

Music Integrative NeuroTherapy,™ and Acupuncture

Research and Applications in Mood, Personality and Sleep Disorders

Alexander J. Graur, Ph.D.

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"Music Integrative Neurotherapy™ and Acupuncture: research and applications in Mood, Personality and Sleep Disorders"

Alexander J. Graur, Ph.D., MT-BC

Associate, University of Torino, Italy /Post-Graduate School in Health Psychology

Member, [The New York Academy of Sciences](#)

Email address: graur@medicamus.com

Website: www.medicamus.com

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Abstract

The ties between music and acupuncture, even if not completely evident to everybody, are as old as the Chinese culture is. What this applied research do is to present the use of some of these ties in the treatment of psychiatric and neurological patients with Music Integrative Neurotherapy™.

Due to the fact that in today's world most of the people, used mainly to commercial aspects of the music, have quite blurred ideas about what Music really is, I had to introduced in the context some basic notions about Music, related to the peculiarities of Music Integrative Neurotherapy™.

In this paper will be presented:

1. The approach involving Music as a Science and the fundamentals of Music Integrative Neurotherapy™;
2. The use of Acupuncture's basic philosophy and principles in acting upon the desired targets;
3. Clinical cases of **Depression; Schizophrenia; Insomnia**, one case for each disorder;
4. Protocols of therapy used in the clinical cases presented;
5. Statistics of results;
6. Conclusions and proposals.
7. Audio samples of the therapy, related to the clinical cases presented.

This paper pursues a dual finality:

1. To present an applied neuroscience method in which the principles of Chinese Medicine and Acupuncture play a fundamental role in the process of feed forward/ feedback of the audio and visual information;
2. To elicit the collaboration of professional acupuncturists in applying both the external intervention (acupuncture) and the internal intervention (Music Integrative Neurotherapy), in the treatment of Psychiatric and Neurological disturbs.

The most important conclusion of this applied research is that Acupuncture's and Chinese Medicine principles demonstrate to be really functional in various Western medicine fields of clinical application; and that, by using the mechanics of Acupuncture, Music Integrative Neurotherapy™ method can enhance significantly and speed up the effectiveness of Western medicine, Chinese Medicine and Integrative Medicine treatment of Psychiatric and Neurological disturbs.

NOTE 1: ⁱThe readers who are not accustomed with the Chinese Medicine's terms could find exhaustive explanations in the [¹, ², ³]

NOTE 2: to follow, M.I.N.T.= Music Integrative Neurotherapy™

NOTE 3: the audio files of the examples are presented in an audio compressed format (mp3).

That means the lowest and highest frequencies are not audible; in the real therapy they are audible, for the effectiveness of the therapy itself, delivered via special 3D sound headphones, and via computer.

This audio compressed format is due to the limited space allowed for the examples because of the length and weight of the original audio files (raw .wav format); however, it could give a general idea about the therapy.

In order to listen to the Audio examples the reader must be connected to the Internet.

All the computer based media players (PC and MAC) are enabled to reproduce these examples.

¹ *** ***The Complete Acupuncture CD***

² Maciocia, Giovanni: ***The Practice of Chinese Medicine***

³ Guan-Yuan Jin ,Jia-Jia X.Jin, Louis L. Jin: ***Contemporary Medical Acupuncture***

Background

Acupuncture operates by acting on the most extended organ of the body, the skin, with its two layers: the outer ectodermal epidermis and the inner mesodermal dermis; the last being richly supplied with blood vessels and nerves connected to various anatomic-physiological systems of the body.

Through the acupoints, the therapist works by inputting information to various reflex areas and/or acting upon the reflex points (outputting information from / redirecting it to, the body).

The maps of these points along various directions of related systems of the human organism, called channels and meridians, were discovered and developed by classical Chinese Medicine in the last three thousand years following the empirical research and practical application in the day by day life.

Acupuncture's points, channels and meridians are **not** anatomic entities in themselves; they represent ***physiologic functions and anatomical equivalents of functions***, which are the essence of neurophysiologic and neuropsychological relationships.

This fundamental aspect, largely understudied (or misunderstood) by the Western science caused, in the Western world, an underestimation of the capacity of Acupuncture to act in psychiatric disturbs, though the Chinese Medicine's experience shown clear and positive results in this field. [⁴]

Operating from inside the body by transmitting a special audio information to the brain which re-distribute it to the organism is the way in which acts the Music Integrative Neurotherapy™; a method on the borders between Music as a Science, Medicine, Molecular Biology and Quantum Mechanics.

M.I.N.T. uses the Brain-Mind-Brain-Organism system: the ways in which **(a)** the Brain receives the information (in this case, audio, or audio and visual information); **(b)** the Mind processes this information transmitting **(c)** the decoded results to specific parts of the Brain; which transmitted them **(d)** to specific organs.

These organs, in turn, transmitted to the **(a)** Brain the information regarding the effects upon them of the decoded original information.

⁴ Guan-Yuan Jin ,Jia-Jia X.Jin, Louis L. Jin: ***Contemporary Medical Acupuncture***

The process of feed forward and feedback of the information is cyclical and progressive and determines changes in the body's functions, which determine consequently changes in the behavior of the patients.

The general mechanic is: **[a → b → c → d] → [a → b → c → d] → [a → ... and so on (cyclical).**

It can be programmed from the beginning (**a**), creating the original musical information by using the physiological data regarding the parts of the brain and organism interested in a determined disturb, along with the personal medical data of each patient; all giving the parameters necessary to compose the music accordingly.

In composing the music for therapy the parameters of musical language are employed.

Many people think that music is **like** a language. No, music it is not **like** a language. Music **is** a language.

It presents therefore the basic four parameters which defined the phenomenon called language: the pre-speech (visualization/vocalization); a vocabulary (made by different sounds); a grammar; syntax and the specific natural logic laws governing the phenomenon itself.

In the presenting clinical cases the musical vocabulary is made of electronically generated sounds; consequentially, the grammar and syntax of the musical material created for therapy had to follow the rules of electronic music grammar and syntax.

That implied the use of packs of waves as generating basic musical cells, their organization in logical structures building the final musical form, and the sound processing techniques related to the final goal of therapeutic material elaborated.

This organization of the electronic music vocabulary permits, between other benefits, to calculate when the single pack of waves will collapse in time at the level of the limbic system, and where in the brain the resulting single wave stream will be directed as a consequence; a process that allow the therapist to calculate and plan better the final results of the therapy.

In case of a vocabulary formed by sounds belonging to the temperate system (modal and tonal subsystems) the specific grammar and syntax of this system are used. In case of a vocabulary formed by sounds belonging to the non temperate system, like the Chinese music vocabulary, the specific grammar and syntax will follow the rules of this system; and so on.

Acupuncture's principles are used in the permanent, cyclic process of feed forward and feedback of the audio information. M.I.N.T. obtains this in psychiatric disorders by using the proprieties of the three main aspects of

psychical and physiological levels of intellectual functions: P'o, Hun and Shenn and their relationships with the modern meridians concept.

The music used in this method is composed and personalized for each class of disturbs and for each patient, based on the medical and psychological data of him/her as resulting from the initial assessment.

It is not a music composed for entertainment or public performance, used randomly according to the therapist's choices and cultural background as music therapy it is often conceived. [5].

Previous studies involving sound and acupuncture [6] shown the interesting ways this combination could work sometimes. But sound alone it is NOT music. The concept is explained further in this paper; in this section I would like to mention two facts:

1. Music is the Science of organizing the sounds in logical structures; it is a language and a phenomenon which developed itself in five dimensions. [7].

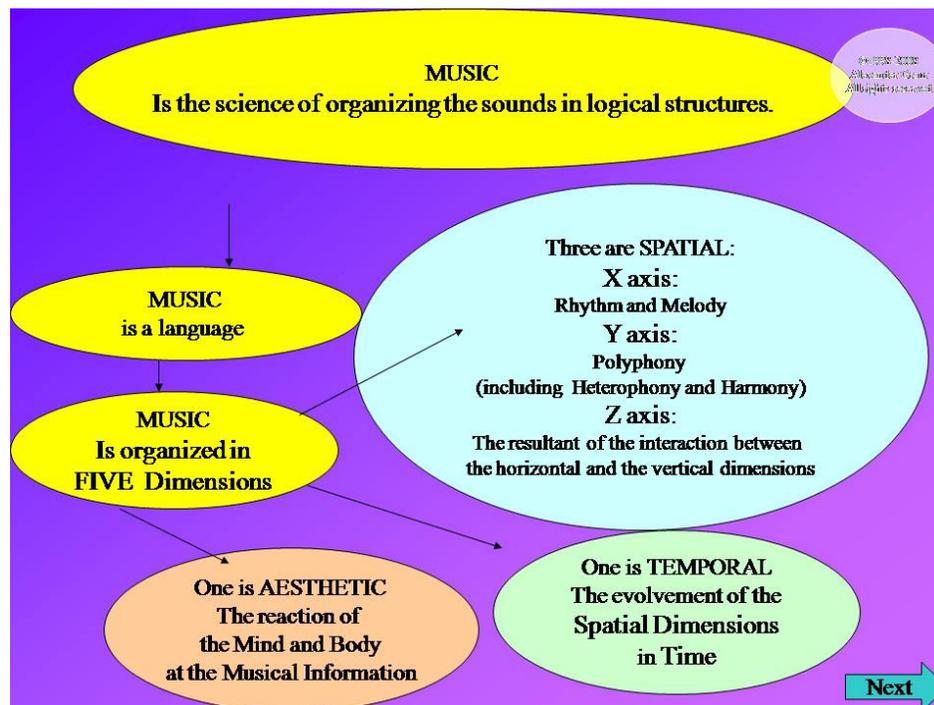


Fig. 01 : Music: definitions

⁵ Graur, Alexander : *Music Integrative Neurotherapy™, Part One: Body and Sound*

⁶ Pei Tingfu, Zhang Jin, Zhang Yimin and others: *Sono-Electrical Acupuncture Anesthesia*

⁷ Graur, Alexander : *Music Integrative Neurotherapy™, Part One: Body and Sound*

2. Each organ/plexus of the body resonates (i.e.: respond) at specific sound frequencies.

I calculated these values based on the results of research on electro acupuncture and auriculo therapy made by the French school of acupuncture (Dr. Paul Nogier), [8] with the necessary adjustments due to the high approximation of the values gave by the authors. I am applying these new values in therapy, where demonstrated their validity. [9]

Organ / Plexus	Favored Frequency (Hz)	Frequencies family	Favored registry	Note (musical)
Thalamus	(2300.0)+ 2349.3+ 2400.0	[4600.0...4698.0];[2300.0...2400.0]; [1174.0...1200];[587.33...595.0]; [293.67...299.5];[146.83...150.0]; [73.416...75.5];[36.708...37.5]	7 th	± D
Hypothalamus	[4040.5+ 4125.0+ 4186.0]	[2021...2093.0];[990.0...1046.5]; [498.0...523.25];[248.5...261.63]; [125.5...130.81];[62.5...65.406]; [31.0...32.703]	7 th	± C
Pituitary gland	[7700+ 7800+ 7902]	[3850.0...3951.1];[1900.0...1975.5]; [960.0...987.77];[480.0...493.88]; [241.6...246.94];[119.7...123.47]; [60.9...61.735];[29.840...30.868]	8 th	± B
Cardiopulmonary plexus	[1700.5+ 1760.0+ 1785.0]	[3480.0...3600];[860.5...895.0]; [432.0...444.0];[218.3...221.5]; [106.7...112.5];[53.0...56.0]; [27.5...28.8]	6 th	± A
Solar plexus	[1540+ 1568+ 1598]	[3065.0...3136.0];[760.0...795.0]; [390.0...398.0];[190.0...198.0]; [95.0...99.4];[47.8...49.5];	6 th	± G
Hypo gastric and splanchnic plexus	[1380.6+ 1396.9+ 1425]	[5360.0...5700];[2680.0...2850.0]; [680.5...703.6];[335.0...355.0]; [170.0...179.0];[85.0...88.9]; [42.0...44.9]	6 th	± F
Lumbosacral plexus	[649.0+ 659.26+ 672.5]	[5160.0...5380];[2580.0...2690.0]; [1295.0...1335.0];[318.0...331.0]; [160.0...168.0];[79.0...85.0]; [40.5...42.0]	5 th	± E

Table 1: Organs, plexuses and sound frequencies

Note 1 to the Table 1: Reference Registry: 4th (A4 = 440.0 Hz)
Optimal Audible Range: A0 = 27.5 Hz to D8 = 4698.0 Hz

⁸ Nogier, Paul et Raphael: "L'homme dans l'oreille",

⁹ Graur, Alexander : "Composing for Healing - Music Integrative Neurotherapy

Note 2 to the Table 1: In this case the + and - stands for ascending or descending intervals at a level of approximately 1.5 coma around the basic sound.

The natural sound as we perceived it is never a “pure” sound. It is a combination of sounds packed together, what musicians called a “cluster”. When common people listen to pure sounds, mechanically produced, almost always they have a sensation of artificiality and a reaction of resistance to information – with all the negative consequences for the psychotherapy.

Due to a forced cultural syncretism, some authors make a strange correlation between the chakras (plexuses and organs), in their classical order from the lumbosacral to the head, and the seven notes of a C based scale; some of them extremely specific even call it "C major".

There are music therapy techniques that consider a hypothetic therapeutic role of the tonalities, prescribing various musical pieces according to this presumption – a kind of sound design based on ignorance of music theory and ethnomusicology.

Some other believes in the correlation between astrology and tonalities, timbres and rhythmical patterns; the human imagination is unlimited, especially when scientific criteria aren't involved at all.

M.I.N.T. uses the achievements of acupuncture theory and practice as a mean to elicit the functional reaction of various organs at the audio and video information.

The ancient meridian theory has shown the existence and functions of well determined relations between various organs and plexuses of the human body. The input of information follows a path along the paired channels (Yin and Yang); the Acupuncture points sited along these channels act as relays of this information to the desired organs by regulating or modifying their functions.

Research demonstrates the complex function of meridians. The modern theory regarding the role of the meridians consider their function as whole body reflex zones (WBRZ) [¹⁰].

This theory, called acu-reflexology, grouped the acupoints in three major reflex zones: somatic, central and visceral. Each of these zones has its unique distribution patterns of the therapeutic information and its characteristics, overlapping in determined areas of the skin, either ectodermal or mesodermal.

The clinical research demonstrates the validity of this theory with two aspects: the propagating needling sensations along the meridians (PNSAM) and the observed external appearance of objective changes (EAOC) along or near the course of the meridians described by the antique and classical theory.

These subjective (PNSAM) and objective (EAOC) observed reactions help to understand better the role and importance for the therapy of the system of relationships called meridians. In the same time it suggests more implications for the ways this system could be used.

¹⁰ Guan-Yuan Jin ,Jia-Jia X.Jin, Louis L. Jin: *Contemporary Medical Acupuncture*

If the input of the information acts from outside-in following the WBRZ characteristics, then why information directed from inside and transmitted along the same path wouldn't work? (it was the question I asked myself thirty something years ago).

The M.I.N.T. follows the channel's distribution in the body and their functionality, acting through the connections and relationships of the various parts of the brain, the CNS, ANS and PNS with the organism.

The basic frequencies used to sustain the transmission of the whole musical therapy material are the eight ones found by Nogier [¹¹]; in the following table with the slight corrections added as a result of my research [¹²]

Name	Basic frequency (Hz)	Audible frequency (Hz)	Music Note	Acupuncture function	Average time to act
U	1.14	no	± D-		
A	2.28	292 [291.5 to 293.5] (listen ex.01)	± D3	consensus	2 min.
B	4.56	584 [582.5 to 585.5] (listen ex.02)	± D4	dispersion	5 min.
C	9.125	1165[1163.5 to 1166.5] (listen ex.03)	±C5/C#5	tonification	8 min.
D	18.25	2376 [2374.5 to 2376.5] (listen ex.04)	± D6/ E6	herald	1 min.
E	36.5	4612[4611.5 to 4612.5] (listen ex.05)	± D7	entry	90 sec.
F	73	73 [72.5 to 74.5] (listen ex.06)	± D1	exit	3 minutes.
G	146	146 [145.5 to 146.5] (listen ex.07)	± D2	well	5 minutes

Table 2: General basic frequencies (Nogier/Graur)

¹¹ Nogier, Paul et Raphael: "L'homme dans l'oreille",

¹² Graur, Alexander : "**Composing for Healing - Music Integrative Neurotherapy**"

Note 1 to table 2: the **U**, **F** and **G** are constant. The **F** acts on the sub cortical cerebral zones (functions **P'o** and **Hun**). The **G** acts on the cerebral cortex (function **Shenn**). [¹³] *and further in this paper.*

Note 2 to table 2: the reference value is the most prominent sound; in reality it is the aggregation pitch of the frequencies quoted in parenthesis. The examples are in a sinus wave format.

Note 3 to table 2: the cold laser therapy/auriculo therapy are using the reference values in higher harmonics range, not the real sound cluster.

Due to the fact that M.I.N.T. is acting from inside the body, in writing the therapy material the whole cluster have to be used. The **U** frequency is obtained by the subtraction of its general frequency from a slightly superior wave packs frequency (binaural sound).

In M.I.N.T. each of the above frequencies (**A**, **B**, etc) works as a **carrier wave** [¹⁴] for the packs of waves build in order to act upon the desired organ or plexus.

An example from the general protocol of M.I.N.T. therapy for mental disorders:

after the delivery of the built pack of waves based on the carrier waves Well+Exit (waves **G** and **F**), the Entry wave (**E**) is used as a carrier wave to stimulate the **L** (lung) channel. Then, through this channel are activated the channels sited in the hypogastric and splanchnic plexus, in order: the **SI** (small intestine), the **LI** (large intestine), the **S** (stomach), the **SP** (spleen), the **G** (gall-bladder) and the **Liv** (liver) channels.

(see further the **Table 4** for the group of frequencies implied).

If we consider the fact that the greater- the lesser- the least splanchnic nerves are an important component of the sympathetic system, acting not only upon the viscera but also, through the sympathetic system, on the whole brain activity, we can understand the complex relationships between the hypogastric and splanchnic plexus and the brain's activity. The Acupuncture use the points sited on the above mentioned channels to act in various types of mental disturbs, from mood disorders to personality disorders.

In M.I.N.T. the audio stimulus is transmitted along the channels used by Acupuncture with an apparently non-linear path, enforcing both the theories of ancient Chinese Medicine as of the modern biology.

¹³ Nogier,Paul et Raphael: "L'homme dans l'oreille",

¹⁴ Feynman,Richard:: *The Feynman Lectures on Physics*

The role of the cytoskeleton could be a fascinating and close to the reality hypothesis; it is anyway a logic explanation of the phenomenon, at least at the present time.

The chain of molecular reactions started by the Acupuncture's intervention in the points along the meridians is supported by the cytoskeleton functions and follows the mechanics of the transmission of the information along it.

These mechanics could be a demonstration of the biomolecular non-linear transmission of the information, the role of the cytoskeleton being determinant in this transmission (for a detailed exposition of the cytoskeleton role and functions see [¹⁵])

Together with the Chinese Medicine' traditional explanations, the biological non linear transmission of the signal could be at least one explanation of why the acupuncturist's intervention in a point along one meridian acts on a distant organ of the body apparently not related to the part of the body where the acupuncture's point is sited. It could also explain the reverse process, from brain to various parts of the body following the acupuncture's maps, as it is used in Music Integrative Neurotherapy™.

Methods

My method, Music Integrative Neurotherapy™, was established starting 1978. It enclosed the principles of Chinese Medicine and Philosophy (like: the Qi, the Yin and Yang functions, the Five Elements, the concepts of P'o, Hun, Shenn, the meridian theory and their role in the action upon the organism), for that part of the method regarding both the transmission of the information from brain to organism as from organism to brain (feed forward and feedback processes).

¹⁵ Hameroff, S.R.: *Ultimate Computing*

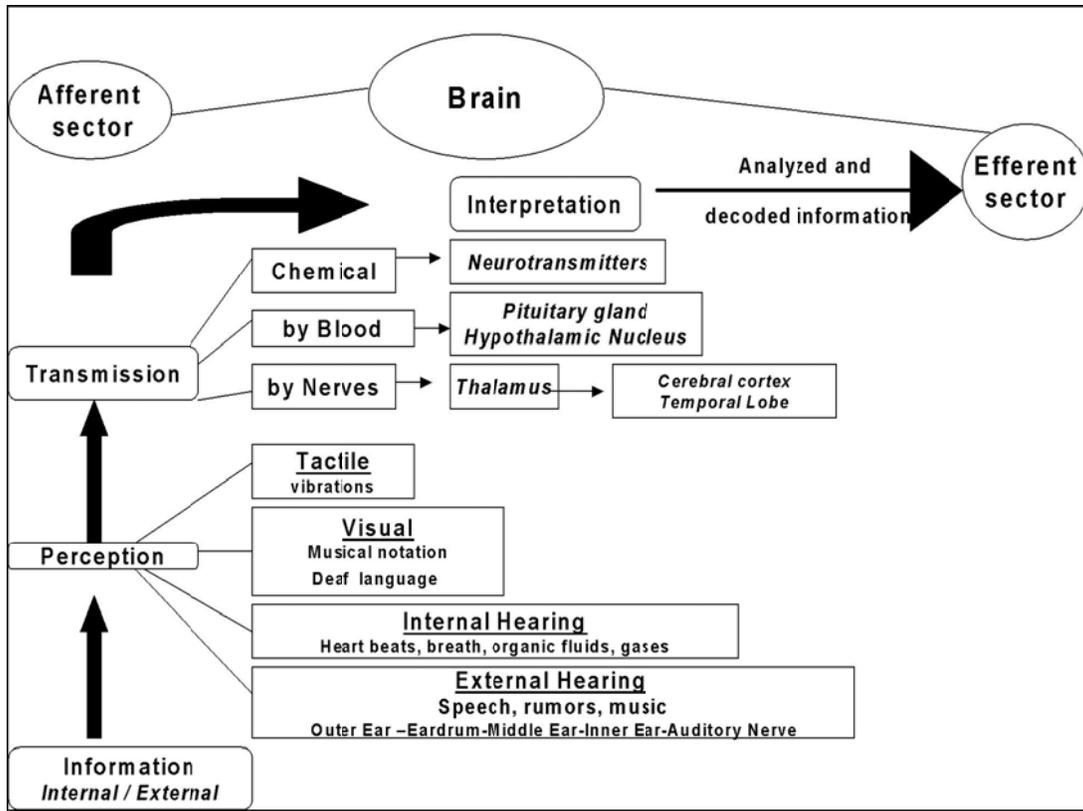


Fig. 02: Achievement of the audio information

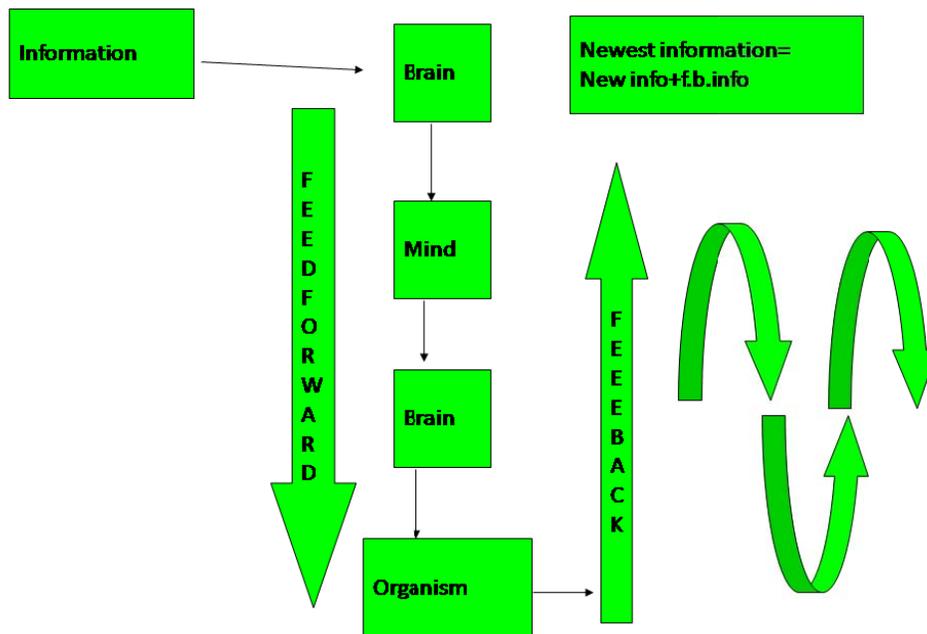


Fig.03: Feed forward and feedback process

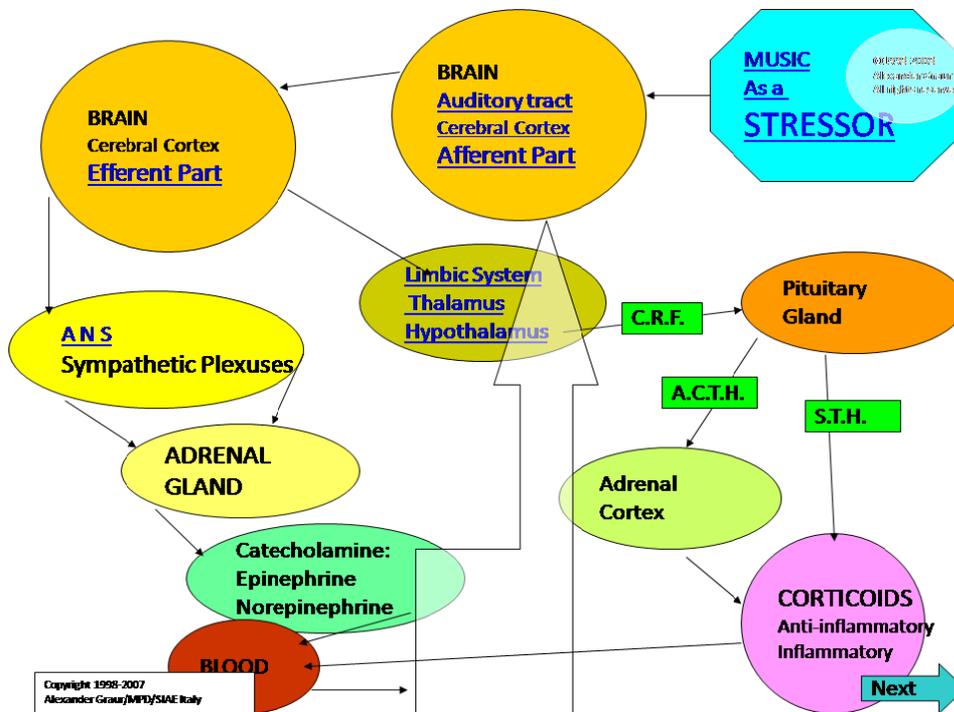


Fig. 04: The Stress Chain

The basics of the method are described in details in [16] and [17]. This method is applied mainly in psychiatric and neurological environments both in treatment as in rehabilitation; also in pediatric dental anesthesia, peri menopause, the prevention and the first phase of Alzheimer disease.

It is all computer based and imply the sound processing and the guided imagery produced by the audio waves themselves; it acts upon both the audio and visual perception and reaction centers of the brain and organism. Research demonstrates [18] that the brain's inferior pair of corpora quadrigemina forms a selective audio system, with faster and more complex reactions than the visual system.

The inferior corpora quadrigemina are connected with the reticular formation, the Cajal's interstitial nucleus and the central gray matter. The system acts directly on the CNS and ANS and, following their ramifications, on the whole body.

The audio information is received, analyzed and transmitted to the different body's systems faster than the visual information. In turn, the body's feedback at the audio information is very fast and elicits a continuous process (feed forward/feedback).

¹⁶ Graur, Alexander : *Music Integrative Neurotherapy™, Part One: Body and Sound*

¹⁷ Graur, Alexander : *"Composing for Healing - Music Integrative Neurotherapy*

¹⁸ Calo, Vincenzo: *L'Agopuntura*

Think for example at the reaction of the listeners at a dance or a ritual music rhythm: the body starts moving following the rhythm after a very short period of time, as a demonstration of the validity of the above statement. By using specific audio information to build the final musical form, the therapist/composer can plan, control and programmed the final result of the therapy, using the laws and rules of Music's Science, as they are applied in Music Integrative Neurotherapy™.

Prior to present the principles of M.I.N.T., let's see briefly what **Music** is. There are three misunderstandings regarding the concepts of Music, Therapy, and Music therapy. These common misunderstandings are:

1. The confusion between the terms **therapy** and **therapeutic**;
2. **Music is an Art only**, has nothing to do with Science;
3. **Sound is Music**.

1. **Therapy equals therapeutic.**

This is a common misunderstanding. Probably because of the common linguistic root of the two terms, the ancient Greek verb "**therapèin**"; this means "to cure, to help to cure, wellness".

Therapeutic refers to a **temporary** improvement of the presenting state of the patient.

It lasts from a very short to a short period of time and doesn't affect the causes of the illness, only some peripheral symptoms of the disturb.

For example: sometimes a warm cup of tea or a glass of wine in the evening prior to going to the bed could help to sleep better. But it did not act upon the causes of the insomnia; while mostly pleasant, the procedure it is more or less a placebo.

The same thing happened with the so called "Hyppotherapy" (horse riding), "Dolphin therapy" and alike. The effects are very short lasting and does not influence the basic disturb; they are **therapeutic**.

A real **therapy**'s effects last for a medium- long period of time, act upon the causes of the illness with certifiable medical results and are based, from the point of view of the therapist and the patient, on four conditions:

- a) To know **why** a therapy procedure is done, what is the final medical goal on doing it;
- b) To know **what** to do for to reach the purposed goal;
- c) To know **how** to do you are doing to reach the goal;
- d) To know for **how long** you have to do the therapy. A procedure that lasts forever it is not a therapy; it gives only therapeutic (i.e. temporary) effects.

Regarding the Music: musical activities are therapeutic. Music allowed people to express themselves even without the words, to communicate freely and anonymously. The bettering of the state of health is immediately clear.

Problem is that it lasts only so short in time and does not resolve the basic medical problems of the person.

Music activities are therapeutic and necessary in a treatment plan to resolve temporary symptoms.

But music can be, and it is also, a therapy.

Accomplishing the four conditions listed above and showing clear and certain results based on medical and behavioral tests, the music can be a real therapy.

2. Music is only an art.

More or less since the middle of the nineteenth century's Western culture (the Romanticism) the music is considered commonly as an "Art", an expression of a not well-defined process of "inspiration" only. This is a false opinion.

Music is, prior and above all, a science. It deals with scientific laws belonging to physics, physiology, mathematics and to the specific natural laws of the musical phenomenon itself.

The same laws are acting in the western music as in the eastern one, in the northern as well as in the southern parts of the world, exactly as the laws of any other science or human beings endeavors.

That is because these laws are aspects of the reality itself, they are not created by a human intervention. The human physiology is the same for all the races and cultures, all over the world. It is this aspect that determines the functions of the Mind, as an expression of the Brain's activity, and the similarities of the human decisions in similar situations.

One quantity plus another quantity, in the same conditions, gives two quantities. One plus one equals two even in the outer space, at least according to the common human knowledge. Music works with these kinds of laws and rules.

The stereotyped image of the artist who's looking to the moon and then sits at the piano playing with inspiration the "Moonshine Sonata" it is a false image. Between the initial inspiration and the signature of the artist at the end of the score there are various months of hard work. During this period of time the artist is applying in this work the compositional techniques based on the rules and laws of the science of music.

The science of music can be used to create a music addressing directly some pathologies; the science of music can be used to compose music as a therapy.

3. Sound equals music.

How many times did you notice people saying “we are immersed in music, the world around us is made by music”? That is a false opinion. We are immersed in sounds, not in music.

The music is made by sounds; but the sounds are NOT music.

Consider the single sound (frequency, vibration, pitch, whatever definition you want to give for this single sound), as a brick.

A pile of bricks doesn't make a building; it is still only a pile of bricks.

To have a building one should first of all know what kind of building is needed: a house, a hospital, a concert hall, whatever. Then have to draw the blueprints doing the calculations accordingly to the final goal, dig and built the ground and the structure. At this point the bricks are used; but it is not enough. The realtor has to do the plumbing, electricity, heating. Then have to paint the walls and to refurbish all accordingly to the specific destination of the building. After all this work you can just sit down and enjoy the new building.

This last moment is the Music, as we generally consider it.

Music is the science of organizing the sounds in logical structures. It is made by sounds, but it goes far beyond them, by organizing the audio material according to the laws of logic, musical grammar and syntax, aiming to the final desired effect. Music is a phenomenon developing itself in five dimensions: three are spatial, one is temporal and one is defined by the reaction of the Brain-Mind-Brain-Organism complex, regarding both the interpreter and the listener. [19] and Fig.1

This is my concept, and I am applying it either in composing music as a therapy and in my concert works.

The basic principle of Music Integrative Neurotherapy™ is that in order to really heal, the music used for therapy must be composed based on the medical data of each patient and must act beyond the psychological conditioning and cultural background of the patient.

The ultimate goal of the therapy is to transmit to the mind pre-determined information to be stored in the long term memory banks for to be used as reference for future decisions.

(Rewiring the mind to rewire the brain and organism)

¹⁹ Graur, Alexander : *Music Integrative Neurotherapy™, Part One: Body and Sound*

To reach this goal the laws of Music Science are employed to build the final musical form, the audio information as it is received by the listener/patient's brain.

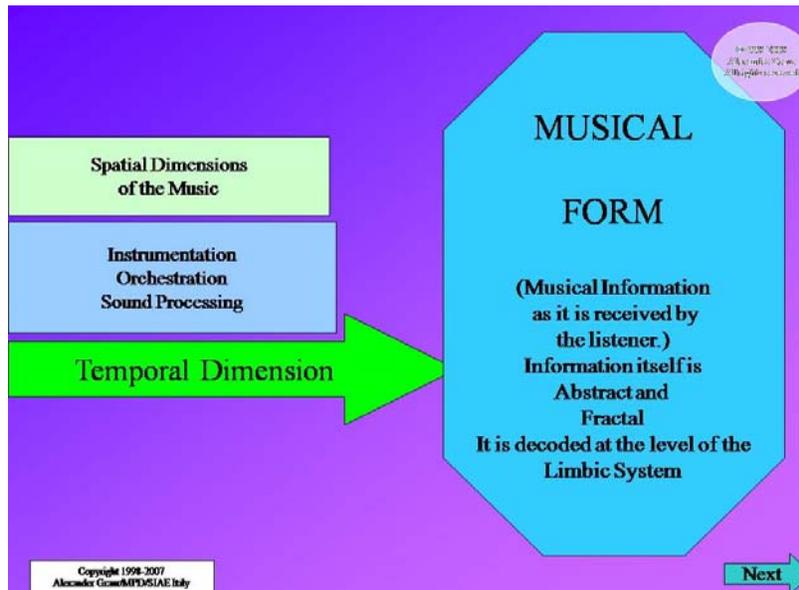


Fig.05: Final Musical Form

This information is processed by the mind, decoded and transmitted to various parts of the brain. From these centers the decoded information goes to various organs. In turn, the organs/plexuses feed the result of their reaction to this input as new information, back to the brain.

The continuous process of feed forward- feedback is piloted from start, by building the original musical material based on the patient's medical and psychological data,

This therapeutic musical and visual material elicit changes in homeostasis, feeds the programmed new information to the memory mechanism and fixed it in the long term memory banks for future reference.

As an immediate result changes in behavior and the bettering of the general health state, prevalently mental health state of the patient, are **evident and quantifiable**.

Therapy session (excerpt from [20])

Each M.I.N.T. session is divided in three parts

1. **Introductory:** The goal of the first phase is to prepare the patient to the impact of therapeutic music; it lasts between ten and fifteen minutes, according to the personality of the patient and his immediate state of mind. The values of blood pressure, pulse and respiratory rhythm taken before the session give an approximate indication about the presenting state, and determine the duration of this phase. When the respiratory rhythm (the most evident immediate sign) becomes regular the second phase could start.

²⁰ Graur, Alexander : **Music Integrative Neurotherapy™, Part One: Body and Sound**

- 2. The **second phase** contains three parts: the first addresses the class of disease (for example Anxiety); the second addresses the sub-class of disease (Anxiety, G.A.D.); the third is the therapeutic music composed for each patient. This phase lasts between twenty-five and thirty minutes, according to the type of disease and the medical condition of the patient.
- 3. The **third phase** is aimed to stabilizing the new levels of patient's homeostasis, evident in both his behavior and in the values of the tests run after the session. It last between five to seven minutes

Details: After the initial assessment session, the therapy sessions are grouped in cycles of ten. During the first three sessions the duration of time need for the first phase is longer than the duration of time used for the other two phases. Normally after three sessions, the first phase became shorter, allowing the extension of the second phase. During the session the therapist applies various methods of observation, noting the duration, frequency or the interval of patient's reactions. Also, different associate techniques (extra musical) are implied if necessary, case by case.

At the end of each session the therapist writes a preliminary report about it; at the end of the cycle of ten sessions a conclusive report is issued and presented to the referent. This report presents the details of therapy used, the reactions of the patient towards it and the termination plan.

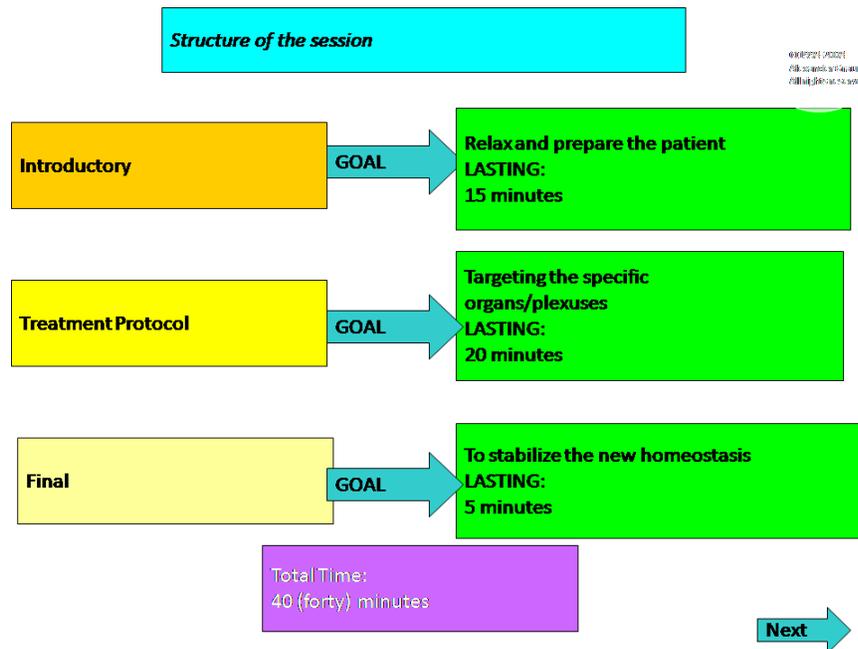


Fig.06: M.I.N.T. structure of the session

The Chinese Medicine and Acupuncture offers a well structured theory for a millenarian practice regarding the diffusion channels of biological information for the therapy. In dealing with Psychiatric Disturbs the M.I.N.T. is using the following data, based on [21]:

Five Elements	Zang	Fu	Emotional aspects	Used in
Wood	Liv liver	G Gall-bladder	anger	Manic syndrome , Schizophrenia, Paranoia, Anger NOS
Fire	H heart	SI Small intestine	Joy	Hypersomnia, manic depression, Panic attack (GAD), elation
Earth	SP spleen	S stomach	Overthinking	Stress NOS, insomnia, Schizophrenia, Depression NOS
Metal	L lung	LI Large intestine	Grief, melancholy	Manic depressive
Water	K kidney	B bladder	Fear,	Anxiety ,acute form(panic attack, GAD), Insomnia

Table 3: Five Elements, meridians, aspects and their use

The two main Eight Extraordinary Channels, **GV (Du Mai)** and **CV (Ren Mai)** with their median configuration has no connections with the internal organs. I am using their functions as reinforcement of the signals carried by the anterior and posterior channels by programming a musical structure based on the lowest and highest frequencies of: the thalamus, pituitary gland ,cardiopulmonary and solar plexuses (**GV**), solar, splanchnic and lumbosacral (plexuses **CV**). The **GV** and **CV** act as connections with the anterior and posterior meridians (connections between functions, not between organs)

A fundamental issue in therapy is the concept of **Qi**.

The existence of the Qi is demonstrated by millennia of practice. Translated in Western concepts as

Πνευμα (pneuma, [Greek] = breath, soul, spirit; the significance is “vital flow”) it is by far much more than that, because it implies also the significance of “vital energy”. [22] The Qi is a dual concept: it defines the existence of

²¹ Maciocia, Giovanni: *The Practice of Chinese Medicine*

a universal continuum of both matter and energy, permeating the body and interacting upon and inside the body. The physics of the last 20th century demonstrate the deep implications of this binomial concept of matter-energy, with the works of Einstein, Heisenberg, Schrödinger, Feynman, between others. This matter-energy doesn't originate only from outside-in, though. It originates also from inside-out and then acts from outside-in. The Qi has a cycle of twelve periods of two hours each, starting from lungs and ending in the liver :

Channel	Name	Character and origin	M.I.N.T. Basic frequencies (Hz) / Musical notes (b= flat #=sharp)
1	L lung	Much Yin, lung	[1700.5+1760.0+1785.0) ± A
2	LI Large intestine	Yang, hand	[42.0...44.9]+[85.0...88.9] ± F
3	S stomach	Yang, foot	1380.6+1396.9+1425 ± Fb
4	SP spleen	Much Yin, foot	[5360.0...5700] ± F#
5	H heart	Less Yin, hand	[27.5...28.8] + [53.0...56.0]+ [106.7...112.5]+ [218.3...221.5]+[432.0...444.0] ± Ab/A/A#
6	SI small intestine	Much Yang, hand	[170.0...179.0]+[335.0...355.0] ± E#
7	B bladder	Much Yang, foot	[318.0...331.0]+[1295.0...1335.0]+ [2580.0...2690.]+[5160.0...5380] ± Eb/E
8	K kidney	Less Yin, foot	[40.5...42.0]+ [79.0...85.0]+[160.0...168.0] ± E
9	P pericardium	Yin, hand	[47.8...49.5];+[95.0...99.4]+ [860.5...895.0]+[3480.0...3600] ± G#/Ab
10	TE triple energizer	Less Yang, hand	[4040.5+4125.0+4186.0] ± C + [7700+7800+7902] ± B + [1540+1568+1598] ± G
11	G gall-bladder	Less Yang, foot	[680.5...703.6];+[335.0...355.0]+ [95.0...99.4] ± F##/±G
12	Liv liver	Yin, foot	[47.8...49.5]+ [95.0...99.4] ± Gb

Table 4: The Qi cycle and frequencies

²² Calò, Vincenzo: *Manuale teorico pratico di Agopuntura*

Note 1 to Table 4: in programming the therapy session a therapist must take in consideration this cycle in order to administrate the right M.I.N.T. therapy piece (the general protocols of therapy plan this in the second part of the session).

Note 2 to Table 4: the musical notes are presented in a denomination belonging to the tonal system, in today's world the most known musical system. That's why some alterations appear in their double aspects (##).

I would like to briefly mention another interesting aspect of the Chinese Medicine and its similarities with the Western Medicine, an aspect that I am using successfully in the therapy. The first to write about this aspect was the Italian physician and acupuncturist Vincenzo Calò [²³].

Calò, considering the fundamentals of the MacLean's theory of the Triune Brain [²⁴] made an analogy with the three stages considered by the Chinese Medicine: the emotional and intellective functions **P'o**, **Hun** and **Shenn**. According to MacLean the actual human brain is the result of the evolution in time of the mammals.

At the core of the brain is the R-complex, the **proto reptilian brain**. It is responsible of the four F's: feeding, fighting, fleeing and reproduction; which are reflexive and instinctive behaviors necessary for survival, of the individual and species. The proto reptilian brain is at the center of gene replication and body's survival.

The **hypothalamus** is the main component of the R complex, responsible of regulation of the endocrine and autonomic nervous systems; also parts of the proto reptilian brain are: the striatal complex, basal ganglia and great part of the olfactory system.

The second part of the brain is the **paleomammalian** brain. It is made by the limbic system: the limbic lobe and connecting brainstem structures. The paleomammalian brain is responsible for learning, memory, emotion, visceral regulation. It integrates information from outside and inside the body, including audio and vocal communication. It is decisive in behavior and transmitted (learned) behavior.

The third part of the brain is the **neomammalian** brain. It is made by the neocortex and connected thalamic structures. Its functions are related to the perception of the external environment; in humans also with consciousness (self awareness), introspection, language and planning.

The neomammalian brain is responsible for complex stimulus analysis, variable and learned aspects of motor control and abstract (rational) thought.

²³ Calò, Vincenzo: *L'Agopuntura*

²⁴ MacLean, Paul: *"The Triune Brain in Evolution: Role in Paleocerebral Functions"*

Many of the deductions of MacLean were denied by the contemporary research, but not the fundamentals of his theory of triune brain. The stages regarding the formation of the brain in the human fetus are the most evident proof of this theory.

Classical Chinese Medicine principles of P'o, Hun and Shenn are compared by Calò with the triune brain in this order: the proto reptilian brain with P'o; the paleo mammalian brain with Hun; the neomammalian brain with Shenn. The description of their physiological and psychological functions is identical in the Chinese Medicine and in the Western anatomy and physiology, even with different words (terms).

The deepest level, **P'o**, has a Yin character; it is manifested in the lungs. Its Herald is **CV 17**: it regulates excess of Anxiety and Aggressive (Manic Syndrome). It could be regulate by acting on **Liv** and **G** channels.

The **S 25** transform the Yang energy in Yin (blood) energy. This point is the connection between P'o and Hun.

The P'o acts also, according to the classical concept, on the sexual attraction through the **K** channel.

(the fourth F's of triune brain concept).

The middle level, **Hun**, is called the Three Memories level. It is responsible mainly for the memory, dreams and sexuality. It is manifested in **Liv**, acts on memory in **H** and relates to P'o in **S 25**.

The third level, **Shenn**, has a strong Yang character; it is the highest level of intellective function, the human consciousness. It is responsible for reasoning, the perception of the whole environment and the active memory mechanics. The last function been connected with the Hun level (proto memory, or long term memory; at this level are stored also the meme [²⁵]).

The classical definition of Shenn is "the one which defines the opportunities offered by the real world" [²⁶], which is what the triune brain theory call consciousness (self awareness) and rational thought.

M.I.N.T. use this three intellective and emotional levels in all the therapy material.

For example in Bipolar II Disorder, Manic Syndrome: from Thalamus/solar plexus/ **CV** general to **Hun /Liv** through **S 25**.

²⁵ Graur, Alexander : *Music Integrative Neurotherapy™, Part One: Body and Sound*

²⁶ Maciocia, Giovanni: *The Practice of Chinese Medicine,*

S 25 is sited about a third of the distance from **Liv** to **Thalamus** (from +/- A to +/- D); the passage is obtained with a transit sequence, musical centers **A →Ab →G→ D** (in music language is called a **modulator passage or tono-modulation**),using the frequency values of Liver- Heart-Triple Energizer.

Similar musical techniques are used in order to compose and deliver the therapy material in all the disturbs in which Music Integrative Neurotherapy™ is useful.

Procedures and Results

The general structure (protocol) of the M.I.N.T. session in Mood and Personality Disorders:

1st Part

1.1. Well (Thalamus) **listen to ex.08**

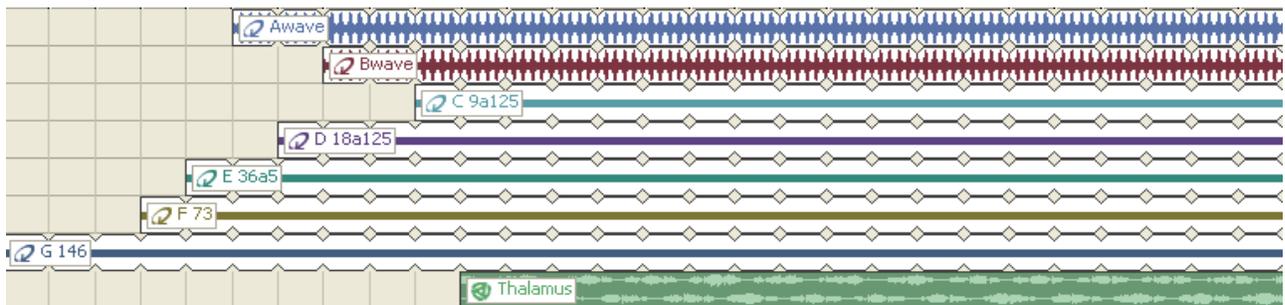


Fig.07: Well (Thalamus) Score (fragment)

1.2. NOS for the class of disturbs (NOS= Not Otherwise Specified= general aspect of a disturb)

2nd Part

- 2.1. Dispersion, cycle: L (lung) →Liv (liver)→[patients specific]; including Ren Mai **listen to ex.09**
- 2.2. Personalized 1: specific for the patient's disturb
- 2.3. Personalized 2: specific for the Qi cycle, class and gender of disturb, patient's personal reactions

3rd Part

Tonification , including Du Mai **listen to ex.10**

Clinical case 1: Depression

Audio, Clinical Case Depression. Use: second part of the session (dispersion) Listen to ex. 11

Patient: R.B. male 54 y.o, business manager

Primary diagnosis: Bipolar II ([10²⁷] 296.89)

Secondary diagnosis: OCD ([10] 300.3)

Main drug treatment: Zyprexa (olanzepine), 2x75 mg/day

Number of M.I.N.T. sessions: 8 (2/week / 1 month)

Therapy for the patient's Manic Depressive Episode:

Target (in order):

Thalamus/Thymus/Cardiopulmonary Plexus/Solar Plexus/Splanchnic Plexus/Lumbosacral Plexus

Use: second part of the session (dispersion)

Audio frequency range: 40.5Hz...to 4698 Hz (+/- E to +/- D)

Amplitude range: -6dB

Musical form: A (a-b-a') – B (c- b'-c') – A' (a'- b''-c'') - Coda (a)

Orchestration : organ + flute+ unpitched percussion + pitched percussion+ environmental sounds

Sound's panoramic:

Center: Rear -25

Front: L -60/R +60

Rear: L+100/R +100

Acupuncture: [Thalamus + GV] → [Liv by H → K → S + CV]

Results: improved personal and social behavior after the third session; reduced bipolarity onset (longer period of time between the Depressive and Manic Episode). Results last for about three month after the cycle of M.I.N.T. therapy (family physician's statement).

Also from the therapy material for this patient:

Audio, Clinical Case Depression. Use: third part of the session (tonification) Listen to ex. 12

²⁷ 10=Diagnostic and Statistical Manual of Mental Disorders- DSM – IV- TM

Clinical case 2: Schizophrenia

Audio, Clinical Case Schizophrenia. Use: third part of the session (tonification) Listen to ex. 13

Patient: A.M., 45 y.o., female, housewife

Primary Diagnosis: Schizophrenia, Disorganized Type ([10] 295.10)

Main drug treatment: Zyprexa, 225 mg 1/day; Depacote, 400mg 1/day

Number of M.I.N.T. sessions: 10, 1/week for 10 weeks

Therapy for this patient:

Target (in order): Thalamus/ Thymus/ Pituitary gland/ Kidneys/ Cardio-pulmonary plexus

Use: third part of the session (Tonification)

Audio frequency range:

Amplitude range: -8 to -6 dB

Musical Form: A (a-b-c) - B (a'-b'-c')

Orchestration: synthesizer + pitched percussion

Sound's panoramic:

Center: Rear -25

Front: L -60/R +60

Rear: L+100/R +100

Acupuncture: [Thalamus+ GV] → [LI+ SI+ SP+K]

Results: Initial akathisia (restlessness + anxiety) highly diminished. Increased social functioning. Communication visibly improved. Self awareness improved.

Also from the therapy material for this patient:

Audio, Clinical Case Schizophrenia. Use: second part of the session (dispersion) Listen to ex. 14

Clinical case 3: Insomnia

Audio, Clinical Case Insomnia. Use: second part of the session (dispersion). Listen to ex. 15

Patient: G. N., 62 y.o. male, CEO insurance company

Primary diagnosis: Acute Stress Disorder ([10] 308.3)

Secondary diagnosis: Sleep disorder due to GMC ([10] 780.52)

Main drug treatment: Methyprylon (glutethimide); Meprobamate (quantity not disclosed).

Number of M.I.N.T. sessions: 6, 2/week,/three weeks

Therapy for this patient:

Target (in order): Thalamus/Pituitary gland/ Cardiopulmonary plexus/ Solar plexus/ Splanchnic plexus

Use: second part of the session (dispersion)

Audio frequency range: 47.8...49.5 Hz to 4698.00 Hz (G...D).

Amplitude range: 0 to - 6.5 dB

Musical Form: Field Heterophony : $f_{x,y}\{[(x_1y_1x_2)(y_2x_2y_1)][(x_2y_2x_1)(y_1x_1y_2)]\}$

Orchestration: synthesizer, Pan flute, pitched percussion

Sound's panoramic:

Center: Rear L -75

Front: L +100/ R -50

Rear : L +50/ R -100

Movement: helix out/in

Front R- Rear L- Front L- Rear R- Center

Acupuncture: [Thalamus + GV] →[SP- GB]→[H + K]

Results: improved quality and quantity of sleep. Resulting increased capacity of concentration and bettered social behavior. Results last for about 9 weeks.

Discussion

In this chapter I present the general protocols of therapy for specific class of disturbs and statistics of results based on hundred patients. The research has been done in public and private clinics in Italy and USA, between 1998 to 2004. The funding was all private.

General protocol of therapy for Depression

Target

Thalamus / Thymus / Pituitary gland

Cardio-pulmonary plexus / Solar plexus

Lumbosacral plexus

Material: musical

Audio frequency range: 36.708 Hz to 4698.00 Hz (D...D).Favorite registry: 2nd and 7th

Amplitude range: -12 dB to -3 dB

Musical form (order of importance): 1. Binary composed; 2. String Heterophony; 3. Ternary simple; 4. Ternary composed; 5. Field Heterophony
Orchestration (order of importance): Strings; Woodwinds; Harp; Percussion (pitched); Piano; Percussion (unpitched); Voices (single/ mixed choir)
Sound panorama: always starting from Center to Front, to Rear then to Center, and repeat. In some cases, alternating L/R to R/L (starting with the weakest ear)
 Delay time: between 0.04 to 0.10 seconds

Material: visual

Color frequency range: Red (0.65 - 0.60μ) to Violet (0.43 - 0.40μ)
Imagine: Abstract (order of importance): Helix; Sphere (rotating); Concentrating particles.

Number of sessions

Initial: 10 to 16
 Maintenance: 3 to 5 after 3 month

Acupuncture: [Thalamus + GV] → [Liv by H → K → S + CV]

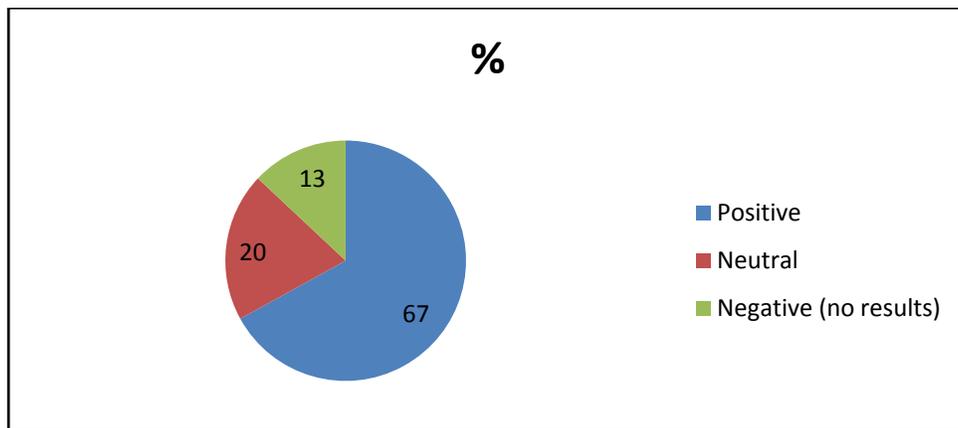


Fig. 08: Statistics in Depression

General protocol of therapy for Insomnia

Target

Thalamus / Pituitary gland/ Cardio-pulmonary plexus / Solar plexus/ Thymus

Material: musical

Audio frequency range: 47.8...49.5 Hz to 4698.00 Hz (G...D).Favorite registry: 1st and 6th

Amplitude range: -20 dB to -5dB

Musical form (order of importance): 1. Field Heterophony; 2. String Heterophony; 3. Ternary simple; 4. Ternary composed; 5. Binary composed

Orchestration (order of importance): Strings; Piano; Harp; Woodwinds; Brass; Percussion (pitched); Voices (single/ mixed choir); Percussion (unpitched);

Sound panorama: center- back- right-left

Material: visual

Color frequency range: Blu (0.49 - 0.45μ) to Ultraviolet (0.40μ...)

Imagine: Abstract (order of importance): Concentrating particles; Helix; Sphere (rotating);.

Number of sessions

Initial: 15 to 20

Maintenance: 5 to 7 after 4 month

Acupuncture: [Thalamus + GV] →[SP- GB]→[H + K]

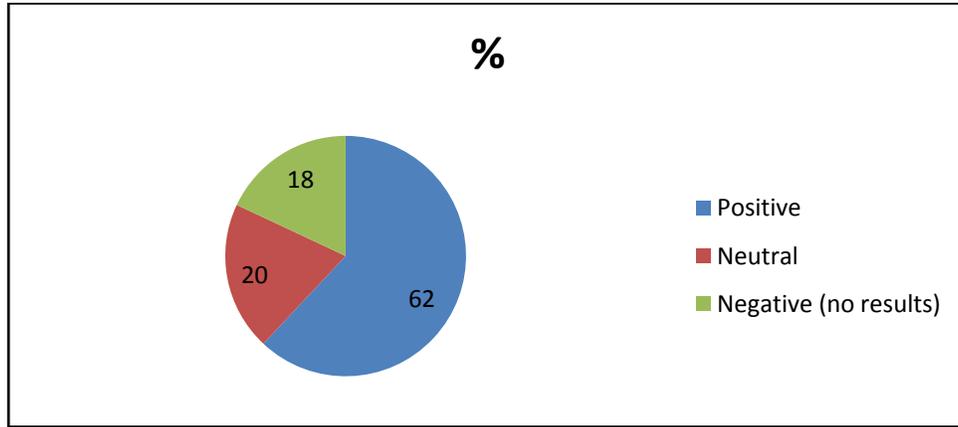


Fig.09: Statistics in Insomnia

Another example, multimedia file (the usual way of deliver for M.I.N.T.)

Audio+video example for Insomnia NOS (watch ex.16)

General protocol of therapy for Schizophrenia

Target

Thalamus / Hypothalamus/ Pituitary gland/Thymus/Cardio-pulmonary plexus/Solar plexus
Lumbosacral plexus

Material: musical

Audio frequency range: 36.708 Hz to 4698.00 Hz (D...D).Favorite registry: 2nd and 7th

Amplitude range: -12 dB to -3 dB

Musical form (order of importance): 1. Binary composed; 2. Ternary simple; 3.; Ternary composed 4.Sonata; 5. Field Heterophony; 6. String Heterophony

Orchestration (order of importance): Organ; Keyboards; Harp; Full orchestra, Percussion

Sound panorama: Alternating L/R to R/L (starting with the weakest ear)

Delay time: between 0.10 to 0.15 seconds

Material: visual

Color frequency range: Red (0.65 - 0.60μ) to Violet (0.43 - 0.40μ)

Imagine: Abstract (order of importance): Fractal structures; Concentrating particles.

Number of sessions

Initial: 15 to 20

Maintenance: 4 to 5 after 2 month

Acupuncture: [Thalamus+ GV] → [LI+ SI+ SP]

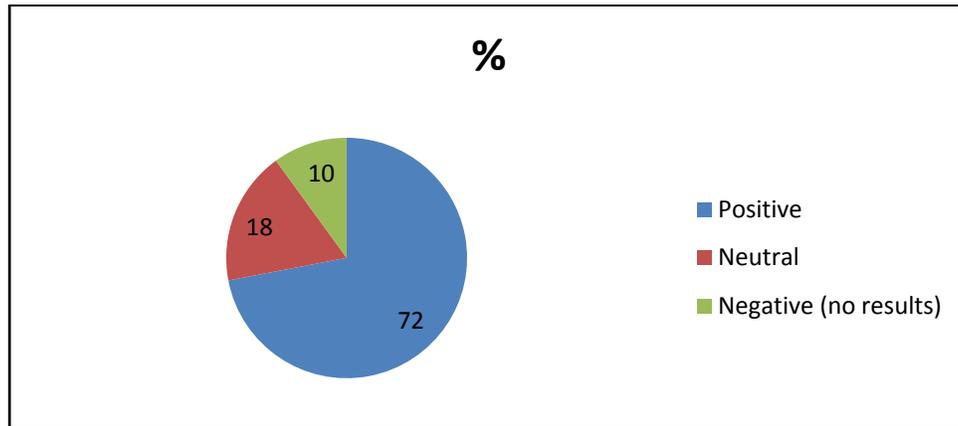


Fig.10: Statistics in Schizophrenia

Conclusions

1. The map of channels, meridians and points used in Acupuncture can be used for the transmission to desired targets in the organism (organs, plexuses, functions) of an audio information for therapy specially composed based on the medical data of the patient;
this is another testimony about the real existence, functioning and effectiveness of Chinese Medicine's principles;

2. Music Integrative Neurotherapy™, by using the principles of Acupuncture in the process of feed forward/ feedback of the audio information, can reduce the side effects of the drug treatment, speed up the main effect of drugs and obtain time lasting positive results;

3. The collaboration between acupuncturists and M.I.N.T. therapists in Mood, Personality and Sleep Disorders could obtain faster and better results by acting in the neurophysiologic and neuropsychological processes, even in the Western medicine fields and conditions of application.

3. Final note about therapy: we must consider the fact that in the Western world all the patients are taking chemical medication for all disturbs and their side effects. That means the average functions of the organism are altered, both by disturb and the treatment. The complementary medicine, including the Acupuncture and M.I.N.T. interventions in the Western world, must take count of this reality and act accordingly.

Adjustments of the basic procedures have to consider, together with the presenting state of the patient:

- The class and type of the ongoing drug medication

- The specific mechanic of the action/effect of the drug involved (how and where it acts and the side effects),
- Patient's etiology and drug treatment history.

This is by far much more important in treating the psychiatric disturbs, the drug treatment of which it is often contradictory if not over delivered, with multiple side effects.

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Example #	File name	Web link
Ex. 01	Awave	http://medicamus.com/acupuncture/01%20Awave.mp3
Ex.02	Bwave	http://medicamus.com/acupuncture/02%20Bwave.mp3
Ex.03	Cwave	http://medicamus.com/acupuncture/03%20Cwave.mp3
Ex.04	Dwave	http://medicamus.com/acupuncture/04%20Dwave.mp3
Ex.05	Ewave	http://medicamus.com/acupuncture/05%20Ewave.mp3
Ex.06	Fwave	http://medicamus.com/acupuncture/06%20Fwave.mp3
Ex.07	Gwave	http://medicamus.com/acupuncture/07%20Gwave.mp3
Ex.08	Well Thalamus	http://medicamus.com/acupuncture/08%20Thalamus%20%20well.mp3
Ex.09	Acupuncture 2 dispersion	http://medicamus.com/acupuncture/09%20Acupuncture%20%20%20Dispersion.MP3
Ex.10	Acupuncture 1 Tonification	http://medicamus.com/acupuncture/10%20Acupuncture%201%20tonification.MP3
Ex.11	<i>Clinical Case Depression dispersion</i>	http://medicamus.com/acupuncture/11%20depression%20dispersion.mp3
Ex.12	<i>Clinical Case Depression tonification</i>	http://medicamus.com/acupuncture/12%20depression%20tonification.mp3
Ex.13	<i>Clinical Case Schizophrenia tonification</i>	http://medicamus.com/acupuncture/13%20schizophrenia%20tonification.mp3
Ex.14	<i>Clinical Case Schizophrenia dispersion</i>	http://medicamus.com/acupuncture/14%20schizophrenia%20dispersion.mp3
Ex.15	Clinical Case Insomnia	http://medicamus.com/acupuncture/15%20SDI%204.mp3
Ex.16	<i>Insomnia NOS</i>	http://www.youtube.com/watch?v=yeHX0ReaxSE

Authors' contributions

I hereby state that I am the sole author of this paper and enclosed figures, tables, audio and video files.

Competing interests

There are no competing interests