

## **TINNITUS: a problem that can be solved**

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### **Introduction:**

“Tinnitus” (medical word from Latin) or “Acufene” (from Greek) is the perception of sounds, ringing, hissing or any other sound when no other external sound is present. Practically everyone had experience of tinnitus just like a temporary nuisance, but, for millions of people it is a life altering condition.

Many patients are so seriously debilitated with this problem to ask for medical assistance because they cannot have a normal life.

Still on our days we can found physicians who say to the patients with tinnitus that there is nothing to do for their problem and that they have to live with! But it is not so anymore!

The exact physiological causes of tinnitus are not well known but we begin to understand many things and I have my personal description of the neuro physiological origin.

Diagnosis and treatment of tinnitus started in the 1st millennium BCE: ancient Mesopotamian medical text, written in Sumerian (2112-2004 BCE), began to include descriptions of signs and symptoms and/or diagnoses with instructions for the preparation of medications.

Tinnitus therapy and cognitive behavioural therapy for idiopathic tinnitus from Hippocratic physicians was based in reassuring the patient that his symptoms were amenable to treatment and at involving him in his own cure.

The plants use by Assyro- Babylonian physicians had properties that can help to treat the tinnitus itself: Vitamin A and B, zinc, vasodilators, antihistamines and drugs that increase the activity of intracellular antioxidant enzymes.

After more than ten years of research (first at the Faculty of Medicine of the Rome University “La Sapienza” and then now at personal tinnitus research centre), we had solved more of 80% of tinnitus problems considered.

There are some likely sources known to trigger or worsen tinnitus: noise induced hearing loss (90% of tinnitus patients), wax in the ear canal, ear or sinus infections, cardiovascular disease, jaw misalignment, thyroid disorders, mechanical trauma (head and neck), Ménière’s disease (with violent attack of vertigo), acoustic neurinoma, etc. but for the so called idiopathic tinnitus the real cause start with important “distress” conditions.

We say that the Tinnitus can have two main origins:

1. Extrinsic: vascular cause, muscular, from secretion, from joints and arthritis, otosclerosis, etc.
2. Intrinsic o “idiopathic”: identifiable as hearing neuro-sensorial origin or without apparent cause.

With Extrinsic tinnitus we have to follow the traditional medical approach (clinic, pharmacological or surgical), but often, eliminated the original cause, tinnitus is not cancelled.

With Intrinsic or “idiopathic” tinnitus we got very good results with our “Tinnitus Integrated Program” TIP.

Therapy started on the deep analysis of the global hearing mechanism.

### **The Tinnitus origin:**

We have to start with Anthropology " $\alpha\nu\delta\rho\omega\pi\omicron\sigma$ ", man, and " $\lambda\omicron\gamma\omicron\sigma$ ", talk, it is the science that studies the human being in all his socio-cultural and physical aspects.

Every living being interact with the external (and internal) environment with the senses (environmental physical and chemical transducers).

The perception happens through brains mechanism (cybernetic filters) and is influenced by the main memory and by the human culture and knowledge.

A negative perception can induce a dangerous stress called “distress” with interference with the good health and the quality of life.

Every organism is a living system that acts to reach a purpose: the first is the survival.

### **Mind and brain**

The lively control centre is the brain (not the heart): all the information and the bio cybernetics controls, across a neural net, are processed and managed by the brain.

The brain, this fascinating organ of the “Homo sapiens”, is made up of a grey mass of about 1.5 kilos, in which there are more than 100 billion of nervous cell (the neurons) that support all our cognitive functions: each neuron (long from few millimeters to one meter) have more than 10.000 connections with other neurons: it is a network with cosmic dimensions.

Any thought, any sentiment, any movement, any remind in our live grows up in our brain: a system distributed in a “net” that develops in a “spider's web” with “knots” capable to communicate, amplify, interact, save, process the live data.

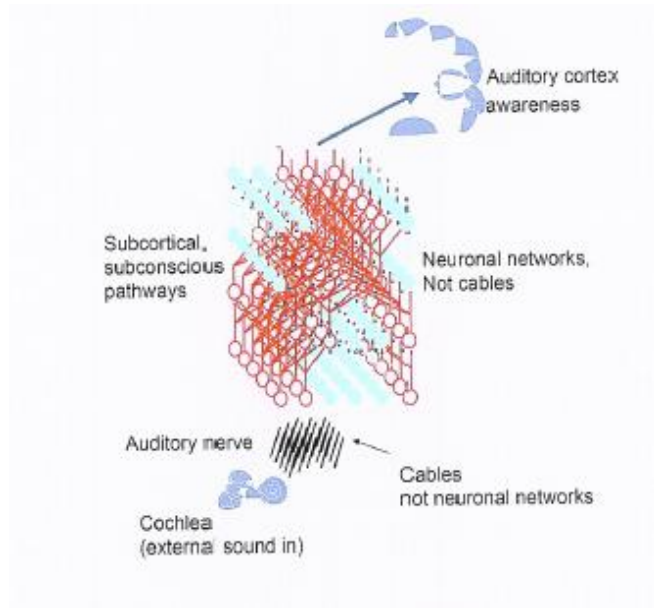
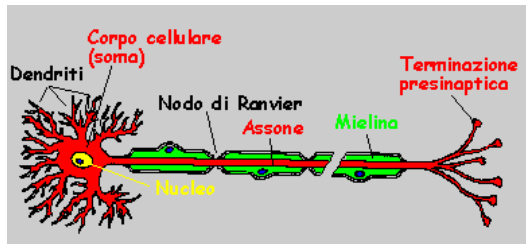
### **The perception**

The complex elaboration of neuro sensorial processing happens in the area of our brain called “limbic area” where the perception of the environment is modified or supported by the emotions.

The analysis, the selection and the filter of the sensorial information's starts in the limbic area.

This function is linked to our main memory: a comparison process tells us if an information is important, useful or not, and then is transmitted to our perception on the cortical area of the brain.

To all these information recorded in our “data bank” (our memory) during all our live (sound and vibrations are perceived some months before the conception) and to them we associate the environmental data and the linked emotions.



### The senses and the “filter”

All the information coming from our senses (eyesight, hearing, balance, touch, taste, sense of smell) go through many elaborations “stations” or “knots” in our neuronal net.

Such electrochemical impulses pass in the limbic area or system before to reach the cortical area for the perception.

Especially our hearing and smell senses are closely linked with the brain area that controls the emotional aspects of our relationship live and with those that cause automatic answers of our organism to any danger, the so called “alarm reaction” (limbic area and the autonomous or neuro vegetative system).

Billions of information’s from our senses reach the brain: data from the environment (internal and external), complex electrochemical images that have to be analyzed and filtered from our limbic system to avoid an overload of our perceptions (as can happen for an autistic subject).

The filter works on this billion of data across a comparison process of the information with the “memory data bank” to extract, first of all, any communication of danger and, then, everything that gives us something “interesting”.

The “plasticity” of our brain allows us to take action on this filter, normally unconscious: we can avoid the background noise in a noisy environment during a conversation or a mother who wakes up when hears the crying of their children (crying is recorded as important signal).

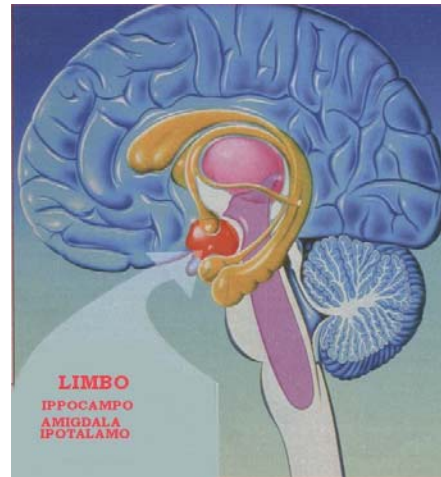
### Alarm reaction

Neuro physiological and psychological alarm reaction is automatically generated by a “stressor”.

A disease or a hearing problem are stressors: some time happens that, eliminated the cause of the disease, the problem can remain, because we can record in our memory the alarm signal linked with the disease.

Idiopathic tinnitus, fear, terror, hallucinations, depression can have such origin.

The stressor, across our neuronal network, produce on the neuro vegetative system and on the hypothalamus – hypophysis area some hormonal modifications with introduction of adrenalin and noradrenalin.



### Territory, space and life environment

The pollution perceived outside of our space, generally, does not cause annoyance, but, in our life environment (as home, car, office, brain, ...) our reactions are very strong: it is a distress reaction of alarm and defense.

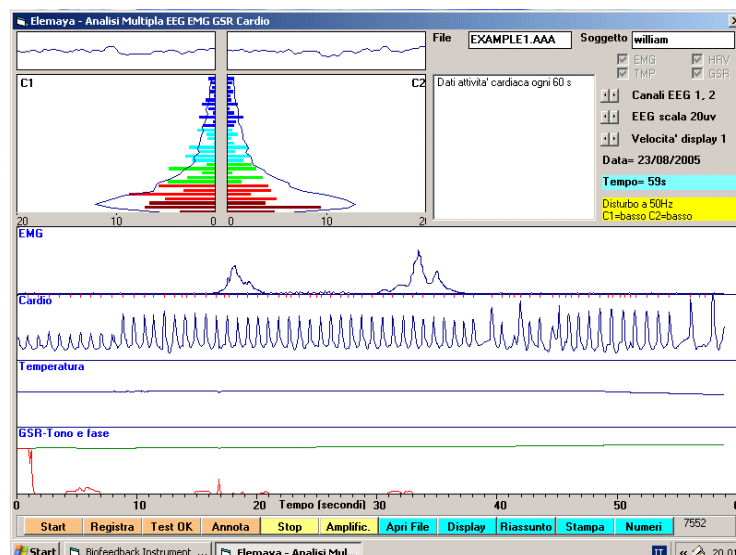
Such invasion of our vital space can be seen with the brain wave EEG, especially with biofeedback approach and frequency analysis:

ALFA waves (8-12 Hz): relax, creativity, best performance on sport and at school

BETA waves (13-30 Hz): mental concentration

K o GAMMA waves (>30 Hz): loss of reality sense, tachycardia, euphoria, physical resistance (as from alcohol or amphetamines).

With the biofeedback we can helps people to understand the effects of stress on their performance and teach them how to manage this stress to optimize performance and improve health.



## Stress

The Health and Safety British Commission (HSC, 1999) said that the stress is the reaction that persons show if exposed to excessive psychophysical pressings.

At the dawning of humanity, the stress reaction helped our ancestors to survive: through the senses they noticed the impending and they drew up in advance the organism to escape or to fight.

Our DNA record as long as we evolve the stress capability and, also if the causes of danger are not the same, we still have the analogous capacity of stress reaction.

Such reaction, genetically established, cannot change easily, and then, if a distress effects our life for long time, the result is a pathology: physical, behave, mental problems.

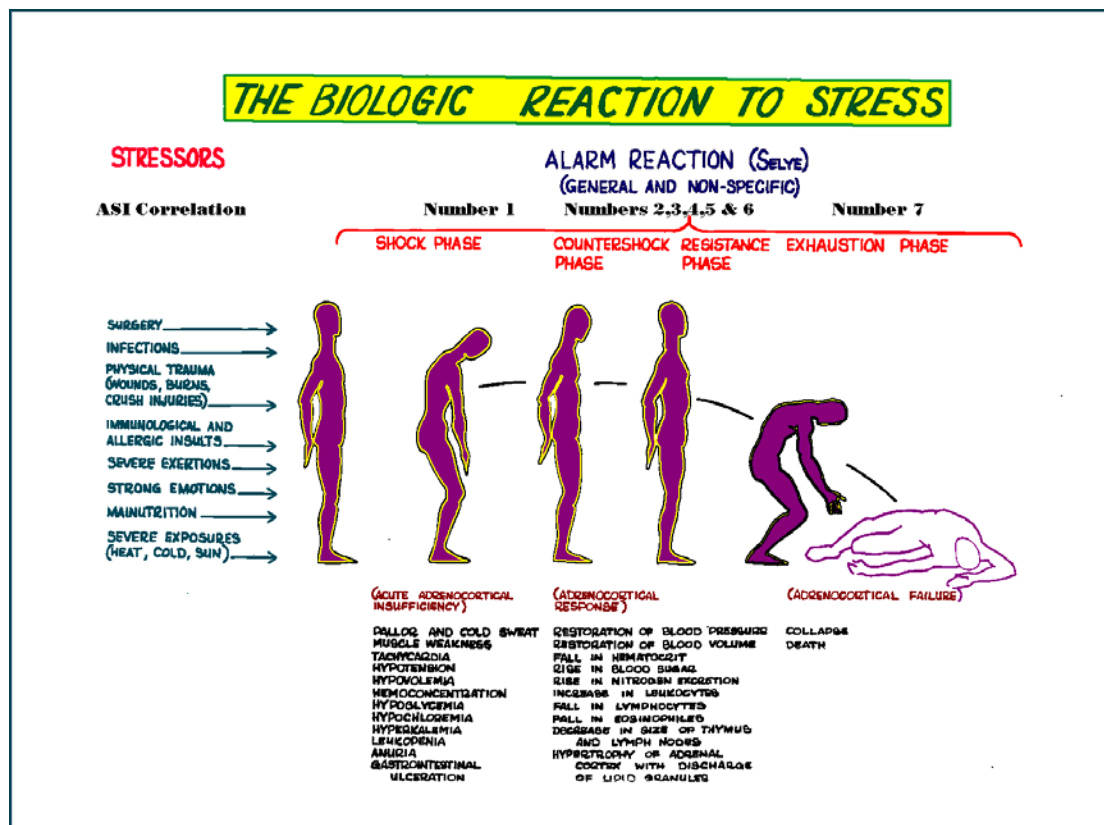
Many persons exposed to distress factors catch emotional reaction of anxiety, depression, embarrassment, fatigue, and with physiological reaction on internal organs, high blood pressure, tachycardia, muscular stiffening, neck and shoulders pain, stomach pain and heartburn.

People under stress have difficulties to concentrate, to take a decision, to rest, to remember, to save and to learn new things, to be creative, to have a normal life.

The exhibition to stress factors can stimulate behaviour that endanger health and social relationship: aggressiveness against neighbour, inexplicable criminal and violent actions.

We have biological reactions to stressors (alarm reactions):

1) Shock, 2) Reaction, 3) Resistance, 4) Exhaustion.



## **Conclusion: Tinnitus is a problem that can be solved!**

### **Tinnitus therapy: Rehabilitation to hearing (sound therapy) and mind plasticity.**

The perceived sound can be a source of stress and can be recorded in the brain as “dangerous”; then it is recorded in our main memory and very difficult to cancel.

It is the “limbic” area or system, where all our senses are passing through, especially the acoustical signals, and where we have the control center of our memory and vegetative nervous system.

The impulses travel through some shunting stations to the brain (central and cortical path) where we have the “detection” of the acoustical signal.

Tinnitus can be heard in the “perception” area coming from where we have the “emotions”: as we know sound and external acoustical signals are first codified at cochlear synaptic level in electrochemical impulses and transmitted to the VIII acoustical nerve, then the signals travel in the net of the brain network, filtered and recorded.

A psychological and neurological rehabilitation therapy is implemented in a multifactor’s approach and can give health and offer a new normal quality of life to which all of us have right!

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