School for ® INNER SOUND

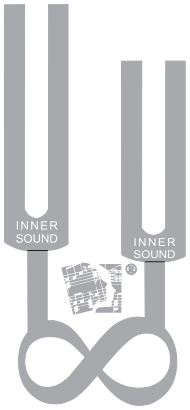
International Practitioner Training

Tuning Forks - CERTIFICATION

CERTIFICATION

BASIC & ADVANCED

INNER SOUND TUNING FORKS



School for ® INNER SOUND

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Tuning Forks - CERTIFICATION

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BASIC CERTIFICATION

CERTIFICATION REQUIREMENTS
INNER SOUND Tuning Fork Practitioner- Basic

(NO DEADLINE FOR COMPLETION)

1. Answer **INNER SOUND** Basic Exam questions on pages 71-75 of the Basic Student material.
2. Answer study questions for "How Sound Heals" on pages 3-11 of this manual.
3. Document on another person the following: 20 sessions each of a Basic Short / Basic Long- 3 sessions each with at least 2 people. (You can use just 2 people for all 40 sessions or 2 people for the 6 sessions and another 34 separate individuals or any combination for the other 34 sessions.)
4. Document on another person 10 sessions using the appropriate Matrix pairs for desired theme or goal. (These can be done during a Basic Short or Basic Long session.)
5. Document on self: 20 Basic Long sessions+10 applications of Matrices.
6. Complete technique exam (See next page for guidelines), oral interview with review of written exam.

Submission guidelines:
Contact Arden Wilken, arden@innersoundonline.com,
to schedule technique exam & oral interview.
Email the items listed below to
info@innersoundonline.com

1. All Basic Long and Basic Short Session forms for others, including the Matrix pairs. Include reason for choosing the Matrix, whether Rings of Sensitivity are present, any verbal feedback, and the client assessed stress & pain ratings before and after the session. Include a brief summary of your experience using tuning forks with others. For privacy reasons use initials or a numbering code for each individual.
2. The Basic Long + Matrix Session forms for you. Include a brief summary of your overall experience.
3. Answers to the study questions from "How Sounds Heals" on pages 3-11 of this manual.
4. **INNER SOUND** Basic Exam questions.

Cost of certification: $150

Keeping active and up to date- every 4 years
1. Retake 1 day of Basic course. (Cost: 1/2 of current price.)
2. Retake any previously taken INNER SOUND course (optional) at ½ current price.

TUNING FORK PRACTITIONER – Technical Exam Guidelines

The technical exam is treated as a 'mock' session i.e. the student conducts the session as if it were a real one from beginning to end. The assessment is not simply to observe the accuracy and application of a Basic Long sequence; students are also assessed on how they interact with the client, and how professional they appear. Unless special arrangements ahead of time are made, the tuning fork session for the Technical Exam is a Basic Long with a 10 second activation, crossing Pairs 9, 5, 3, & 1 when descending.

SPECIFIC THINGS WE LOOK FOR:

1. Is the explanation about the tuning fork session to the client clear and accurate?
2. What is said about the effect of the tuning forks and what to expect from a session? (For example, you can use the colored literature to explain the effect of the forks, you can use the FAQs, or you can also just explain about the tuning forks, the session, and what to expect in a few words. Be clear and concise, referring to your notes or the literature, if needed, but not reading from them. Accuracy counts more than quantity.)
2. Does the student ask the client about the level of stress or pain on a scale of 1 to 10 before starting the session?
3. Does the student ask the client if it is OK to be touched on the shoulder or arm....., if necessary, to come back to the outside world after the session?
4. The different aspects of technique we are looking for are as follows:
   a. Anatomically neutral posture/Body position in relationship to client and table
   b. Are the tuning forks held correctly with relaxed thumbs, wrists and arms?*
   c. Is the correct activation sequence used- lowest frequency fork first always, even on the crossings?
   d. Is testing done with Pairs 1, 5 & 12?/What is said to the client about the testing?
   e. Does the student fade the forks in and out at the ears with each pair?
   f. Are the pairs applied with a consistent rhythm?
5. Is the client given enough time to come back after the session? (In the case of this exam, only one minute is sufficient.)
6. Is the client given the opportunity to give feedback (brief) after the session? (Avoid the use of 'how' questions such as, "How was that?" Use instead, "What did you experience?" or "What do you feel". These help to avoid long commentaries that can be difficult to stop.)
7. Is the client asked about each individual over-activation symptom?
8. Is the client asked about stress or pain levels on a scale of 1 to 10 after the session?

*This is the most common problem students have in the technical exam. Think about and practice your thumb joint being up instead of down or flat. Notice the difference between the two in the tension you feel in your hands, arms and body and how you activate the tuning forks.

SECTION 2
HOW SOUND HEALS

Section 2

How Sound Heals

Objective of this section:

To learn about the following in relationship to how sound heals:
1. Physics of sound
2. Effect of sound on the biological functions of the body
3. Effect of sound on the physiology of the body
4. Effect of sound on the nervous system (Psychoacoustics)
5. Theory and function of emotions
6. Effect of sound on the emotions
7. Field theory
8. Acoustic and electronically produced sounds
9. Where different instruments resonate

(Words in italics are found in the glossaries at the end of many of the above areas.)

The information in this section will enable you to understand and be able to explain to your clients and prospective clients how sound can effect change in the human organism

Music to use while studying: Sound Touch and Inner Sun

1. *Physics* of Sound

Vibration
There is no sound without vibration. Vibration is when an object moves alternately in 2 opposing directions. Some examples of vibrating objects are a swinging pendulum, a plucked guitar string, or a waving flag. Anything that has mass can vibrate. This includes everything from our planet itself to the smallest particle. The vibration will also move away from the vibrating object (source) and through whatever medium it is in, whether that is air, any other gas or liquid. Sound cannot be heard in a vacuum.

When we pull the string back on a bow, this can be seen as creating the potential for the string to vibrate. When we release it, it will first move in the direction of the bow and then move back towards its previous position and then change direction again back towards the bow again, and so on. This is an oscillating movement (vibration), which diminishes in strength or amplitude with each cycle.

Before discussing how sound affects the body or how a sound healing can take place it is necessary to first know about sound itself. In a discussion of an image words like brightness, contrast, color, and shape would be used to describe it. The nature of a particular sound can be described in terms of ***frequency*** and ***pitch***, and loudness and quality or ***timbre.*** Pitch and frequency are related in that as the pitch goes up the frequency goes up and visa versa. Frequency is a physical measurement of quantity whereas pitch is a subjective characteristic. Scientists measure frequencies with instruments that give specific numbers whereas pitch is a relative characteristic that is judged automatically by the ear. The ear can be trained to determine pitches with pinpoint accuracy.

Optional experiment: Stretch a piece of wire or guitar string, for example, between 2 blocks of wood that are mounted on a stiff base. Make a wedge shaped piece of wood that is a little higher than the height of the blocks and place it under the string. Pluck the 2 strings and move the wedge in the direction of the lower pitch until the 2 sound the same. The midpoint of the string will be determined. In this way the ear will determine the midpoint auditorially with more accuracy than will the eye visually. This illustrates that the ear is much more accurate than the eye in perceiving the length of the strings.
(Figure 1)

Figure 1

Loudness needs some explanation in the sense of understanding its characteristics. Loudness is the subjective measurement of sound pressure levels (SPL) that arrive to the eardrum. Scientists measure SPL with an instrument. This gives us an absolute measurement for what we subjectively perceive as loudness. Quality or timbre is what distinguish sounds of the same frequency and loudness that are produced by different musical instruments. This will be explained more fully later.

Now that we know these specific characteristics it is now possible to investigate the physical nature of sound. Musical and non-musical instruments are used to create sounds used in therapeutic and healing work. Almost every instrumental sound consists of a combination of the actual note sounded and a number of higher tones related to it. The actual note played is the ***fundamental***. The higher tones are ***overtones*** of the fundamental. The fundamental and overtones together are what are called 'harmonics'. When discussing harmonics, sometimes the word '***partial***' is also used, though often incorrectly. It is a synonym for 'overtone', but not for the word 'harmonic'. So, the fundamental is the first harmonic and the second harmonic is the first overtone or first partial. For example, when a violin string produces a note, the string vibrates as a whole and produces the fundamental. But the string also vibrates in separate sections at the same time. It may vibrate in two, three, four, or more parts. Each of these vibrations produces an overtone of higher frequency and pitch than the fundamental. The frequencies of the overtones are whole number multiples of the fundamental frequency. These whole number ratios are the frequency of the fundamental times 2, 3, 4, 5, 6, 7 etc, for as many multiples as there are harmonics. These whole number ratios of the overtones are known as the ***linear harmonic spectrum***. Almost all wind and string instruments exhibit the linear spectrum.

Instruments such as drums, bells, xylophone, tympani and similarly struck instruments as well as the Australian Aboriginal instrument, the didgeridoo, and Tibetan and crystal bowls are examples of a ***nonlinear harmonic spectrum***. The ratios of the overtones to the fundamental are not expressed as whole numbers. Also, the frequency that our ears choose as the pitch of the sound may not be the fundamental. In these sounds it is also possible that our ear is unable to discern any pitch.

The number and strength of the overtones help determine the characteristic sound quality or timbre of a musical instrument. For instance, a note of the flute sounds soft and sweet because it has only a few weak overtones. The same note played on the trumpet has many, strong overtones and thus seems powerful and bright. It is the relative volume of the overtones that create the distinctiveness between the instruments. In the case of the violin the first 3 overtones are lower in volume than the next 4. In the case of the flute, the overtones progressively diminish and they do not go out very far, only 4-5 overtones. With the violin at least 14 or 15 overtones can be heard.
(Figure 2)

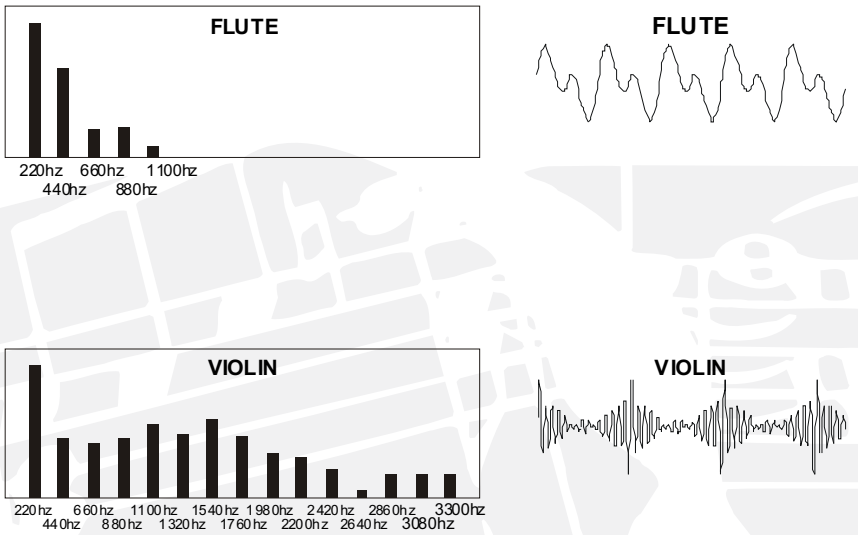
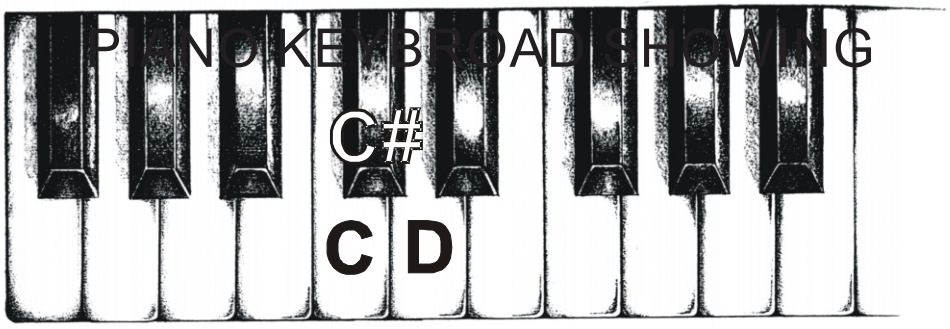


FIGURE 2 SECTION 2

The quality or timbre of an instrument is often referred to as the ***tone*** of the instrument. This is also true for the voice. When we say the tone of voice used by a person in a specific situation we are referring to the quality or timbre in this case. In the voice harmonics create vowel sounds and the different tone qualities that separate the sound of one voice from another. All sounds with strong, high harmonics are often called resonant or rich in quality and sounds with relatively low harmonics are uninteresting.

As mentioned above, the word 'tone' in physics is the color or timbre of the sound. In music it refers to the distance between notes in a scale. A synonym for 'tone' in this context is ' a whole step'. In western music the distance between each of the 12 notes used to make up different scales is a half step, half tone or semi-tone. From these 12 notes, different ones are used. Sometimes notes next to each other are used, a semi tone apart, and sometimes a note is skipped. In this case the distance between the notes is a whole tone. For example, the interval between the notes C and D on a keyboard is called a whole tone. The interval between the notes C and C Sharp (C#) on a keyboard is a half tone or semitone. (Figure 3)



HALF and WHOLE STEPS

DISTANCE BETWEEN “C” and “D” = 1 WHOLE STEP
DISTANCE BETWEEN “C” and “C#” = 1 HALF STEP

Figure 3

These tones and half tones can all be described as a particular frequency and represented by a number. The word 'frequency' sounds like something dry and scientific, but it is present in daily life. For example, the frequency with which you brush your teeth can be described by a specific number of occurrences that happen in a specific period of time such as a day. However, this frequency is much too slow to be heard. It must happen many times within 1 second for it to be heard. A simple back and forth movement reoccurring at 20 or more times in one second is enough for us to resister the presence of a sound.

Waves

Waves are caused when something disturbs a medium. A rock dropped into a still pond sets water waves in motion. The rock is called the source of the waves. When you move the free end of a rope, you become the source of the waves on the rope. If you move the rope high and low, you will make large waves. Scientists call the top part of any wave the crest, or peak and the bottom part of the wave the trough. The height of a crest above the level of the rope when no waves are moving on it is called the amplitude of the wave. Amplitude can also be measured from the bottom of the trough to the still rope.

Some waves transport energy through matter by causing the matter to vibrate. There are two types of such waves. Transverse (crosswise) waves cause the tiny particles that make up matter to vibrate at right angles to the direction of the waves. An example of a transverse wave is a wave on the surface of the ocean where the actual movement of the molecules is up and down. Longitudinal (lengthwise) waves cause the particles to "ripple" in the same direction as the waves. Sound waves as they travel though a liquid or a gas are longitudinal waves creating ***compression*** and ***rarefaction***. A vibrating tuning fork, for example, sends out ripples of parallel waves through the air. (Figure 4)

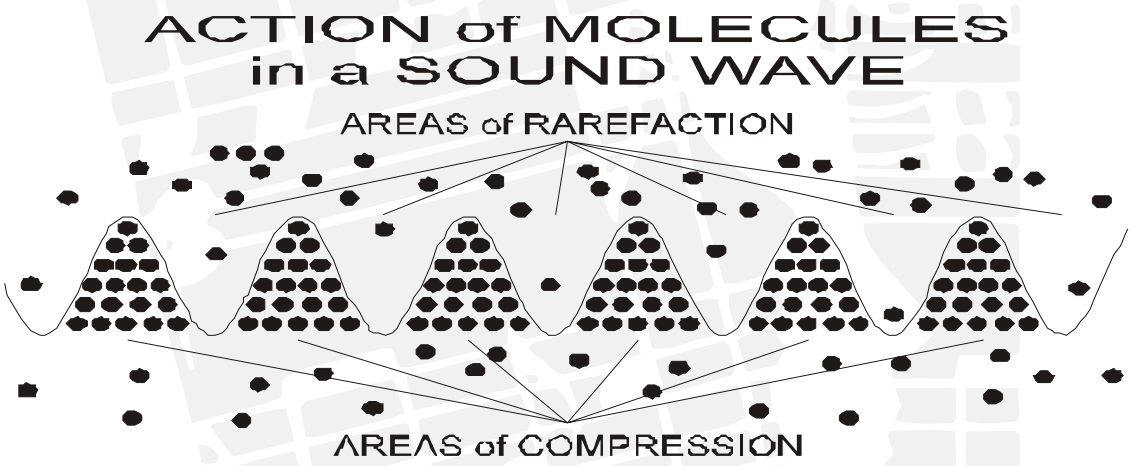


FIGURE 4 SECTION 2

The interaction of 2 waveforms of the same frequency coming together or combining is called constructive if compressions coincide with compressions and rarefactions meet rarefactions- this will happen only if the ***phase*** relationship between the 2 waveforms is the same. 'Phase relationship' means that they start their oscillation at the same time. The waves reinforce each other, producing a louder sound. The interference between the waves is destructive if compressions coincide with rarefactions. In this case the 2 waves will be out of phase. One will be starting while the other one is ending. A weaker sound or silence results. Because of the slight difference in wavelength, periods of constructive and destructive interference alternate, and the loudness of the sound increases and decreases, thus producing ***beats.*** (Figure 5)

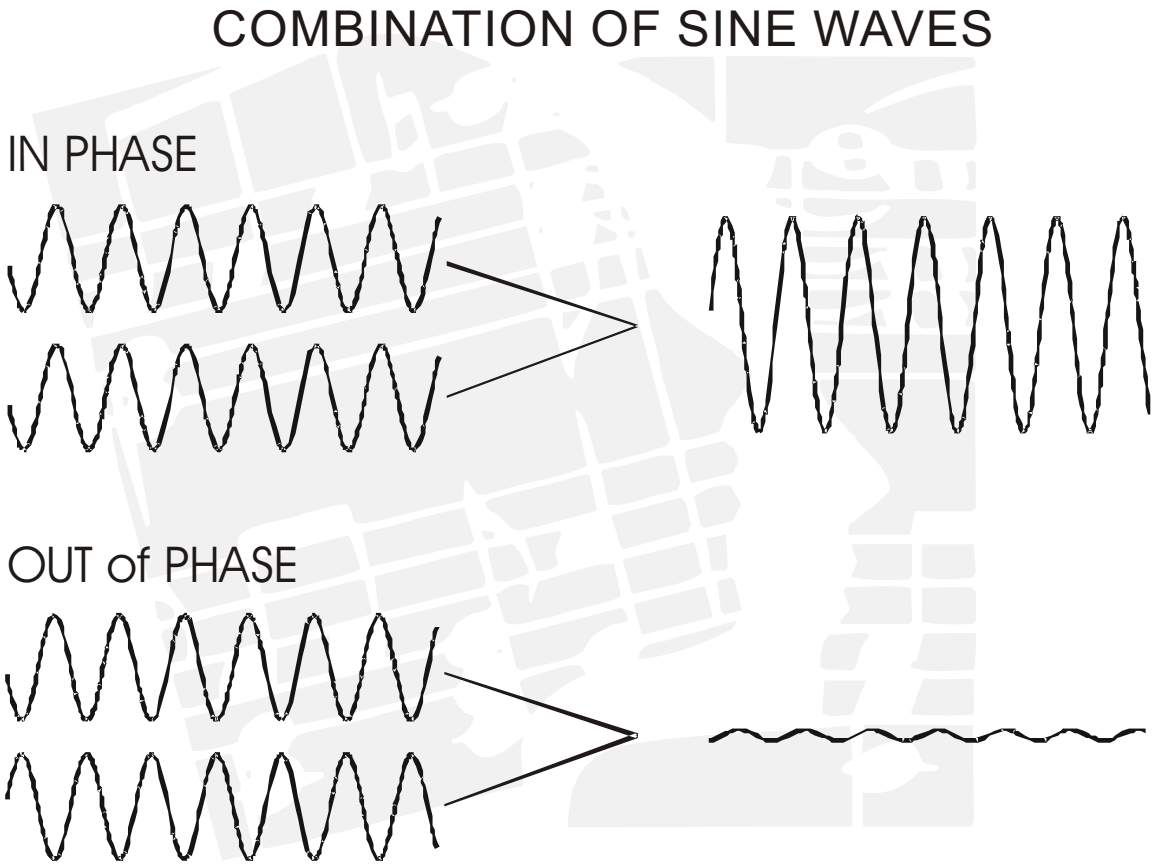


Figure 5

The simplest waveform is called a ***sine wave*** (Figure 6).

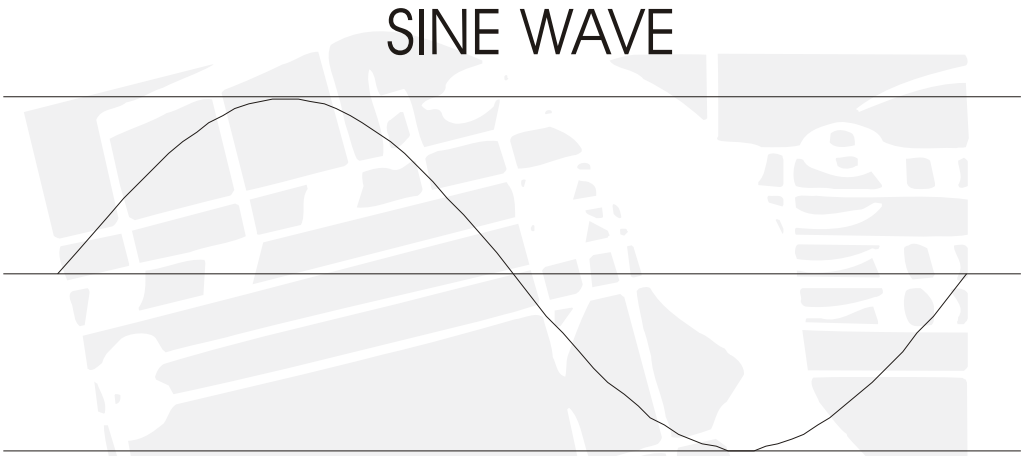


Figure 6

Waveforms associated with musical sounds are rarely pure sine waves. Musical sounds normally are the result of very regular vibrations or periodic vibrations. This is why a flute sounds like a flute and a violin sounds like a violin and they do not change in one moment so that they sound like each other. The vibrations that are a result of these instruments are regular and predictable. The sine wave is the simplest example of this and is also known as a ***pure tone***. The curves represented by the 2 instruments shown above in the section on timbre, show the flute to be the simpler waveform of the 2, with the violin being more complex because of its overtones. All of these waveforms can be broken down into a number of sine waves. The number of sine waves will be equal to the number of ***overtones*** and the fundamental. Our auditory system usually associates the frequency of the fundamental of the complex waveform with the overall pitch of the note.

Note: The representations in Figures 2, 5 and 6 are of ***oscilloscope*** traces.

RESONANT FREQUENCY

Resonance is the action of one object or system responding to a ***periodic force***. If we want to study the resonant quality of a violin, we must look at it as a complete system instead of its parts. The resonant frequency of a system is the one at which the smallest input of vibration/periodic force will produce the largest response. For instance, a string whose length in tension is tuned to 100 Hz will vibrate wildly in the presence of that frequency and will vibrate much less in other frequencies no matter if they are higher or lower. For example, the response to either 60 Hz or 140 Hz will be much less than to the 100 Hz. (Figure 7)

Figure 7

This frequency is known as the resonant frequency or natural frequency of the system. Its tendency to vibrate in the presence of this frequency in music is known as ***sympathetic resonance***. The examples in our daily lives are many. If soldiers march across a bridge in step with each other there is the danger that they will match the resonant frequency of the bridge in which case bridges have been known to begin to vibrate wildly. A wineglass can be shattered by sound if the sound wave matches its natural resonant frequency.

In the next section you will learn that the body is also made up of systems that have natural resonant frequencies.

Summary: Sound is a phenomenon in physics that can be measured and described as quantities. Even the quality of a sound, the timbre, itself is describable as the percentage or loudness of its harmonics.

We experience sound in a subjective way and more than 50 of our hearing is our memory (See Section 4 on Psychoacoustics.) The subjectivity of how we hear and process sound is as important to the healing process as are the absolute numbers that describe sound.

Glossary:

Physics- the branch of science concerned with the nature and properties of matter and energy. The subject matter of physics includes mechanics, heat, light and other radiation, sound, electricity, magnetism and the structure of atoms.

Vibration- when an object moves alternately in 2 opposing directions

Frequency- The number of oscillations that take place in one second. Oscillations include mechanical movements, such as pendulum swings, and electromagnetic and sound energies that travel in waves. Frequency is a measure of the number of waves that travel past a single point in one second. It is given in units of cycles per second, called hertz (Hz). (Figure 8)

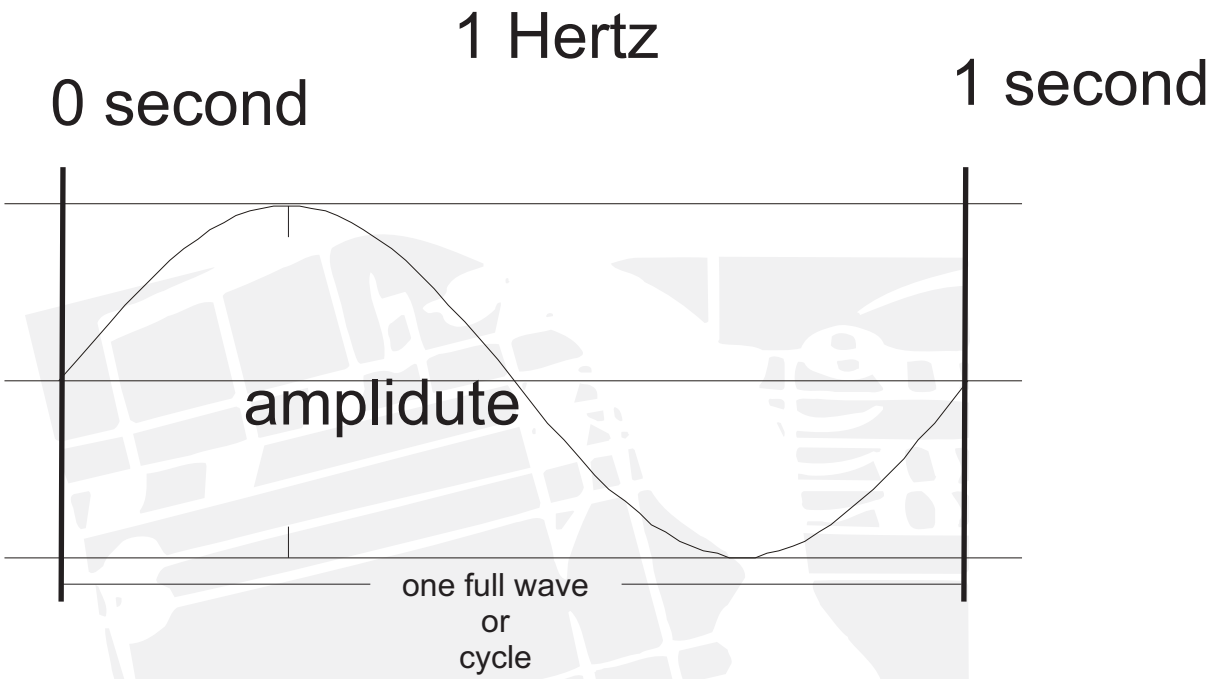


Figure 8

Pitch- The relative position of a tone in a scale, as determined by its frequency.

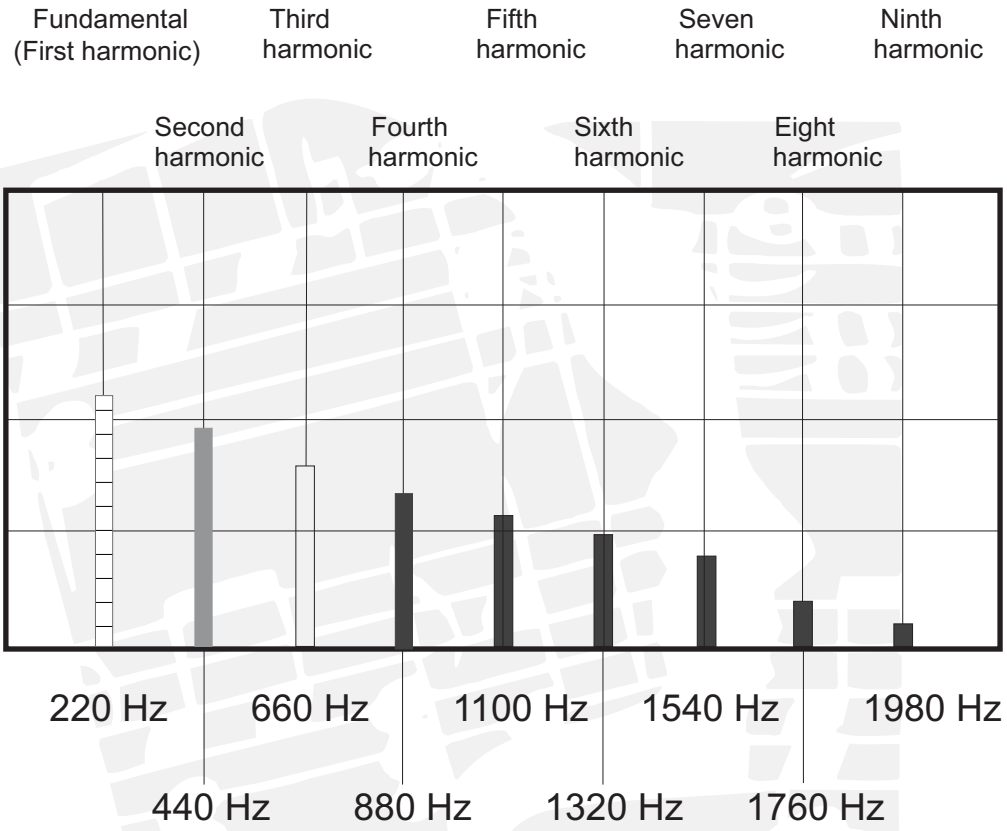
Timbre- The quality of a sound that distinguishes it from other sounds of the same pitch and volume; especially, the distinctive tone of a musical instrument, a voice, or a voiced speech sound.

Partial- synonym for overtone

Fundamental- first harmonic

Linear harmonic Spectrum (Figure 9)

LINEAR HARMONIC SERIES



Harmonics are the acoustic components of a musical tone. A note of A below middle C (see chart above), for example, has a frequency of 220 Hz--that is, the vibrations of the instrument and of the air exactly repeat themselves 220 times each second. This frequency is called the fundamental, or first harmonic frequency. When played by an instrument, this note is actually a complicated oscillation that also contains the second harmonic components (440 Hz) , third harmonics (660 Hz) , and so on. The second and higher harmonics are also called the upper partials, or the overtones of the fundamental.

Figure 9

Nonlinear harmonic spectrum- the ratios of the overtones to the fundamental are not expressed as whole numbers.

Tone 1. A sound of distinct pitch, quality, and duration; the characteristic quality or timbre of a particular instrument or voice. 2. A whole step

Wave- A disturbance or oscillation moving from point to point in a medium or in space.

Compression- when the number of molecules for a given volume is increased above the ambient density- the number of molecules for a given space when no other force is applied.

Rarefaction- when the number of molecules for a given volume is decreased below the ambient density -the number of molecules for a given space when no other force is applied.

Phase- the relative position of 2 sound waves with respect to one another usually measured in degrees. One complete cycle of a sine wave is considered to be 360 degrees, ½ cycle 180 degrees, etc.

Beats- When two tones of slightly different frequencies are sounded at the same time, a single sound is heard that gets louder and softer at regular intervals.

Sine wave- simplest wave form to represent sound. All complex waveforms can be distilled down to a series of sign waves, the number of which will be equal to the part of the sound that they produce.

Pure tone- a tone that is represented by a sine wave

Overtone- harmonics above the fundamental in the harmonic spectrum

Oscilloscope- an electronic instrument that produces an instantaneous visual display or trace of electron motion on the screen of a cathode-ray tube corresponding to some external back and forth movement or vibration.

Resonant frequency- the frequency at which a system responds much more violently than at any other frequency.

Periodic force- a force that exhibits a regular frequency of movement

Sympathetic resonance- the bringing into periodic movement (vibration) of one system that is responding to the periodic movement (vibration) of another system. This vibration can be transmitted through a gas or liquid.

2. Effect of sound on the biological functions of the body

In ***biophysics***, the study of how biology and physics interact with each other, new research, particularly by Dr. James Oschman author of Energy Medicine, is showing how sound acts on the biological processes in the body. The largest organ in the body, the ***connective tissue***, forms a continuous network that reaches all parts of the body and into the cells. The connective tissue surrounds all blood vessels large and small and all of the organs. All nutrition and waste that is exchanged between the blood vessels and the organs must pass through the extra-cellular spaces that are filled by the connective tissue. The maintenance of the condition of these spaces in order to favor this exchange is one of the important functions of the connective tissue.
Cell biologists have been able to identify these molecular interconnections between the connective tissue and the cells. The connective tissue is joined by its large fibers across the ***cytoskeletons*** of the cells. Cytoskeletons represent the bones and muscles of the cells and help them to maintain their shape and to move about. Within the cells this system connects with another matrix inside the ***nucleus*** and connects with the ***DNA***.

The connective tissue, cytoskeletons, and genetic material form an unbroken fabric or ***continuum***. This is all a living ***matrix*** that is in fact a matrix inside of a matrix. All organs, tissues and cells are made from this. At a molecular level it is the context and underlying layer where biological occurrences take place.

This living matrix forms a vibratory continuum. All of this molecular material conducts vibration. The entire network can create, conduct and radiate vibrations. Sound enters the body through this network and is carried through the body as electromagnetic waves called ***phonons***. Sound waves are also converted into heat, light and magnetic and electrical fields. Water is an active part of this matrix.

This living matrix has regions that have a crystal like structure or organization. These regions are like a crystal in a radio and have very specific resonant qualities and emit very specific frequencies. Because of this the fields of energy which are created and conducted emit a ***coherent*** waveform. This can be compared to laser beams. Coherent waveforms have a similar phase direction and amplitude. All of this favors the transmission and induction of sound waves and their frequency patterns to aid in the mobilization of the body's life processes.

It is felt (not yet proved) that these signals or waves will be very strong and have particular frequencies that will include visible light. It is possible to detect these types of signals from living systems.

This vibratory communication system flows through the living matrix into every region of the body and down into the nuclei of the cells. Various types of energy including sound are able to travel through this matrix.

From an evolutionary point of view this living matrix came before the nervous system. It actually regulates the global activity of the nervous system. The acupuncture meridians are the major channels of this network.

Because it is older on an evolutionary basis than the nervous system, the living matrix acts upon very basic healing processes such as regeneration, recognition of self and non-self (immune system function), and repairing damage to the body surfaces both internal and external, i.e. skin, organs, etc. These processes all regulate and maintain the body working against chronic and degenerative diseases.

Summary: The body is a living matrix that is highly responsive to sound and frequency patterns. Sound travels through the body via the connective tissue, the body's largest organ. The acupuncture meridians are the major pathways through the body.

Glossary:

Biophysics- the study of how biology and physics interact with each other
Connective tissue - any tissue in the body that maintains the form of the body and its organs and provides cohesive and internal support

Cytoskeletons- the structure of cells that help them to maintain their shape and to move about.

Nucleus- a complex, usually spherical, protoplasmic body within a living cell that contains the cell's hereditary material and that controls its metabolism, growth, and reproduction.

DNA- chromosomal constituent of living cell nuclei that determine individual hereditary characteristics.

Matrix- a surrounding substance within which something originates, develops, or is contained

Continuum- a continuous whole, no part of which can be distinguished from neighboring parts except by arbitrary division

Phonons- an individual unit of acoustic energy used especially in mathematical models to calculate thermal and vibrational properties of solids.

Coherent- pertaining to waves with a continuous relationship among phases

3. Effect of sound on the physiology of the body

The hearing mechanism itself is designed specifically to register sound over a very wide range of frequencies and amplitudes.

Human hearing extends from 20 to 20,000 hertz. As a person grows older the ability to hear high frequency sounds decreases. The range of loudness over which we can hear is measured in ***decibels***. A 3,000 hz tone of zero decibels marks the threshold of audibility—the weakest sound that the normal human ear can hear. 140 decibels will be painful to the ears and may cause serious damage. (Figure 10)

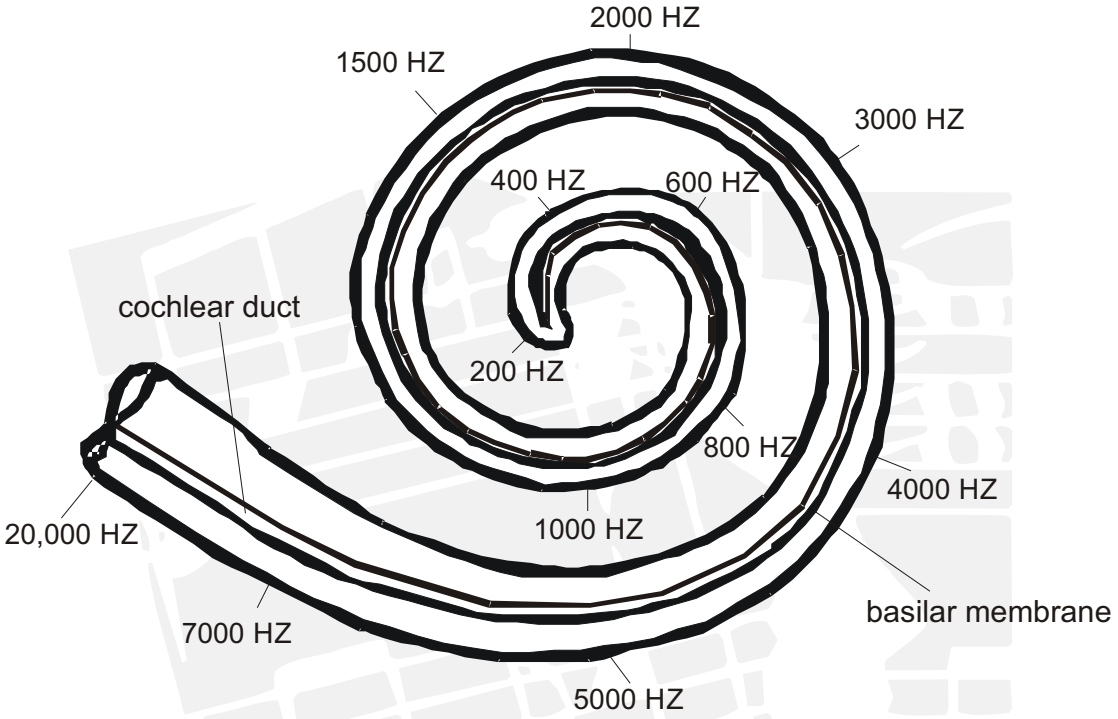


Figure 10

As will be discussed in the following section on psychoacoustics the hearing process begins when the sound comes in contact with our body, in particular, the upper torso, the head and the ***pinna***. After this initial contact the sound waves will enter into the auditory canal and come in contact with the eardrum causing it to vibrate. The vibrations from the eardrum move 3 bones of the inner ear- the malleus, which is attached to the eardrum, which moves the ***incus*** and then the ***stapes.*** The stapes moves the oval window that is the connection between the middle and the inner ear. The movement of the stapes and the oval window send the sound waves into the fluid that fills the cochlea of the inner ear. Different areas of the cochlea respond to different frequencies. The highest frequencies being close to the beginning, where it connects to the middle ear, and the lowest frequencies being close to the end or apex. (Figure 11)

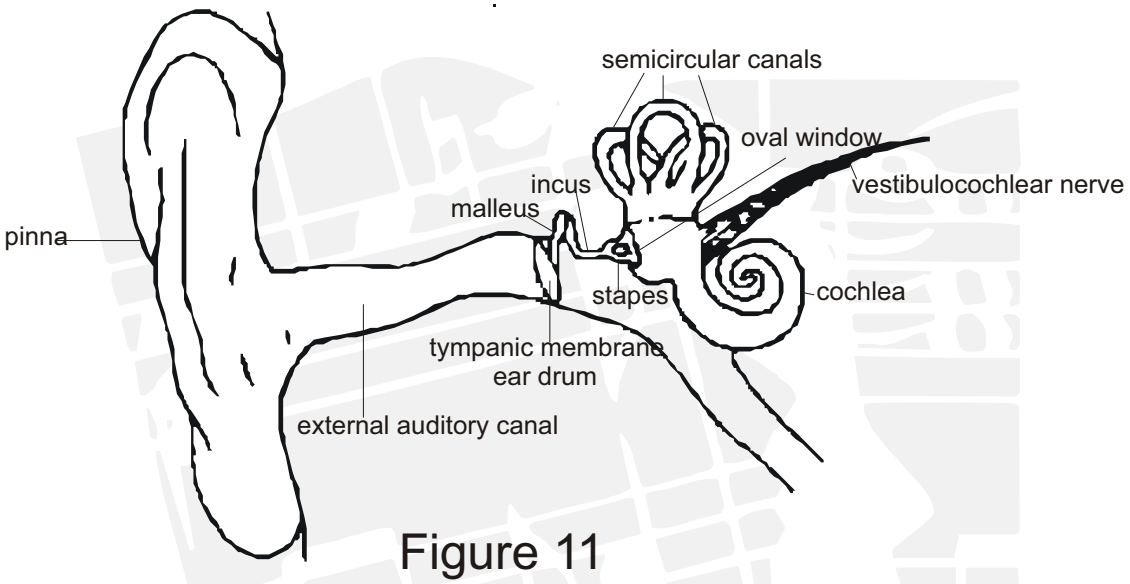


Figure 11

The bones that transmit the sound waves to the oval window also amplify these waves. This is necessary because sound does not pass as easily through the fluid of the inner ear as it does through the air. If it were not for this amplification, there would be a loss of about 30 decibels. Sound can also be transmitted directly through the bones of the skull to the inner ear. This is called ***bone conduction***. Our own voice travels to the inner ear through this type of bone conduction.

Once the sound waves pass into the fluid of the cochlea, movement is created against the ***basilar membrane***. The hair cells of the ***organ of Corti*** on the basilar membrane slide against the overhanging ***tectorial membrane***. The hairs bend and so create impulses in the cochlear nerve fibers attached to the hairs. The cochlear nerve transmits the impulses to the temporal lobe, the hearing center of the brain. The brain interprets the impulses as sounds.

Sounds of high, middle, and low frequency affect hair cells at different locations along the basilar membrane. High-frequency sounds move hair cells near the base of the spiraling cochlea. Middle-frequency sounds move hair cells near the middle of the spiral, and low-frequency sounds affect those near the top of the spiral. In addition, the nerve fibers of the basilar membrane send impulses of the same frequency as that of a particular sound.

The intensity of a sound determines how many hair cells are affected and how many impulses the cochlear nerve sends to the brain. For example, loud sounds move a large number of hair cells, and the cochlear nerve transmits many impulses.

Most people can hear sounds with frequencies from about 20 to 20,000 hertz. Bats, dogs, and many other kinds of animals can hear sounds with frequencies far above 20,000 hertz. Different sounds have different frequencies. For example, the sound of jingling keys ranges from 700 to 15,000 hertz. A person's voice can produce frequencies from 85 to 1,100 hertz. The tones of a piano have frequencies ranging from about 30 to a little over 4,000 hertz.

The frequency of a sound determines its pitch—the degree of highness or lowness of the sound as perceived by a listener. High-pitched sounds have higher frequencies than low-pitched sounds. Musical instruments can produce a wide range of pitches. For example, a trumpet has valves that can shorten or lengthen the vibrating column of air inside the instrument. A short column produces a high frequency, high-pitched sound. A long column results in a note of low frequency and low pitch.

The loudness of a sound refers to how strong the sound seems to us when it strikes our ears. At a given frequency, the more intense a sound is, the louder it seems. But equally intense sounds of different frequencies are not equally loud. The ear has low sensitivity to sounds near the upper and lower limits of the range of frequencies we can hear. Thus, a high frequency or low-frequency sound does not seem as loud as a sound of the same intensity in the middle of the frequency range.

The process of perceiving the sound will be dealt with in the next section on psychoacoustics.

Summary:
The body itself is made up of different types of material, some of which, as in the case of bones, vibrate easily, and others, in the case of finger joints, dampen the sound. While the joints that connect the ear bones are specifically designed to transmit sound, other joints in the body have been designed specifically to inhibit the transmission of sound. The resonant frequencies of the larger structures of the body are quite low in terms of mechanical vibration. However, as was mentioned in the section on biophysics, electromagnetic vibrations affect the body. In the last section in this area how different instruments vibrate different parts of the body will be addressed. What is clear is that the body does vibrate. Everything in nature has a resonant frequency and our body has the capacity to change mechanical vibration into electromagnetic vibration that then flows through the system as phonons.

***Glossary*:**

Decibel- a unit used to measure the intensity of a sound or the power level of an electrical signal

Pinna- the external part of the ear in humans and other mammals

Malleus- a small bone in the middle ear that transmits vibrations of the eardrum to the incus.

Incus- a small anvil-shaped bone in the middle ear, transmitting vibrations between the malleus and stapes

Stapes- small stirrup-shaped bone in the middle ear, transmitting vibrations from the incus to the inner ear. Also called 'stirrup'.

Basilar membrane- base lining of the organ of Corti in the ear,

Organ of Corti- a structure in the cochlea of the inner ear which produces nerve impulses in response to sound vibraions

Tectorial membrane- sheet-like lining covering the organ of Corti in the inner ear

Cochlea- the spiral cavity of the inner ear containing the organ of Corti

4. Effect of sound on the nervous system (Psychoacoustics)

There are many ***parameters*** that can change how we perceive sound. A free sound in the air will travel slowly diminishing in ***amplitude*** unless it comes into contact with some object, for instance, a wall, a body, etc. As the sound comes in contact with an object, as well as being reflected and/or absorbed, it will also try to resonate everything it encounters. Some objects are more reflective and some objects are more absorbent or ***dampening***. Objects will resonate more or less depending on whether their natural resonant frequency matches the sound.

Parts of the human body are very absorbent. However, in all acoustically absorbent materials certain frequencies are more readily absorbed than others are. This will mean that as the sound passes through and around the body, depending on our orientation to the source, what arrives to both eardrums is quite different. The ***pinna*** filters sounds as they are about to enter the external ear canal. Depending on the angel that the sound arrives to the pinna, different frequencies are filtered out. If the sound must pass through the body before arriving at the pinna, then the body will filter or absorb some of the frequencies of the original sound.

The sound now arrives to the external ear canal. As it passes through it is affected by the resonant qualities of this channel. The affect of this resonance is to boost or increase the volume between 2000 and 3000 Hz and to attenuate or decrease the volume at 10,000 Hz. After this filtering and amplifying of the sound source, the sound event that takes place at the eardrum is clearly different from that which left the source. This information is processed by the brain at an unconscious level; therefore, our nervous system probably looks for this kind of information in every sound event.

Evolution has favored those who were able to process this information. The lack of this information in a sound event such as in a typical ***stereo*** recording or in a ***monaural*** recording will create a certain level of stress in the unconscious nervous system as it looks for information that does not exist.

The exact way, in which each individual's body absorbs (filters) and reflects sounds, as well as its resonant quality, is unique. Each of us fine-tunes our ability to recognize our own unique pattern of the precise localization of sound. Most of this contributes to our ability to localize sounds in our environment, an ability that evolved over thousands of years to aid in our survival. We memorize this pattern at an unconscious level and it becomes a part of our hearing process. This, as well as other types of memorized information, makes up 50 percent of our hearing process. For example, we unconsciously memorize certain musical progressions so that we will often know what the next note will be or should be. This is called 'musical expectations'. We are also able to learn how to recognize very precise and specific tones or frequencies because of the use of our memory. Our hearing apparatus is not precise enough to do that job, so we must use our memory to do it. All sounds that come in are compared against our memory at an unconscious level of brain processing.

Any type of filtering will be analized by the ***nervous system*** in an attempt to get information. By presenting a very specifically filtered sound to the nervous system we can stimulate it and bring its attention to a specific point in space. Through this process of localizing the sound event in a particular area or point in space, our attention is brought to that area. By bringing our attention to a particular area, we can activate it. Some of the areas that can be activated through these phenomena are the two ***hemispheres***, the ***cerebral cortex***, or the ***occipital region***, or ***reticular formation***, for example. By focussing the attention on specific places inside the head we stimulate our awareness.

In particular the reticular formation has major influences in arousal, attention, and wakefulness. Sound influences us in many ways, both at a conscious and unconscious level. By knowing how this takes place we are able to create specific sound stimuli which will aid in the healing process and awareness.

Another way that we recognize sound is by its volume. The main information that comes from volume is distance, so if we hear a train whistle and it is at a very low volume we will make the assumption that the train is far away. In the stereo recording of an orchestra the main difference between the 2 channels is the relative volumes of different instruments. Stereo recordings are often lacking in spatial information that comes from the filtering of sounds as mentioned above. Our unconscious is looking for this information.

How can the body's own mechanism be used to affect change with sound? As mentioned above, by locating the sound somewhere inside the head, it is possible to activate different parts of the brain. This location may be static or may be dynamic. One technique that is used to do this is ***binaural beats***.

Using binaural beats creates a circling sensation of the sound inside the head. This will relax the listener and, more importantly, cause the 2 hemispheres to come more into balance. It is necessary to use headphones to get the effect of binaural beats. Presenting a tone of a slightly different frequency to each ear creates the effect. The difference in frequency normally needs to be 10 Hz or less. For examples, 200 Hz to the left ear and 205 to the right ear will produce a circling effect based on the 5 Hz difference. It also creates an ***entrainment*** effect of 5 Hz. Normally, with recorded material we would not be able to deliver the 5Hz signal because of the limitations of the recording process. So this technique of using 2 audible tones which have a small difference allows us to arrive to very low frequencies. This phenomena of subtracting one frequency from the other takes place whenever there are 2 tones present, and the resulting tone is called the ***difference frequency***.

If we begin to change the frequency of one of 2 equal tones, as the distance between the 2 tones grows, we will first experience the sensation of roughness. Then there will be the experience of beats, and finally the 2 tones will emerge as separate pitches. The point at which the 2 become separate sounds or pitches is known as ***the limit of discrimination***. Below this limit of discrimination where the 2 sounds are very close together, but a small difference exists so that the experience is of roughness, there will be a certain irritation or activation of the nervous system that will not be appropriate in all healing situations. The rough harmonic quality of intervals and chords that contain partials that do not match exactly and have a small enough difference to create roughness is a characteristic of the general lack of harmonic integrity found in equal temperment. There are no instruments that exhibit a harmonic spectrum consisting of partials related by the intervals of equal temperment. For this reason equal temperment will not be appropriate for all therapeutic music. For example, Sound Touch is recorded in Pythagorean tuning. Some of the other CDs are recorded in equal tuning to allow them the textural complexity that is necessary to treat certain themes i.e. New Heart and The Brain Tape, for example.

The exact 'point of roughness' varies from person to person, but it is generally experienced when 2 tones become separated by about 10 to 15 hz. The limit of discrimination is reached when the differences between the frequencies are increased. It is at this point that the active regions on the ***basilar membrane*** corresponding to the 2 frequencies become sufficiently separated to allow the perception of distinct tones. The characteristic roughness persists even after the tones become separated by the limit of discrimination. As the difference between the frequencies increases beyond this limit, the sensation of roughness becomes one of smoothness. The point of this transition is called ***critical band***.

By creating novelty we can stimulate and activate our mental processes. This can be done in several ways. By creating music without a recognizable rhythm or beat will keep the listener from falling into their musical expectations. The use of textural complexity with the interweaving of different sounds and instruments creates a high level of contact with self. Also by creating special sounds, and by mixing instrumental and natural sounds it is possible to create the same effect. Various filtering of the sounds will create more 3 dimensional information and movement within the sound object. All of these activate the brain. Obviously, when creating these psychoacoustics effects, the music needs to be recorded.

All of the CDs in this course were recorded with psychoacoustic effects especially developed to enhance the effect of the music. The specific recording technique used here is Spectrum Sound Resonance System (SSRS).

Sound input is extremely important for both our conscious and unconscious mental processes. Not only the use of sound as a therapeutic tool, but an awareness of our sound environment becomes an important part of any sound and music therapy. In the section on equipment and recording more information about the quality of the recording will be given. Here, however, it is important to mention that normally unwanted elements such as tape hiss, magnetic distortion from improperly magnetized tape heads, cheap speakers or headphones that are distorted are particularly counter-indicated in sound therapy.

Summary: By accurately delivering to a client specific auditory information it is possible to aid them in their process of healing and change. They can be helped to create more consciousness and awareness of self. Also, many negative emotional patterns can be disrupted by the use of sound. There can be a general clearing of the emotional system to aid in the free expression of the emotions. Learning can be stimulated and memory increased. The body can be energized for creativity and as well be calmed to enter into deep, restful sleep.

Glossary:

Psychoacoustics- the study of how sound and music effects the human nervous system.

Parameters- a fixed limit or boundary

Amplitude- the maximum value of a periodically varying quantity.

Dampening- to deaden

Pinna- the external part of the ear in humans and other mammals

Stereo- sound that is directed through two or more speakers so that it seems to surround the listener and to come from more than one source

Monaural- of or involving only 1 ear, another term for monophonic- using only one channel of transmission in comparison with 2 channels as in stereophonic

Nervous System- a coordinating mechanism in all multi-cellular animals that regulates internal body functions and responses to external stimuli. In vertebrates it consists of the brain, spinal cord, nerves, ganglia, and parts of receptor and effector organs (organs that send or receive specific stimuli.)

Hemispheres- right and left sides of the brain

Cerebral cortex- the extensive outer layer of gray tissue of the cerebral hemispheres, largely responsible for higher nervous functions.

Occipital region- point at which the neck connects with the back of the head

Reticular formation- an extensive network of nerve pathways in the brainstem connecting the spinal cord, cerebrum, and cerebellum and controlling the overall level of consciousness

Binaural beats- when 2 tones of slightly different frequencies are presented to a different ear through headphones without interacting acoustically or electronically. The perceived beats will give the sensation of the sound circling inside the head.

Limit of Discrimination- the smallest perceivable difference in frequency between 2 tones played simultaneously

Entrainment- training

Difference frequency- the perceived frequency of the difference between 2 frequencies of sounding tones

Basilar membrane- part of the inner ear

Critical Band- the point at which the sensation of roughness accompanying 2 tones starting in unison and moving apart in pitch becomes a sensation of smoothness

5. Theory and function of emotions

The emotions are genetically encoded into the ***central nervous system*** of all humans. Actually this encoding goes far beyond ***homo sapien*** and the basic emotions can be identified throughout the ***vertebrates***. There are many systems of classification of emotions, some naming 2, or 8 emotions such as love, hate, grief, joy, reverence, anger sex and fear. The encoding of these emotions means that they universally exhibit specific physiological and psychological changes when they are activated. This means that what will make an Eskimo angry and what will make an Italian angry will probably be quite different, but once the anger is activated the physiological and psychological responses will be the same.

Each emotion has its own characteristic brain pattern, hormonal and cardiovascular changes. As well each emotion has its own cycling time which means that once it has been activated, if it is not inhibited, it will take a certain amount of time to grow to its peak level. Then it will have a sustain level and then it will return to normal. If the activation continues, then obviously there will be a long maintenance. If it is blocked, then certain changes that occur with the emotion will remain active; it will not complete itself.

Emotions are necessary to our survival, our happiness and our growth. That includes all emotions. There is no good or bad emotion in this sense. What is good and bad about emotions is when they are blocked, when they are activated out of context, or when they do not complete themselves. Uncompleted emotions become registered in the body. These registries or memories become blockages in our psychological and physical body.

As a sound wave enters into the body and begins to touch the different systems, these systems begin to react by trying to vibrate at their natural frequence, however, they come up against the blockages mentioned above. These blockages are referred to in psychology as 'defenses' and hold emotional charge from trauma, interuterine or early childhood experiences. We mount them in order not to feel pain from these experiences.

One of the things that we feel as we begin to move against these blockages is the pain, memory, or discomfort that the defensive blockage covers or defends. This is such a strong process that it can even change what we hear. Once a woman who used Inner Sound had a friend. Every time the friend came and heard the music she said, “I can't listen to it because it's electronic, you know, I just can't. It makes me too uncomfortable.” Her friend kept encouraging her to try to listen more to release the blocked energy, but her reaction was always the same. Several years later she came to a live demonstration given by Arden. She liked the demonstration very much and afterward she asked for Personal Music to help her with this blockage. Arden made the tape and the woman was very pleased with it. She said it was so different from the rest of the music she had been listening to up to then. Her friend then put on some of the same tapes she had heard before but had had so much trouble listening to. “But that's not the same music I heard before!” she exclaimed when the first tape came on. Her friend kept putting on a different tape and her reaction was the same, “It just can't be the same music.” It was. The blockage that had made her so uncomfortable had been softened in the Personal Music changing her experience of the sounds.

One important aspect of the emotional defenses is how they hold us where we are so we will not feel pain from the past. These defenses are blockages that create limitations for us as adults at the same

time that they are trying to protect us from the pain of the child. These types of defenses were created when we were a child, and they always have the component of the child. Defenses in themselves are not negative, however. They have a purpose, but our inability to use them in appropriate situations and put them aside in other situations where they are not appropriate keeps us from expanding ourselves, from reaching our potential, from opening ourselves to ourselves and others, to grow and evolve as adults.

There is a good argument to listening to music that we do not like. Normally, we do not like a specific piece or style of music because it touches our blockages. This does not mean that it is better only to listen to music you do not like, but it is important to bear in mind that music can both move blockages and on the other hand reinforce them. The most common example of the latter is rock music, with its hard driving beat, which touches the natural frequency of the adrenal glands. For young people who want to feel alive, this kind of music can be addictive. For older people who want to feel security, rock music might be threatening.

Music can create greater contact with ourselves by helping us to feel more, to be more aware of our sentiments and feelings. One of the things that makes sound and music therapy so powerful yet at the same time benign is that it can activate the emotions themselves, emotional blockages and memories, creating an internal activation. However, there is no real threat from the outside. Therefore, the activation created by the music or sound can bring about a new perspective about how we create our lives. The emotions that come up will relate to feelings that one might normally have in different every day situations, but the difference in the every day situation is that there is normally some perceived justification from the outside for what is felt. This can be in the form of another person, institution or supernatural force. Even nature can be blamed! When we feel these same things only by listening to music, then it begins to become clear that there is some energy trapped inside of us that is creating what we feel.

Glossary:

Central nervous system- in humans consists of the brain and spinal cord

Homo sapiens- classification and species to which all modern human beings belong

Vertebrates- any animal having a backbone and characterized by a muscular system and a central nervous system partly enclosed with the backbone

6. Effect of Sound on the Emotions

The body vibrates at all levels from the sub-atomic all the way up to the level of organism. Each part and system of the body has its own unique frequency pattern, for example, the ***receptors*** and ***ligands***, which bring about chemical changes in the body such as endorphin reactions, vibrate into place. Ligands are ***neurotransmitters***, ***steroids***, which include sex hormones, and ***peptides***, which regulate practically all of the life processes. Receptors are sensing molecules on the surface of cells waiting to receive the information from the ligands. "... 2 voices— ligand and receptor— striking the same note and producing a vibration that rings a doorbell to open the doorway to the cell", says biophysicist Candace Pert in her book, Molecules of Emotion.

In the past the model used for neurotransmitters and their receptors was a static one of the keyhole and the key. We now know that they are both vibrating in a kind of harmony so that the neurotransmitter can couple with the receptor to bring about the changes that include all emotional reactions. At a chemical level the emotions flow through the body based on this system of body/chemical communication. Electrical impulses are then sent back through the nervous system to the brain in a loop effect.

The musical thrills that we have all experienced come from the rush of endorphins (ligands) entering into the receptors. In fact, all emotional responses are keyed throughout the body simultaneously by these ligand/receptor interactions, which form another communication system equal to that of the central nervous system with its nerve fiber pathways. Sound and music easily activate both of these 2 systems. The freeing up and activating of the emotional system can be one of the first steps to unblocking much deeper traumas which are stored in the body's musculature and connective tissue on down into the cells themselves. These traumas not only affect our expression, but other systems in the body, creating other imbalances and malfunctions on a mental and physical level from depression to cancer. The different movements within the body's symphony relate to the different areas and systems of the body. Different INNER SOUND motifs on the Sound Touch CD as well as the music made up of those motifs on the other CDs work with different movements of the body symphony.

To use an analogy here: Imagine the length of the body as a string. It wants to vibrate over its entire length; however, the particular body that we are talking about can not vibrate as one for it is cut at the diaphragm, having chronic tension in this muscle which is the largest in the body. The tension is created in this area in order not to feel various emotions, both pleasurable and unpleasant. To continue the analogy, when the string is divided, the frequency goes up, and the more times it is divided, the higher the frequency becomes. This does not mean more energy. As the frequency goes up in this case, the amplitude goes down, and this body has less capacity and force, and there is more nervousness and 'high-strungness' along with the reduced capacity to feel.

Biophysics, the study of matter and energy as it relates to the body, gives some explanation of why sound works so well to help unblock chronic tension in the high-strung body mentioned above. Studies show that sound waves are conducted through the body as electromagnetic waves and are converted into other forms of energy such as heat, light, and electrical fields. These different forms of energy effect different systems and structures in the body by regulating, balancing and unblocking them. The pathway of travel for the sound waves is through the connective tissue that forms a continuous network into all parts and systems of the body down to a cellular level. The primary routes through the body can be mapped as the acupuncture meridians.

Glossary:

Ligand- neurotransmitters, steroids, which include sex hormones, and peptides, which regulate practically all of the life processes.

Receptor- sensing molecules on the surface of cells waiting to receive the information from the ligands

Neurotransmitters- a chemical substance which is released at the end of a nerve fiber by the arrival of a nerve impulse that effect the transfer of the impulse to another nerve fiber, a muscle fiber, or some other structure

Steroids- a category of ligands that includes the sex hormones

Peptides- any organic substances of which the molecules are structurally like those of proteins, but smaller.

7. Field Theory

In 'Effect of sound on the biological functions of the body' parts of the body that can be dissected, measured and put under a microscope were discussed. There is also a great deal of research, much of it Russian, which takes us to the next level, or what is called the 'field theory' of the body. Through this science we are able to measure the radiation and discharge from the body and interpret the energy fields which are taking place in the body as well.

It is important to understand that the electrical bonds at a cellular and sub-cellular level in the body must maintain a very delicate balance. This balance in living things must never be too strong or too weak. If it were too strong, we would no longer have the ability to change, regenerate, and grow. If they were too weak, we would simply fall apart. Each cell has its own characteristic frequency. Through resonance a ***coherent field pattern*** can cause subtle modifications to these bonds. The coherent field patterns help to organize the bonds in situations where they may otherwise degenerate into chaos, i.e. the death of the cell. These bonds can not be regulated in a static way, therefore, the whole concept of balance is a dynamic one, a kind of elastic dance of expansion and contraction. Music and sound are coherent fields that can create a positive influence on this dynamic balance.

This dynamic balance all takes place in real time. 'Real time' refers to the fact that time is as important to the matrix and each cell as the physical components of the cell. If we use the example of a pendulum, we can describe the pendulum's physical nature, but if we speak about a live pendulum, we are always talking about where it was a moment ago as it moves through its ever-changing arc. By the time we have made reference to its position, it is already some place else.

It is the combination of change and time that moves us away from static concepts about the body. In real time we have no such thing as a liver. We have a matrix or an organization that is in a constant state of flux as new cells are coming into being and old cells are being released. This state of flux or transformation is very different from the concept of the body being a collection of parts. This is also the reason why the effects of the same sound or tone on the body are not the same in different moments in time. This state of flux is a natural thing and is continuous in a healthy body. Our body is continually trying to move from the present that becomes the past into the future. In the 2 areas in this section on emotions we found that the same is true about emotions, that they have a time element, and that normally when we have blocked emotions it is because they are out of that element- they are no longer in present time.

In the first area of this section it has already been said that sound waves are converted into heat, light, and magnetic and electrical fields. These various forms of energy are all present in the body, and in the field theory are continuous and do not stop at the limits of the ***epidermis***. The field theory of the body

includes all of these various types of subtle energy. The electromagnetic radiations of the body can be used to diagnose conditions in the physical body. One diagnostic application of this is ***Kirlian photography***.

ELECTROMAGNETIC FIELD- EMF

Any movement of electrical current, i.e. movements of ***ions***, regardless of its source, will create an electromagnetic field (EMF). Just as this field can be measured at some distance around a wire that supplies the current for a light bulb, heater, etc., so can the complex currents flowing throughout the human body also be measured and seen. Our electrical impulses are created chemically and run as a constant feedback system throughout our bodies using the central nervous system both as a transmitting organ and a receiving/responding organ. These emanations of electromagnetic energy form part of what is generally known as the 'aura'.

In the EMF there are major crossing points known as energy centers or ***chakras*** where specific types of information or vibrations are either used or generated. These energy centers are part of a system of energy channels, most of which run inside the body, to allow the circulation of energy throughout the body. These channels include the acupuncture meridians described in traditional Chinese medicine. The radiant energy can be seen or measured outside the body. Kirlian photography is able to capture part of this emanation. Also, some people who are able to see farther into the ***infrared and ultraviolet light spectrum*** are able to see part of the aura.

As part of gaining a working knowledge of the INNER SOUND CDs for both yourself and others, it will be helpful to know how they correlate to the electromagnetic field and visual spectrum parts of the EMF. This will aid in incorporating INNER SOUND into other systems and other information you may already have. Normally, the energy centers and layers of the EMF are defined separately. In INNER SOUND they are combined into 7 basic energy matrices, each including 1 of the 7 major energy centers and its corresponding level of radiance around the body. They are as follows:

FIRST ENERGY MATRIX: Includes first energy center located at the base of the spine, the energy centers located in the bottoms of the feet in the arches, the channels running through the legs and the radiant energy circulating along the skin out to a distance of approximately 3 inches around the whole body. This matrix has to do with physical space and being well earthed or grounded in the physical reality.

SECOND ENERGY MATRIX: Second energy center, between the ovaries or behind the prostate, and the radiant energy between 3-6 inches from the body. This matrix has to do with the expression of emotions.

THIRD ENERGY MATRIC: Third energy center, solar plexus, and the radiant energy between 6 and 9 inches from the body. This matrix has to do with the circulation of energy throughout the entire system, and personal force.

FOURTH ENERGY MATRIX: Fourth energy center, center of chest, and the radiant energy between 9 and 12 inches from the body. This matrix has to do with integration
and unity.

FIFTH ENERGY MATRIX: Includes the fifth energy center located at the base of the throat, the channels in the shoulders and arms, hand chakras and the radiant energy from 12 to 18 inches from the body. This matrix has to do with expression and creativity.

SIXTH ENERGY MATRIX: Sixth energy center, brow, and radiant energy 18 to 28 inches from the body. This matrix has to do with reason and clarity.

SEVENTH ENERGY MATRIX: Seventh center, crown, and the radiant energy 28 to 36 inches from the body. This matrix has to do with concepts about self, relation to cosmos, belief system.

Glossary:

Coherent field pattern- organized pattern of energy

Epidermis- the skin

Kirlian photgraphy- a technique for recording photographic images of the corona-gaseous- discharges and hence the aura of living creatures.

Ions- any atom or group of atoms that bears one or more positive or negative electrical charges

Chakras- Sanskrit word for wheel or circle

Infrared- electromagnetic radiation having a wavelength just greater than that of the red end of the visible light spectrum

Ultraviolet- electromagnetic radiation having a wavelength shorter than that of the violet end of the visible light spectrum.

8. Acoustic and electronically produced sounds

We can divide instruments used to make music into 2 separate groups, acoustic and electronic. These two groups can be separated into several types of instruments. Acoustic instruments can create sound by a string vibrating, as in the case of the guitar, violin, cello, or piano or by the air in a resonating tube, as in a flute, tuba, and trumpet. In the case of drums it is a vibrating diaphragm, or with a triangle, gong or Tibetan singing bowl it is a vibrating metal shape. This sound wave then goes out into the air.

Normally, acoustic instruments create complex wave patterns. (See 'Physics of sound' in this section.) One instrument that creates the simplest sound wave is a flute. By 'simple' is meant that it is nearly a sine wave or pure sound. The materials of all of these instruments, brass, wood, catgut, steel, drum membrane or metal transmit their resonant quality into the air and the sound travels to the listener.

Electronic instruments can be divided into 2 basic groups, ***synthesizers*** and ***samplers***. A synthesizer is typically a keyboard with electronic ***tone generators*** or oscillators which can add sine waves together to make complex sounds. This electronic information must then be passed to speakers or headphones in order to travel freely through the air. A sampler is a ***digital recorder*** that is capable of playing back sounds that have been recorded and stored in it. For example, we can record and store the sounds of all the keys on the piano, both when struck hard and soft. Then, when the key is struck on the electronic keyboard, the sampler takes the information of which key and how hard it is struck, and plays back that sound which had been recorded on the piano. An interesting ability of the sampler is that any sound can be recorded into it and played back with musical pitches. This gives a high level of control over the production of sound. For example, the water and wind as well as the birds on the Magical Garden CD were sampled and played on a keyboard. The different pitches of water, wind and bird songs represent the motifs that are on this CD.

When sounds are recorded, whether they are electronic or acoustic, they are converted into electronic impulses and from that time on they are in an electronic medium. In order to reproduce a recorded sound, either headphones or speakers are needed. In the INNER SOUND CDs, sampled, acoustic and specially created synthesized sounds have been used.

Glossary:

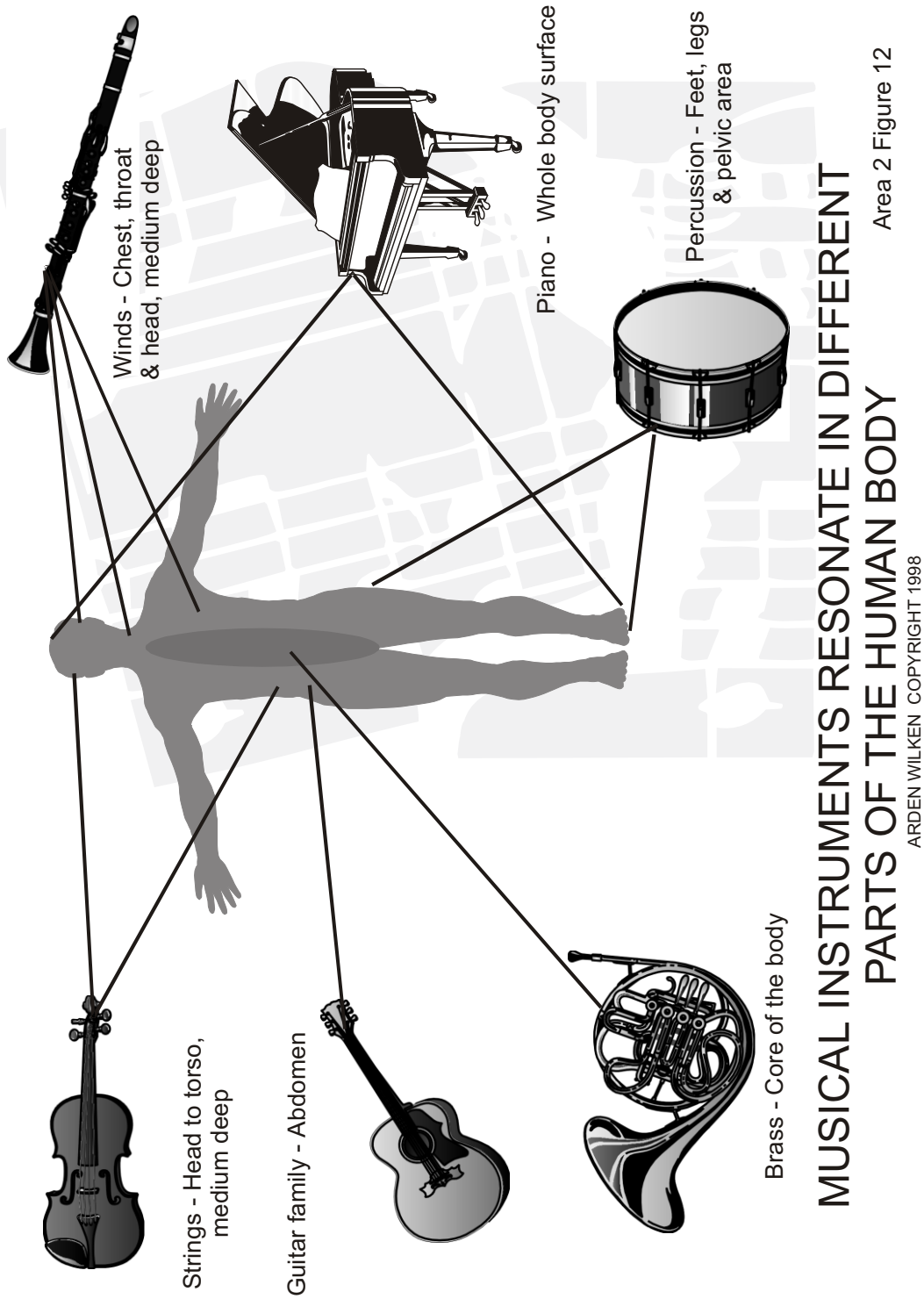
Synthesizers- an audio signal processor that has built-in sound generators (oscillators) and additional circuitry such as filters. Synthesizers can produce familiar sounds and serve as conventional musical instruments, or they can create many unique sounds and effects on their own.

Samplers- a digital recorder that is capable of playing back sounds that have been recorded and stored in it.

Tone generators- oscillators

Digital recorder- recorder that converts analogue signal into a digital code and stores it on either tape or some other magnetic medium

9. WHERE INSTRUMENTS RESONATE



When an instrument is played, whether strummed, struck or blown, it creates a vibration, a movement of particles in the air surrounding it. Such movement emanating outwards from a vibrating source - whether a violin string, trumpet or drum - creates a sound wave.

Each musical instrument has certain characteristics that determine where in the human body its vibration will create the most resonance. Such characteristics include the timbre and range of the instrument's sound. Timbre was discussed earlier in this area in 'Physics of sound'. The number of octaves it can play determines the range of an instrument. For example, the range of the piano is 7 and a third octaves, and most other instruments, with the exception of a cathedral organ, fall within this range. Using the same reference as before, an instrumental range of 7 and one/third octaves can be measured as a frequency range of 32 to 4,186Hz (cycles per second). The octave range of the human voice normally falls between 80 and 1,000 Hz.

The timbre and range is what causes each instrument to resonate in specific parts of the body. In sound and musical therapy/healing specific instruments are used depending on which kind of activation is sought. Some sounds penetrate deeply into the physical body; others touch the emotions, the mental or more spiritual aspects.

The piano has the largest range of the more common instruments. Hammers striking the strings produce the piano sound. This aspect, as well as its structure, materials and other details of the instrument create a specific harmonic structure. (The piano actually produces both kinds of harmonics, linear and non-linear because it has strings and they are hammered.) This harmonic structure activates the body, the emotions and the mind equally.

The harp is played by plucking its stings. It has nearly the same range as the piano, however, it creates more activation in the emotional system than the paino, but less in the body and the mind. As well, the harp activates the outer layers of the EMF. Other keyboard instruments such as the ***harpsichord*** stimulates more the mental aspect.

_____

Exercise 1: The next time that you hear the glissando of a harp or a melody played on a piano, take a moment to feel the impact of the notes as they move through your body. Note: If you will remember from Section 1, pianos are normally tuned in equal temperment. For this reason keyboards have the most difficulty to produce pure harmonics because of the limitation of how they are tuned.

Exercise 2: Listen for approximately 10 minutes from the beginning of the SOUND TOUCH CD. It is a piano, but tuned in Pythagorean tuning. The sound may sound a bit strange to your ear because of this tuning, but your body should relax more easily because the overtones are lined up and therefore do not produce any roughness or beats.

The next group of instruments, the strings, touches the emotions more deeply than the piano or other keyboard instruments. Partly this is due to the purity of the harmonic structure that the string family can produce but also because their timbre activates the emotions, particularly those of the heart. The queen of the string family is the violin. Known for its lush, romantic melodies - the violin is probably the instrument (except for the human voice) that most easily produces musical thrills throughout the whole body. One of the most popular classical pieces today, the Canon in D by Pachelbel, is an example of the beauty created by the string family when playing together.

Exercise 3: Listen to VOYAGE TO FREEDOM, Track 1 approximately 16 minutes and 30 seconds into the track until the end. Notice how you feel while the violin is playing.

The woodwinds normally include the flute, clarinet, oboe, bassoon and saxophone. They also touch the emotions, but in their unique way. The woodwinds enhance the expression of emotions. The combined effect when different instruments play together may help understand this concept. In a trio that consists of a piano, violin and flute, the piano creates the basic sound fabric over which the violin and the flute weave their own special communication. The violin speaks more to the emotions of the heart, whereas the flute emphasizes the outward expression or flow of these emotions.

Exercise 4: Listen to VOYAGE TO FREEDOM, Track 2. In the first 5 minutes you will hear the harp, violin and flute. Simply put your attention on what this combination of instruments makes you feel. During the second 5 minutes different instruments play. Notice if you feel any difference with these. Finally, the last 5 minutes repeats the music and instruments of the first 5 minutes only slower. Again, pay attention to what the music evokes in you.

The brass instruments, including the trumpet, the trombone, the french horn, etc, create more activation in the center or nucleus of the body. Their timbre penetrates deep into the body. Each brass instrument has its own, specific area of activation; for example, the trumpets domain is the head while the french horn vibrates more in the stomach/solar plexus area.

Percussion instruments activate the nervous system in the body and certain glands, the adrenals and gonads. When we hear the pulse of rock music, reggae or other kinds of rhythmic and ethnic music we want to get up and dance and move our body. They make us feel more excited, more alive. The percussive quality and area of activation produces a strong effect. If they are not amplified, these sounds can have great therapeutic effect. However, where these sounds are highly amplified it is important to listen to them at lower volumes. This is particularly true of rock music, for two reasons: 1. Sustained exposure at high volume (rock concerts and discos) will permanently damage hearing, and 2. The adrenal or gonad glands become over-activated. This puts stress on the nervous system.
The delicate strum of a guitar, played by a lover in the moonlight, the sound of the same instrument accompanying the passionately tapping heels of a Flamenco dancer, where do they touch us? The guitar, the lute, the mandolin and the banjo have a simular effect to that produced by the strings, but focus on more visceral emotions. The violin helps put us in contact with feelings and emotions that take us beyond our everyday existence, opening our hearts to our humanity. The guitar and other instruments that are played in the same or similar way, help us contact, feel and express our feelings about life such as our loves, passions, joys and sadness.

Exercise 5: Listen to RADIANT BODY CD Tracks 1 and 3. The use of the guitar in this music is reminiscent of a heartbeat. What do you feel when you listen? Other instruments to be aware of while listening are the flute, clarinet, trumpet and strings.

Perhaps you felt the music in the above 5 exercises in a different way or in a different part of your body than described in this section. One reason this may happen is due to the existence of chronic physical tension, blocked emotions stored anywhere in the continuum of connective tissue. When the sound is played and activates the correspondng areas, you or your client may not feel the primary vibration because of such a blockage. The blockage defelcts the resonance to another area and you only feel the

area activated by the deflection. As discussed in an earlier area of this section, in some cases, a blockage or tensions may be so severe that you would dislike intensely a specific instrument or group if instruments. It is not uncommon that the dislike for an instrument can change at a later stage in life. As you evolve and blockages are moved and areas of the body become freed up from past, stored emotions, the disliked instrument will no longer be objectionalbe. Such changes are possible if you are willing to listen to music with an open mind and allow the music to enter your body, not just through your ears, but through every pore of your skin.

Glossary:

Harpischord- a keyboard instrument used chiefly in European classical music of the 16th to 18th centuries where the stings are plucked by points of quill, leather or plastic

Area summary: A healthy body resonates at its maximum potential because the symphony of its parts is in harmony. Emotional blockages and traumas are stored in the connective tissue of the body. These blockages are stored in such as way that they dampen the body's natural resonating frequency. Just as a violin string will come to life when the identical note is struck on a piano, the body's symphony will come alive when its music is played. The music in this course can be used to tune and reinstate health and well being through the phenomena of sympathetic resonance.

INNER SOUND Professional Distance Training

Test Questions: Section 2

How Sound Heals

Circle or check the correct answers.

1: Physics of Sound

1. True/False Some sounds are the result of vibration.

2. Waves
a. always move towards the source
b. always move away from the source
c. cause hearing problems
d. can not be described in numbers
e. none of the above

3. True/False Anything that has mass can vibrate.

4. True/False When something vibrates in a vacuum the resultant sound has a higher volume.

5. Vibration is
a. a cyclic movement
b. a movement alternating in 2 opposing directions
c. the source of all sound
d. all of the above
e. none of the above

6. Frequency and pitch
a. vary inversely
b. vary directly
c. are the same thing
d. none of the above

7. True/False Tuning forks create longitudinal waves.

8. True/False Pitch is a relative characteristic that is judged by the ear.

9. True/False Only musical instruments are used in therapeutic work.

10. True/False Linear harmonics include a fundamental and overtones.

11. True/False The harmonics of a violin are whole number multiples.

Draw a line from the instrument to the kind of harmonics it produces:

Bells	
Flute	Linear Harmonic Spectrum
Gongs	
Violin	
Xylophone	
French Horn	Non Linear Harminic Spectrum
Tympani	
Drums	
Digeridu	
Clarinet	

12. True/False It may not be possible to identify a specific note from the sound of a non-linear harmonic instrument.

13. True/False The number and strength of the overtones give us the information we need to identify sound quality or timbre.

14. Sounds with few harmonics are
a. resonant or rich
b. interesting
c. uninteresting
d. a and b

15. True/False The fundamental is almost always the loudest harmonic of any note.

16. For humans to hear a sound the source must be
a. a frequency in excess of 20 Hz
b. below 20 Hz
c. above 20,000 Hz
d. below 20,000 Hz
e. b and c
f. a and d

17. True/False A wave is the disturbance of a medium such as air, water or a solid.

18. True/False Sympathetic resonance is the tendency for an object or a system to vibrate from a wide range of frequency inputs.

19. True/False Normally, amplitude increases with time.

20. Transverse waves
a. move in the same direction of the wave
b. cause volume to vary
c. move at right angles to the direction of the waves
d. none of the above

21. True/False When similar wave forms combine they add to or subtract from each other.

22. True/False Beats will normally produce a sound that periodically grows and diminishes in volume.

23. Musical sounds can be
a. complex waveforms
b. broken down into a number of sine waves
c. all of the above
d. none of the above

24. True/False Resonance is the response of one object or system to a periodic force.

2: Effect of sound on biological functions of the body

1. True/False The connective tissue is located only in the upper torso.

2. True/False Connective tissue is involved in the exchange of nutrients and waste at a cellular level.

3. True/False There is a continuous net in the body formed by connective tissue, cyto-skeletons and DNA.

4. True/False Bio-molecular material can not conduct vibration.

5. True/False Phonons are converted sound waves.

6. True/False Coherent waveforms have a similar phase direction and amplitude.

7. True/False Sound is not able to arrive to the nuclei of the body's cells.

8. The living matrix is formed by
a. connective tissue, cyto-skeletons and genetic material
b. the nervous system
c. the cardiovascular system
d. none of the above

9. True/False The living matrix acts upon basic healing processes in the body.

10. True/False The acupuncture meridians are minor pathways through the body.

3: Effect of Sound on the physiology of the body

1. True/False Loudness is measured in decibels per seconds.

2. True/False Only the ear is involved in our hearing process.

3. True/False There are 2 bones in the inner ear that transmit the sound from the eardrum to the oval window.

4. True/False The cochlea responds to frequencies between 20 and 22,000 Hz.

5. True/False We hear our own voice through bone conduction.

6. True/False The cochlear nerve transmits impulses to the hearing center of the brain.

7. True/False High frequency sounds affect all the hair cells along the basilar membrane.

8. True/False A person's voice can produce frequencies from 20 to 1,100 hz.

9. True/False High-pitched sounds have higher frequencies than low-pitched sounds.

10. True/False In wind instruments the shorter the column of air, the lower the frequency.

11. True/False The loudness of a sound measured by the ear is relative to frequency.

12. True/False Most of the joints in the body inhibit the transmission of sound.

13. True/False The body does not have any resonant frequencies.

Draw a line from the word in the first column to its definition in the second column

Decibel	transmits vibrations to the stapes
Pinna	part of the cochlea
Malleus	produces nerve impulses in response to sound
Incus	a measurement of sound volume
Stapes	transmits vibrations to the incus
Basilar membrane	part of the ear
Organ of Corti	transmits vibrations to the inner ear
Tectorial membrane	part of the Organ of Corti
Cochlea	the spiral cavity of the inner ear

4: Effect of sound on the nervous system (Psychoacoustics)

1. True/False Unobstructed free sounds tend to grow in volume.

2. True/False All objects reflect sound equally.

3. When the resonant frequency of an object is equal to the frequency of a sound
a. it will dampen the sound
b. it will begin to vibrate
c. it will change the frequency of the sound
d. none of the above

4. True/False The body absorbs all frequencies equally.

5. True/False The pinna acts as a filter for incoming sound.

6. True/False Normally, the sound that arrives to the 2 ears is quite different.

7. True/False The ear canal is a resonating chamber.

8. True/False A sound at its source and at the eardrum is nearly equal.

9. True/False Stereo recordings reproduce sound events accurately.

10. True/False Each individual's body filters and amplifies sound in a unique way.

11. True/False Our ability to accurately recognize small variations in pitch depends in part on our memory.

12. True/False The body has various ways to filter sound in order to derive the location of the source.
13. True/False It is possible to activate the 2 hemispheres of the brain with specifically filtered sound.

14. True/False Sound can not be used to stimulate awareness.

15. True/False The reticular formation in the brain is connected to our motor functions.

16. True/False Volume can be used to determine the distance to an object.

17. True/False Stereo recordings include all spatial information of a sound.

18. True/False Stress in the nervous system can be created by a lack of the spatial information of a sound.

19. True/False Binaural beats are produced when you have 2 drummers playing the same song.

20. True/False A difference frequency is the sum of 2 tones.

21. True/False The frequency of harmonics in equal temperment will not be equal.

22. True/False Equal temperment is the tuning best suited for all sound healing work.

5: Theory and function of the emotions

1. True/False The expression of the emotions in humans is unique in the animal kingdom.

2. What is common across cultures in respect to the expression of emotion is
a. the specific stimuli which activates a given emotion
b. the time of day when certain emotions are activated
c. specific emotional response patterns once an emotion has been activated
d. none of the above

3. True/False Each emotion has its own specific cycling time.

4. True/False Uncompleted emotions have no importance to the body.

5. True/False Our emotional defenses make it safe to express emotion.

6. True/False Emotional defenses come from our past experiences.

7. True/False Potential growth can be affected adversely by our emotional defenses.

8. True/False You should never listen to music you do not like.

9. True/False People should only listen to the music common to their birthplace.

10. True/False Music can be used to create a greater contact within.

11. True/False The activation of the emotions by music is a counter-indication for its use.

Draw a line from the word or phrase in the first column to its meaning in the second column

Central nervous system	the brain and spinal cord
Homo sapiens	having a backbone
Vertebrates	all humans

6: Effect of Sound on the Emotions

1. True/False The body only vibrates at the sub-atomic level.

2. True/False Ligands are neurotransmitters.

3. True/False Peptides activate the cells by vibrating into place with the receptors on the cell surface.

4. True/False The central nervous system is the only communication system in the body.

5. True/False Childhood traumas can affect our lives at many different levels.

6. True/False Inner Sound motifs affect specific areas of the body.

7. True/False Sound waves are converted in the body into heat, light and electrical fields.

Draw a line from the word or phrase in the first column to its meaning in the right column.

Ligand	sex hormones
Receptor	transfers nerve impulses sensing
Neurotransmitters	molecules on the surface of cells
Steroids	peptides
Peptides	organic substances with molecules similar to but smaller than proteins

7: Field Theory

1. True/False The field theory looks at the energy radiating and discharging from the body as well as energy patterns in the body.

2. True/False The electrical bonding in the cells in the body can never be too strong.

3. In the field theory
a. balance is always a dynamic process.
b. balance is when 2 opposing forces come to rest
c. balance is when we stand upright
d. balance is when we are laying down
e. None of the above

4. True/False Music and sound are incoherent fields that can create a positive influence on the body.

5. True/False The element of time is as important to our dynamic balance as are the physical elements involved.

6. True/False A specific sound or tone will always have the same effect on the body.

7. True/False The field theory deals with what happens in the body from the core out to the skin.

8. True/False The EMF is a homogeneous field without having any specific areas of importance.
9. True/False Energy flows both inside and outside the body.

10. True/False There is a correlation between the electromagnetic field and the acupuncture meridians.

11. INNER SOUND describes the EMF
a. as 220 volts AC, 50 Hz
b. as a specific color emanating from the body
c. as the source of static balance
d. as 7 basic energy matrixes
e. all of the above

Draw a line from the word or phrase in the left column to its meaning in the right column

Coherent field pattern	organized pattern
Epidermis	Sanskrit word
Kirlian photgraphy	any atom or group of atoms that bears one or more positive or negative electrical charges
Ions	partial image of radiant energy
Chakras	the skin
Infrared	having a wavelength shorter than that of the violet end of the visible light spectrum
Ultraviolet	having a wavelength just greater than that of the red end of the visible light spectrum

8: Acoustic and electronically produced sounds

1. True/False Acoustic instruments often incorporate vibrating strings or columns of air.

2. True/False Electronic instruments normally require headphones or speakers in order to deliver sound through the air.

3. True/False A sampler is a CD with a collection of different music on it.

4. True/False There are 2 kinds of recordings, acoustic and electronic.

Draw a line from the word or phrase in the left column to its meaning in the right column

Synthesizer	a digital recorder
Samplers	an audio signal processor
Tone generators	converts analogue signal to digital code
Digital recorder	oscillators

9: Where instruments resonate

1. True/False A periodic disturbance of particles radiating out from its source creates a sound wave.

2. True/False Timbre and range are characteristic of speaker systems.

3. True/False All sounds reach the same parts of the body.

4. True/False The piano has the largest range of the more common instruments.

5. True/False The harp creates more activation in the emotional system than in the body and the mind.

6. True/False The timbre of the violin is particularly attuned to the emotions of the heart.

7. True/False The woodwinds enhance the expression of emotions.

8. True/False All brass instruments resonate in the torso of the body.

9. True/False There is no safe way to listen to rock music.

10. True/False The same sounds or instruments will always be felt in the same parts of the body.

Name:_____ (for your records only. When submitting forms for certification, use a code, etc to protect privacy of client.) Date: _____

Age: _____ Time of day session started: _____

Contact info:_____

Desired goal or theme: _____

Rings of Sensitivity: yes no Basic Long:___ Basic Short: ___ Pair 5: _____(specify # of crossings and when in session used)
Personal Tuners:___ Matrices 1 2 3 4 5 6 7 OM Tuners:___

Length of treatment: _____ Average activation per side:_____

Client's Comments:_____

Observations(Anything you observed during the application of tuning forks):_____

Assessment (If you feel tuning fork elements were well-chosen, etc/What would you do in the next session?) and Comments (including why matrix was chosen....):_____

Any over-activation symptoms (check, underline or circle):
1. Ear pressure 2. Headache not present before session 3. Tuning fork(s) still heard after session
4. Other (Describe)

Pain level client assesses (Circle number):
Before session 1 2 3 4 5 6 7 8 9 10 After session 1 2 3 4 5 6 7 8 9 10
(1 = no pain, 10 = high pain)

Stress level client assesses (Circle number):
Before session 1 2 3 4 5 6 7 8 9 10 After session 1 2 3 4 5 6 7 8 9 10
(1 = no stress, 10 = high stress)

ADVANCED CERTIFICATION

CERTIFICATION REQUIREMENTS
INNER SOUND Tuning Fork Practitioner- Advanced

(NO DEADLINE FOR COMPLETION)

1. Complete the Advanced exam questions on Advanced page 15 of this manual or found on Advanced page 27 of the TF Basic & Advanced training manual.
2. Follow 3 different individuals through a minimum of 15 sessions each completing an Advanced Session Form (Advanced page 16 of this manual) for each session. Apply the tuning forks based on the desired goal of the individual and any over-activation symptoms experienced. Use whatever combination of tuning forks from both the Basic and Advanced trainings that you feel is appropriate**. Follow the individual.** You are not required to use motifs in the sessions unless it is appropriate to help the individual resolve the issue(s) they are seeking help with. Follow the individual.
3. Apply on self all the motifs in order with no other elements with at least 24 hours between applications. Document the experience on the Advanced Session Form, one per motif.
4. Choose a theme to focus on and follow self for 15 sessions, documenting each session on the Advanced Session Form. Use whatever combination of tuning forks **from both the Basic and Advanced trainings** that you feel is appropriate. Follow yourself.
5. Oral interview - Technique exam (This is a repeat of the Basic exam plus the Contact Motif. See page 2a of this manual) / Review of Advanced Tuning Fork exam.

Submission guidelines:

Contact Arden Wilken, arden@innersoundonline.com,
to schedule technique exam & oral interview.
Email the items listed below to
info@innersoundonline.com

1. All 3 cases including a brief summary of each. Include an assessment of overall alleviation of symptoms for each case. (For privacy reasons do not submit names or contact info. Use initials or numbering code for each individual.)
2. Session forms of Motif self applications with brief summary of experience.
3. Session forms of 15 self sessions with brief summary of experience.
4. Advanced Tuning Fork exam from page 15 of this manual.

Cost of certification: $150

Keeping active and up to date- every 4 years
1. Retake 1 day of Basic course. Cost 1/2 current price.
2. Retake any previously taken INNER SOUND course (optional) at ½ current price.

Exam for Certification of INNER SOUND Tuning Forks Advanced Level

(Circle the correct answer.)

1. The following is not a circumstance that indicates the use of INNER SOUND Motifs:
a) after a Basic Short or Long treatment.
b) when the person feels very unbalanced.
c) if a longer treatment can not be done for any reason.
d) as a complement to a traditional or alternative treatment or therapy.

2. Apply each pair indicated for each motif with the lowest frequency tuning fork at the left ear. True/False

3. Use the motifs in alphabetical order. True/False

4. Any motif can be repeated more than once. True/False

5. For best results use the motifs only. True/False

6. ELAs are recommended for closing a session. True/False

7. When using a motif with Basic elements, the motif always comes at the beginning of the session. True/False

8. Only choose motifs based on the Motif Protocol Sheet. True/False

Name:_____(for your records only. When submitting forms for certification, use a code, etc to protect privacy of client.) Date: _____
Age: _____ Time of day: _____Contact info: _____
Desired goal or theme: _____

Overall length of session: _____Rings of Sensitivity: yes no Motifs used with Basic Long:___ Basic Short: ___ Pair 5: _____(specify # of crossings and when in session used)
Personal Tuners:___ OM Tuners:__ Matrices 1 2 3 4 5 6 7 Matrices used alone ____
Average activation time for each pair_____
(Circle which motif(s) used)
Alpha Motif
Birth Motif
Centering Motif
Child Motif
Cleaning Motif
Conception Motif
Contact Motif
Contraction Motif
ELA Motifs
Expansion Motif
Foot Stimulation Motif
Front Back Alignment
Grounding Motif
Hemispheric Balance Motif
Integration Motif
Left/Right Balance Motif
Opening Motif
Theta Motif
Hope Motif

Client Reaction:

Observations made during session:

Assessment and Comments:

Over activation Symptoms?

Pain level client assesses (Circle number):
Before session 1 2 3 4 5 6 7 8 9 10 After session 1 2 3 4 5 6 7 8 9 10

Stress level client assesses (Circle number):
Before session 1 2 3 4 5 6 7 8 9 10 After session 1 2 3 4 5 6 7 8 9 10