achieve physical and psychological therapeutic goals. The stimulus may also include pulsed, low-frequency pure tones either singly or in a sequence. The stimuli are often delivered to the body through loud speakers built into a chair or bed unit.

One of the main figures in the development of vibroacoustic therapy has been a Norwegian educator and therapist Olav Skille.

The development of vibroacoustic therapy (VAT) in Estonia began in 1987 at the Tallinn Pedagogical Institute (Eha Rüütel) and later in 1991 at Jüri Health Centre (Riina Raudsik).

At Jüri Health Centre VAT is a method of treatment which may be combined with other treatments.

A summary of the work undertaken at the Jüri Health Centre between 1992 and 1993 was made and presented as a paper at the Seventh World Congress of Music Therapy in Spain by Riina Raudsik who is a physician and a head of Jüri Health Centre.

During the first year of utilizing this method, patients were selected for further treatment when the initial results appeared to be promising. Diagnosis of these patients were mainly within the area of functional disorders of nervous system, specifically:

- Tic syndrome (twist in facial muscles).
- Stammering (children).
- Enuresis nocturna (children).
- Tension headaches.
- Sleep disorders.
- Anxiety.
- Nervousness.
- Convulsions in muscles.

The main findings of our work with these clients indicate that vibroacoustic therapy:

- Stabilizes and relaxes the central nervous system.
- Has a relaxing effect on smooth muscles (blood vessels, bronchia).
- Accelerates the metabolism.

- Improves blood supply to organs.
- Obviously diminishes angiotensin secretion to the blood

thereby decreasing arterial blood pressure.

- Exerts the positive influence on the vegetative nervous system , causing the balancing of agitation and inhibition.

- May facilitate a placebo effect in that people believe in the new treatment and sometimes improve as a result of that.

The treatment tapes were made by dr. Riina Raudsik using the function generator. She likes treating patients with frequencies from 38-60 Hz. Vibroacoustic therapy has been enthusiastically received by many of patients who visit Jüri Health Centre. Now this method is being used by medical doctors in their everyday work.

People who deal with VAT:

Eha Rüütel –Estonia eha@tpu.ee 1998a. published “Vibroakustiline Teraapia”.

Riina Raudsik- Estonia-rraudsik@online.ee

Charles F. Butler - The United States of America, Michigan,

Kalamazoo.CBUTLER1@prodigy.net

And many others.

A VIBROACOUSTIC ENVIRONMENT

by helge jansen

updated June, 2004 © 2004



Since thousands of years cultures all over the world realized that sound and vibration have an enormous impact on the state of mind as well as on the physical body. Especially so called "primitive" cultures used music, drums, singing and chanting in religious ceremonies to induce certain effects on the body-mind-complex. Next to reaching different states of mind often healing or preservation of health has been the main focus of these practises. Shamanistic, chinese, indian, islamic, hebrew, greek cultures and many more, they all used soundvibrations for different purposes and had a natural insight into the correlation of sound, matter and mind. A very known example of the western culture is Pythagoras, who examined intensively the relation between the sound, the planets, the cosmos and the human.

He explained, that certain tones and sounds help to clear the mind, while others soothe and relax the body. His main instrument for reseach was a single chord spanned over a resonance body, the so called mono-chord, from which a lot of his conclusions derived. Hazrat Inayat Khan, one of the most famous persons following the tradition of the Sufis, tells us that music is: "Ghiza-i-ruh", food for the soul. It is just since a short time in the history of mankind that music is understood mainly as mean for entertainment.

In the last decades the strong alliance of sound and consciousness is being examined more and more by different disciplines, such as in music-therapy, consciousness research, vibroacoustic medicine and related fields from the sciences, art and medicine. Maybe supported by the fact that modern physics came to the conclusion the matter on the (sub)atomic-level is very much a vibrational phenomena. Nowadays the electronic music culture plays with a lot of these old elements, that are used to put people in trance (Techno,Trance-Music) with loop structures, repetitive bass drum rhythms and monotone, minimal compositions.

Due to my work as a DJ I listened and produced a lot of electronic music in the last years, where you simply can not avoid to listen again and again to certain loops and structures and it was so subtle but obvious at the same time, how the kind of sound you work with influences your whole mind, body and mood. It reminded me very much of the tradition of mantra-chanting in the Indian culture, where they use certain words and syllables and repeat them for hours and days and even longer for religious practice.

I wanted to know more about this whole field and started the research project "swinging matter", that examines on different levels the correlation of sound, form and consciousness. How do certain frequencies affect the body-mind-complex of the human? What kind of patterns are induced on matter that is being treated with certain frequencies? How is the brain and the nervous system affected by auditory stimuli?

Following the work of people such as Ernst Chladni (1756-1827) and Dr. Hans Jenny ("Cymatics"), I used the possibilities of highend transducers to deepen insight into that areas. The current focus of my work lies very much in the connection between intellectual

knowledge and physiological experiences using artistic practice to create a beneficial bond between mind and body. Meanwhile I started some investigations in the connection of ultrasound and the nervous system, which is regarded to play an important role in Dolphin-Therapy with mentally disabled children, as Dolphins have a very elaborate use of ultrasound with their sonar system. Next year I wish to expand my practical experiences in that field by visiting Dr. Frank Veit at the International Laboratory for Dolphin Behaviour in Eilat, Israel, who has worked intensively with the sea mammals in the recent years.

The "swinging matter" project is not a single work or installation, although it has different parts, that work on their own. To me it is an ongoing process, where I use that working title to have a focus that merges the different approaches to an understandable path.

I try to use selfmade electronic devices as much as possible as to be independent from industrial defaults and prices. On the left a detail of the LED-stroboscope, that is used to make the fast pulsation of the liquids visible. This is done via a small audio-pulse-signal (piezoelement) and a little controller to synchronize the processes.

The Invisible Force

Within the interactive environment I mainly use self-constructed MIDI-theremins, that I can program with different modes of modulation depending on the special setup. This literally invisible possibility of taking influence via electromagnetic field forces very much embodies my understanding of technology. To me, technology in media art is more like a background noise, a kind of invisible force, that pervades the whole, but never contains the essential.

As a first prototype of a vibroacoustic interface I developed a footbench, which transports the vibrations via the bones and the foot-reflex-zones through the whole body. By changing the posture and the parts of the feet that touch the vibrating surface you can feel the sound in different parts of the body.

The use of low-frequency sine waves for therapeutical reasons was first introduced by Olav Skille at the ISFFM symposium in the year of 1982.

The effect of vibrating impulses can be divided in three parts:

1. Relaxing of cramped or tensed muscles
2. Enhancing of blood circulation in the outer limbs
3. Noticeable, but varying effects on the vegetativum

During an accompanied sound-treatment the person lies on the wooden resonance body and I modulate the tone carefully and intuitively via a MIDI-controller. One of my hands always lies on the vibroacoustic device to feel the soft modulations and to keep in contact with the ongoing subtle changes of vibration.

To generate and control the tones and frequencies I use the program PureData. Next to electronic synthesis I work with natural sound sources, that I transpose by octaves in the low frequency regions.

"Music cannot be a clear symbol for certain concepts or emotions. Music is a mysterious function of our central nervous system, in close alliance with the feelings, intellect and motorical functions." (Ustvedt, 1937).

"We have the clear assurance that harmonical systems, like the ones we made visible with our experiments, evolve from vibrations in vibrations in form of intervalls and harmonical frequencies.

This is indisputable...if biological rhythms become generatively active with their own intervall-like frequencies, harmonical patterns are the necessary result." Dr. Hans Jenny, physicist, physician and sound-reseacher
