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TINNITUS: THE PHANTOM SOUND (PART V) PSYCHOLOGICAL ASPECTS – VOLUME 1

Lisiane Holdefer, Piotr Henryk Skarzynski and Milaine Dominici Sanfins

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This month's newsletter is about some psychological aspects of tinnitus. We invite you to read the previous bulletins so that you can understand this auditory symptom in greater depth.

- **Part I** – Tinnitus: The Phantom Sound (Garcia, Skarzynski e Sanfins, 2023)
- **Part II** - Auditory evoked potentials of short latency (Sanfins, Soares e Skarzynski, 2023)
- **Part III** - Pharmacological treatment of tinnitus (Skarzynska, Skarzynski e Sanfins, 2023)
- **Part IV** - Does neuromodulation really have a beneficial and scientifically proven role in cases of tinnitus? (Sanfins, Skarzynski, Barros, 2025)

We start this 5th bulletin on the topic with a question.

WHAT IS THE RELATIONSHIP BETWEEN TINNITUS AND PSYCHOLOGICAL HEALTH?

Some individuals with tinnitus can experience significant impacts on their psychological health. However, the relationship between psychological problems and tinnitus is complex, although studies have shown that there is a strong correlation.

We need to understand that tinnitus is a symptom and not a disease, and this has major implications for understanding the psychology. In particular, when there is an established and defined disease, the patient can go in search of a form of treatment aimed at curing the problem, but this is not the case with tinnitus.

From this point of view, the presence of an unpleasant sound that manifests itself in different ways becomes a serious challenge and often results in various forms of suffering. Such a perspective reframes the psychological question, so it is not just a matter of dealing with an illness but of facing a persistent and often uncontrollable sensory phenomenon, the root cause of which may not be found.

This perspective emphasizes the importance of psychological interventions that focus on habituation and reducing distress, rather than just trying to eliminate the sound, which is not always possible. The psychological burden thus becomes a significant secondary condition, even if the primary cause is resolved or untreatable, and so psychological support becomes a central part of treatment.

It is relevant to mention here that there is a distinction between everyday tinnitus and tinnitus disorder, where the latter is accompanied by intense suffering, changes in mood, cognition, or behavior, or autonomic dysfunction.

Still on the categorization of tinnitus, a distinction should also be made between objective and subjective types of tinnitus.

Target Buzz:

Objective tinnitus means that it is possible, under certain circumstances, for the sound to be heard by the health professional during an evaluation, perhaps with the simple use of a stethoscope.

Although uncommon, objective tinnitus accounts for approximately 10% of tinnitus-related queries. Commonly, it is a pulsatile sound that accompanies the heartbeat, and is often linked to vascular changes such as narrowing, dilation, or other anomalies in the arteries.

When the cause is properly identified, surgical interventions or specific treatments can often solve the problem entirely.

Subjective Buzz:

Subjective tinnitus, on the other hand, is by far the most common type. In this case, the sound is perceived exclusively by the patient, and there is no identifiable external source.

It affects about 1 in 5 adults, with the incidence increasing with age, reaching 30% in people over 50 years old. In some cases, the tinnitus is temporary and disappears spontaneously within a few hours, days, or weeks. However, if it persists for 3 months or more, it is considered chronic and the likelihood of spontaneous remission becomes much lower.

It is estimated that approximately 14% of the adult population suffer from tinnitus. Patients often report anxiety, depression, sleep disturbances, suicidal thoughts, self-harm, and decreased quality of life. Even with advances in therapeutic strategies, there is still no definitive solution that eliminates subjective tinnitus in a guaranteed way. However, several approaches help to reduce discomfort and improve quality of life.

Experiencing the tinnitus

It is estimated that between 1% and 3% of the population lives with a degree of tinnitus that is intense enough to generate emotional and functional impairments. **Living with tinnitus is, for many, like living with an invisible sound: present all the time, without a clear source, without a pause**. But what was once seen only as an auditory consequence, is now understood as an experience which is deeply influenced by the brain, emotions, and personality of the individual. **Science now reveals that tinnitus is not just a sound in the ears, but a complex brain experience — a biopsychosocial phenomenon**.

Tinnitus and the brain – is there a correlation?

Tinnitus usually originates from a peripheral hearing loss, but its maintenance and amplification occur in the brain. Research in functional neuroimaging shows that extrasensory areas — such as the prefrontal cortex, the limbic system (involved with emotions), and the insula — actively participate in the perception of tinnitus (Schlee et al., 2009). This explains why people with the same type of hearing loss can have very different experiences: while some adapt well to sound, others suffer intensely.

In addition, hyperconnectivity is observed between auditory and emotional regions, such as the amygdala, hippocampus, and anterior cingulate cortex. This connection is directly related to the emotional valence attributed to tinnitus — that is, to the way the sound is interpreted: whether threatening, bothersome, or neutral.

Personality: how the psychological profile shapes the experience of tinnitus

Studies have indicated that personality traits are directly associated with the way the individual perceives and reacts to tinnitus. Problematic traits may be:

- perfectionism;
- neuroticism (tendency to experience negative emotions);
- Low frustration tolerance;
- Tendency towards rumination — (those who get stuck in repetitive and negative thoughts tend to perceive tinnitus as more intense and invasive);
- individuals with a tendency to body hypervigilance (any small physical or auditory sensation is magnified, interpreted as a danger signal, and obsessively monitored).

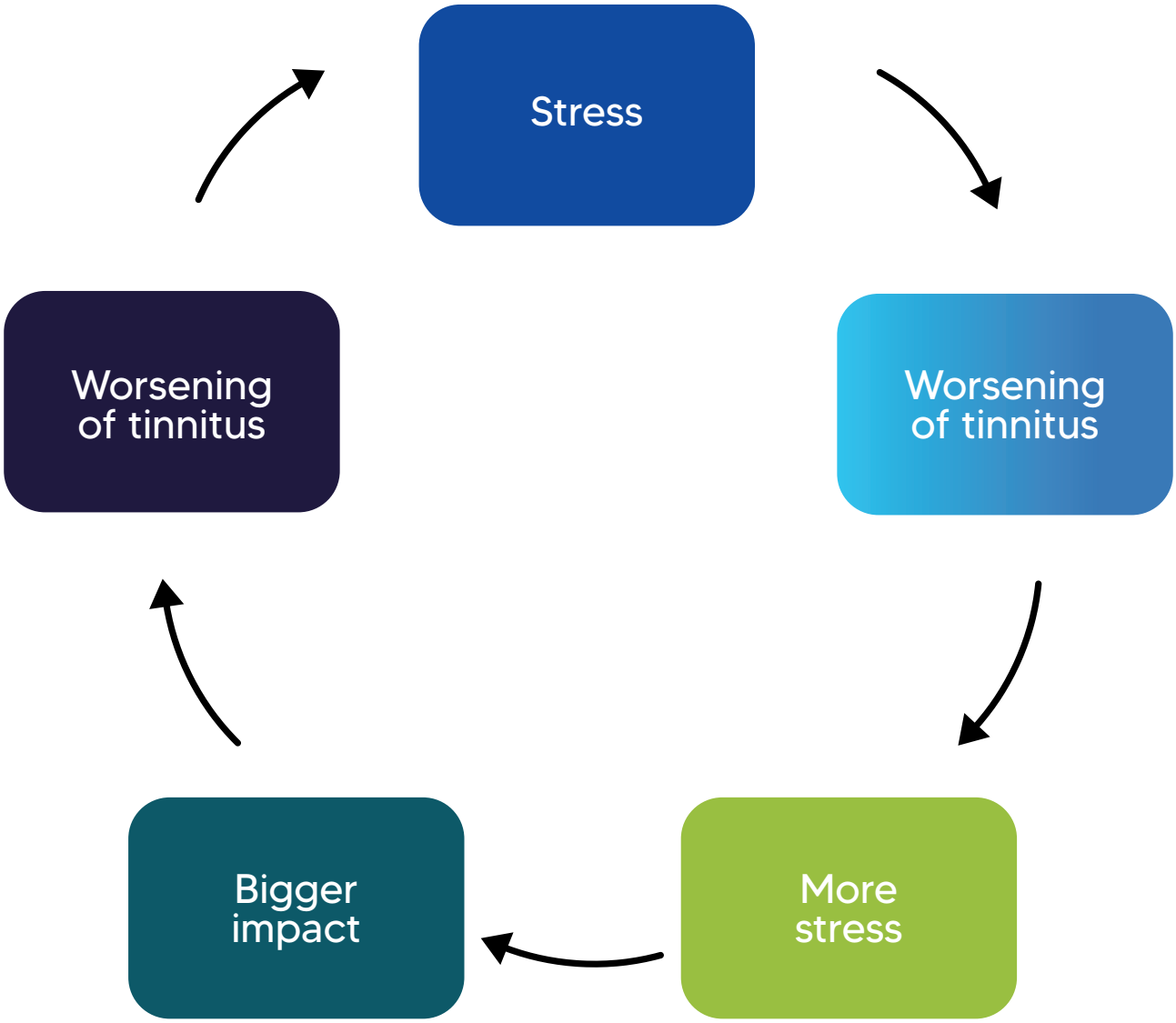
This can be explained by the finding that hyperactivity of the alert system is more common in people who suffer from chronic disabling tinnitus (Langguth et al., 2007).

The hypothalamic-pituitary-adrenal (HPA) axis and chronic stress: the body in a state of alarm

Another crucial factor in understanding tinnitus is the role of chronic stress and the hypothalamic-pituitary-adrenal (HPA) axis. What is the HPA axis?

The HPA axis is the biological system responsible for orchestrating the stress response and activating the release of cortisol. In people with disabling tinnitus, it is common to find alterations in the functioning of this axis – especially a prolonged or dysregulated release of cortisol (Simoens & Hébert, 2012).

Prolonged exposure to stress continuously activates the amygdala (the emotional center of the brain) and weakens areas such as the prefrontal cortex, which is responsible for rational control and emotional regulation. This imbalance favors the intensification of the perception of tinnitus and the feeling of a lack of control, feeding a vicious cycle:



While tinnitus is perceived in the ear or head, its real suffering dwells elsewhere: in the brain connections that involve emotion, attention control, and mental states. The presence of psychic disorders, such as anxiety, depression, and obsessive-compulsive disorder (OCD), is much more than a comorbidity: they modulate the way the brain interprets and reacts to tinnitus.

Anxiety and tinnitus: when the threat comes from within

Generalized anxiety disorder, specific phobias, social anxiety, and even panic attacks are often reported among people with tinnitus. **A study conducted by Pattyn et al. (2016) identified that high levels of anxiety are significantly associated with the severity of tinnitus perception, regardless of the degree of hearing loss**.

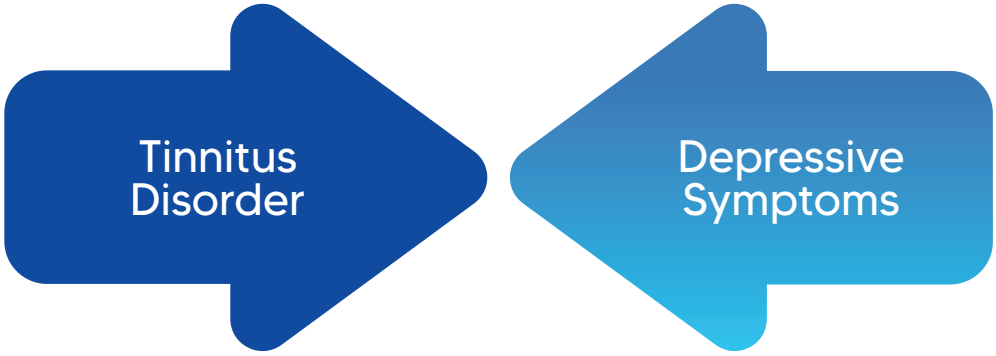
This is due to the way the nervous system handles the tinnitus signal. Anxious people tend to interpret any uncomfortable sensation as a possible danger sign. At that point, attention turns excessively to the sound – intensifying its perception. This mechanism, known as "auditory hypervigilance," contributes to the maintenance cycle of tinnitus: the more you try to ignore it, the more it seems to grow.

In addition, chronic anxiety keeps the sympathetic system on constant alert, hindering habituation processes — that is, the brain's ability to "get used to" sound.

Depression and tinnitus: sound as a mirror of internal suffering

Depression is one of the most frequently associated comorbidities of tinnitus. Patients with depressive conditions report greater functional interference of tinnitus in their quality of life, sleep, concentration, and well-being (Zöger et al., 2006).

The relationship is bidirectional: the distress caused by tinnitus can trigger depressive symptoms, but there is also evidence that pre-existing depression can increase the perception of tinnitus. This occurs, in part, due to changes in the dopaminergic and serotonergic systems — neurotransmitters that are fundamental in the regulation of mood, motivation, and sensory perception..

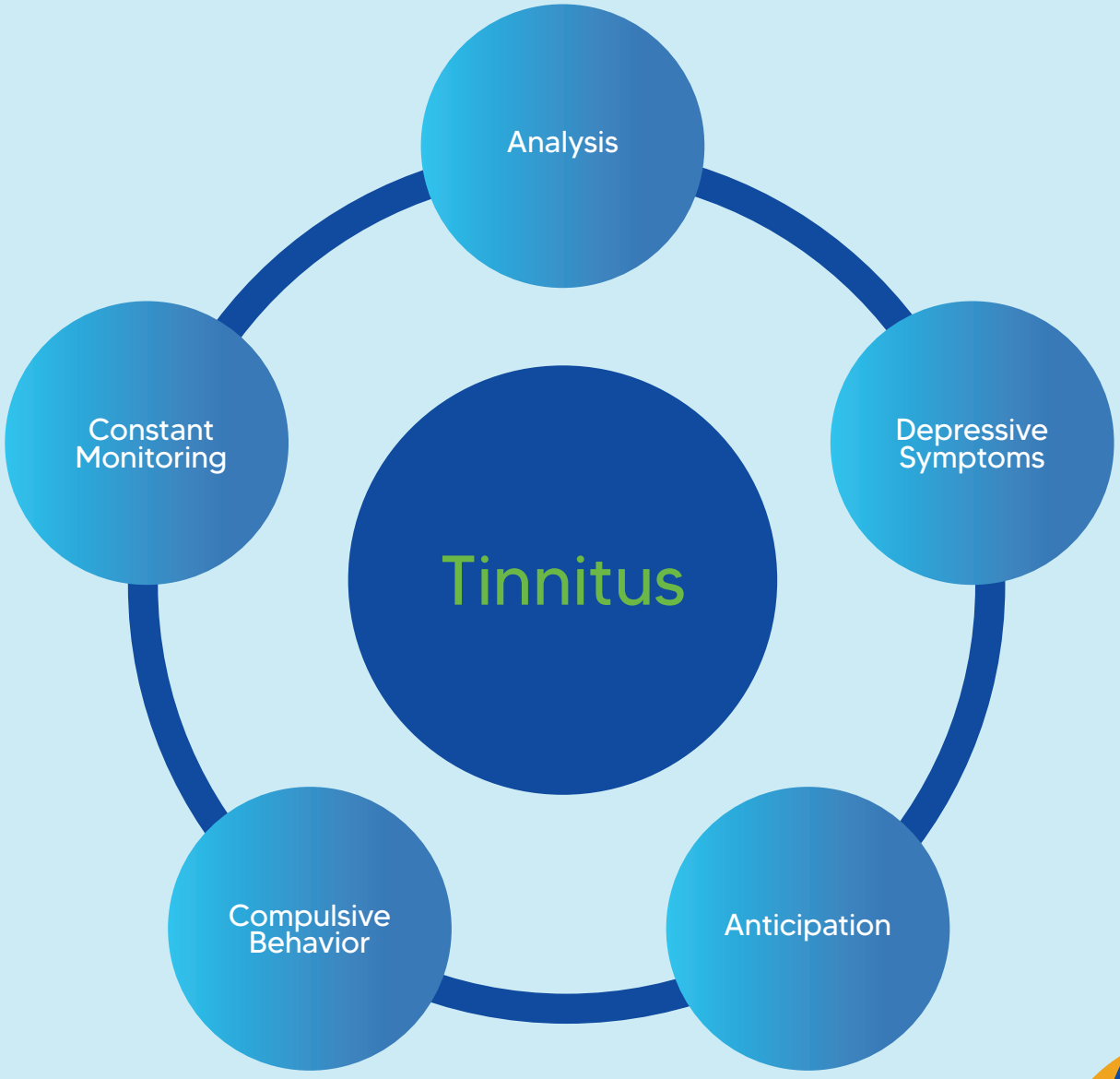


Depressed patients have less activity in the dorsolateral prefrontal cortex, an area related to cognitive reappraisal and emotional regulation. This brain inactivity may explain why tinnitus becomes so difficult for these people to control: they lack the cognitive energy to mentally reposition the sound in a neutral or secondary place.

Obsessive-compulsive disorder (OCD) and auditory rumination: tinnitus as an obsession

Although less studied than anxiety and depression, obsessive-compulsive disorder (OCD) also bears an important relationship with tinnitus — especially in patients who develop an intense fixation with sound.

These people have rigid thought patterns, intolerance of uncertainty, and a high need for control. When tinnitus appears, it becomes the new "obsessive object": the mind attaches itself to it, trying to analyze it, control it, measure its intensity, anticipate its worsening. With this, a constant monitoring process is installed, reinforced by compulsive behaviors such as constantly seeking absolute silence, avoiding sounds or seeking "magical" treatments..



This fixation makes the brain no longer able to "ignore" the sound – preventing habituation. Studies suggest that patients with tinnitus and obsessive-compulsive symptoms have greater functional impairment and lower responses to conventional treatments (Crossley et al., 2020).

- **Anxiety;**
- **Discouragement or sadness;**
- **Constant irritability;**
- **Despair in the face of sound;**
- **Feeling powerless or lack of control;**
- **Stress peaks;**
- **Anger, hostility, or even panic;**
- **Feeling of being threatened or with no way out;**
- **Impatience, repulsion and, in some cases, hatred towards the sounds or situations that provoke them.**

Interestingly, the severity of these conditions is not directly linked to the physical characteristics of a sound – such as its intensity or frequency. Research shows that the most relevant factor is the meaning that the sound assumes for the individual and the impact it has on their life.

> **Living with tinnitus is not just listening to a sound. It is carrying a continuous noise that compromises the silence necessary to think, sleep, and exist calmly. Science has shown that this overload is not just subjective: it leaves objective traces in the functioning of attention, memory, and sleep quality..**

This bulletin will continue with the topic in the next volume (volume 2). Follow us for access to educational materials.

Quiz: Buzzing and Psychological Aspects - module 1

1. What is the main distinction between 'tinnitus' and 'tinnitus disorder', according to the text?

a) Tinnitus is temporary, whereas tinnitus disorder is always chronic.

b) Tinnitus is of psychological origin, and tinnitus disorder is auditory in origin.

c) Tinnitus is a perceived sound, whereas tinnitus disorder is tinnitus accompanied by intense distress, mood swings, or autonomic dysfunction.

d) innitus refers only to the subjective type, whereas tinnitus disorder includes the objective type as well.

e) Tinnitus is a symptom, and tinnitus disorder is a disease in itself.

2. According to the text, what is the main characteristic that distinguishes subjective tinnitus from objective tinnitus?

a) Objective tinnitus is the most common type and subjective tinnitus is the rarest.

b) Objective tinnitus is perceived only by the health professional, while subjective tinnitus is perceived by both the patient and the professional.

c) Objective tinnitus is often pulsatile and linked to vascular changes, while subjective tinnitus has no perceptible external source and is the most common type.

d) Only subjective tinnitus can be chronic.

e) Only subjective tinnitus has the potential to be eliminated with surgical treatment.

3. According to the text, tinnitus is a biopsychosocial phenomenon. Which of the following pieces of evidence supports this claim?

a) The intensity of tinnitus is directly proportional to hearing loss, without any influence of emotional factors.

b) The perception of tinnitus is a complex brain experience, influenced by extrasensory areas such as the limbic system, which processes emotions.

c) Research in functional neuroimaging shows that only the auditory areas of the brain are active in the perception of tinnitus.

d) The severity of tinnitus is solely linked to the physical characteristics of the sound, such as its intensity and frequency.

e) Tinnitus is a symptom, so there is no correlation with the brain.

4. Personality traits such as neuroticism, tendency to rumination, and body hypervigilance are associated with a more intense experience of tinnitus because:

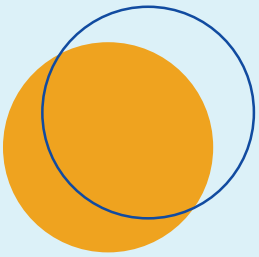
a) They promote the habituation of the brain to sound, making it easier to live with tinnitus.

b) The hyperactivity of the warning system and the obsessive monitoring of the sound make tinnitus more intense and invasive for the individual.

c) These traits weaken peripheral hearing, causing tinnitus.

d) Individuals with these traits are more likely to have objective tinnitus.

e) They have no relation to the experience of tinnitus, only to the mood of the individual.



5. What is the bidirectional relationship between depression and tinnitus, as described in the text?

a) Tinnitus distress can trigger depressive symptoms, and pre-existing depression can increase the perception of tinnitus by changes in neurotransmitters and brain areas.

b) Only pre-existing depression can increase the perception of tinnitus, without tinnitus causing depression.

c) Tinnitus leads to depression only in patients with hyperacusis and misophonia.

d) Depression causes tinnitus to become objective, making it audible to other people.

e) Depression and tinnitus are completely independent conditions and do not influence each other.

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Correct quiz answers:

1. correct answer: *c*
2. correct answer: *d*
3. correct answer: *c*
4. correct answer: *c*
5. correct answer: *b*

Author

DR. LISIANE HOLDEFER

- Speech Therapist and Psychologist
- Formação na Tinnitus Retraining Therapy
- Specialist in Audiology and Acupuncture
- Postgraduate in Cognitive-Behavioral Therapy and Integrative Mental Health
- Master and PhD in Medical Sciences from the University of Brasília

PROF. DR. PIOTR HENRYK SKARZYNSKI

- Professor, Otorhinolaryngologist, Master and Doctor from the Medical University of Warsaw;
- Realiza trabalho científico, didático, clínico e organizacional no World Hearing Center of Institute of Physiology and Pathology of Hearing, Institute of Sensory Organs and Medical University of Warsaw.
- Specialist in otorhinolaryngology, pediatric otorhinolaryngology, speech therapy and public health;
- Participated in the 3rd Consultation Meeting at the World Health Organization (WHO) World Hearing Forum.
- Membro do Roster of Experts on Digital Health da OMS;
- Vice-President and Institutional Representative of ISfTeH;- President-elect of the International Advisory Board of the American Academy of Otolology – Head and Neck Surgery (AAO-HNS);
- Membro do Departamento de Congressos e Reuniões da European Academy of Otology and Neuro-otology (EAONO), Representante Regional da Europa da International Society of Audiology (ISA), Vice-Presidente do Hearing Group, Auditor da European Federation of Audiology Societies (EFAS), membro do Facial Nerve Stimulation Steering Committee;
- Secretary of the Council of the Polish Society of Otorhinolaryngologists, Phoniatricians and Audiologists. Member of the Audit Committee (2018–2019)
- Goodwill Ambassador representing Poland at the AAO-HNSF 2021 OTO Annual Meeting and Experience and, since 2021, a member of the AAO-HNS Implantable Hearing Devices Committee and the Otology and Neurotology Education Committee.
- Advisory Committee of International Experts of the CPAM-VBMS, honorary member of the ENT Danube Society and honorary member of the Société Française d'OtoRhino-Laryngologie.
- Member of the Council of the National Science Center.

PROF. DR. MILAINE DOMINICI SANFINS

- Adjunct Professor of the Discipline of Hearing Disorders of the Speech-Language Pathology and Audiology Course at the Federal University of São Paulo (UNIFESP);

- Membro do grupo de pesquisa do Institute of Physiology and Pathology of Hearing and World Hearing Center, Kajetany, Poland.
- Professor of the Postgraduate Course in Clinical Audiology at the Israeli Institute of Teaching and Research of the Albert Einstein Hospital.
- Postdoctoral fellow at the World Hearing Center, Warsaw, Poland;
- Sandwich doctorate from the Faculty of Medical Sciences, State University of Campinas (FCM-UNICAMP) and from the Università degli Studi di Ferrara/Italy;
- Specialist in Audiology by the Federal Council of Speech-Language Pathology and Audiology;
- Bachelor's and Master's degree from the Faculty of Medicine of the University of São Paulo (FMUSP);
- Member of the teaching and research committee of the Brazilian Academy of Audiology (2024-2026);
- Rapporteur of the Research Ethics Committee of the Federal University of São Paulo;
- Reviewer of scientific articles and book chapters in the area of Audiology, Electrophysiology, Neuroaudiology and Neuroscience;
- Instagram @misanfins / email: msanfins@uol.com.br e msanfins@unifesp.br