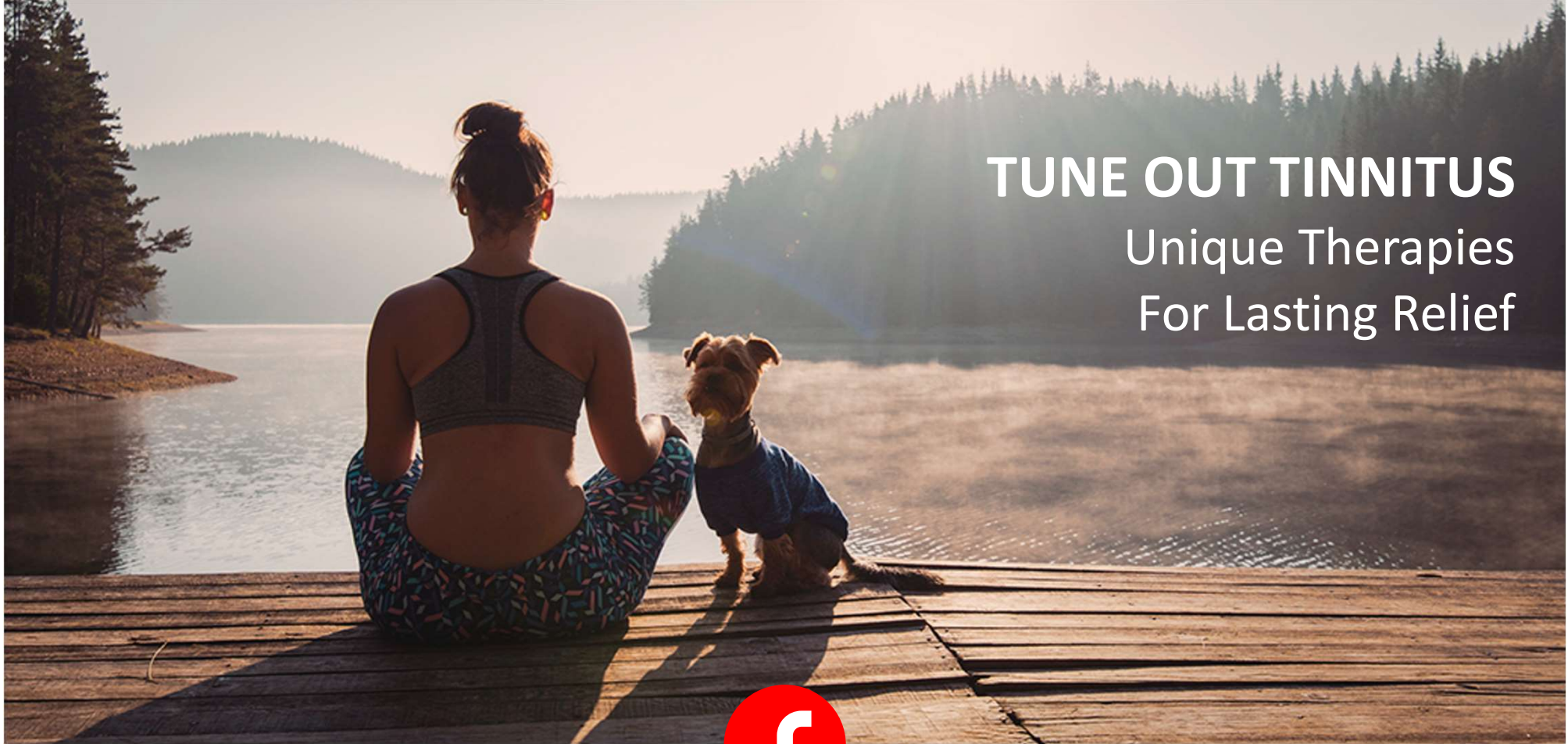




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# Hearing Healthcare Providers 2023 Conference



# TUNE OUT TINNITUS

Unique Therapies  
For Lasting Relief



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Clinical Education Specialist  
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**Disclosure:** I have the following relevant financial relationship in the products or services described, reviewed, evaluated or compared in this presentation.

I am a Clinical Education Specialist with the Education and Training team for Signia, for which I receive a salary. I have no relevant nonfinancial relationship(s) to disclose.



# Today's agenda

1. Definition, epidemiology, and mechanisms of tinnitus
2. Treatment protocols
3. Tinnitus therapy options



# Definition



- “The perception of sound when no actual external noise is present”
- <https://www.ata.org/understanding-facts>



# Epidemiology

**Tinnitus Practitioners Association (TPA)** - an organization that promotes best practices in the care of those with tinnitus and sound sensitivity.

- Tinnitus affects 10-17% of the general population
- 30% of people over the age of 65 report tinnitus
- 5% of the general population with tinnitus seek care
- ~2.6 million feel their tinnitus is a debilitating problem



# Types of tinnitus

There are two types of tinnitus:

## **Somatosound / Objective**

- Tinnitus is audible to someone else besides the patient
- Generally, originates from middle ear or vascular system

## **Neurophysiological / Subjective**

- Tinnitus is audible only to the patient
- High-frequency hearing loss is the highest predictive risk factor for tinnitus
- Strong evidence suggests that acoustic or sound therapy can help mitigate the effects of subjective tinnitus



# Neurophysiological Tinnitus

## Psychoacoustic Characteristics

- Frequency
- Intensity
- Location (ears, head)
- Duration (continuous, intermittent, fluctuating)
- Description (tonal, whistle, crickets, ocean waves, siren, pressure cooker)
- Single or multiple sounds





# Tinnitus Categories

A joint comprehensive tinnitus study conducted by the Kresge Hearing Research Laboratory and the University of Oregon Health Sciences Center Tinnitus Clinic revealed:

**Tinnitus pitch falls largely into two broad categories: tonal and noise**

59% reported tonal tinnitus

25% reported noise-type tinnitus

16% presented with a combination

**For tonal tinnitus, it is often reported to be a higher pitch or frequency**

63% indicated perceiving tinnitus between 2000 and 7000 Hz

21% had low-tone tinnitus below 2000 Hz

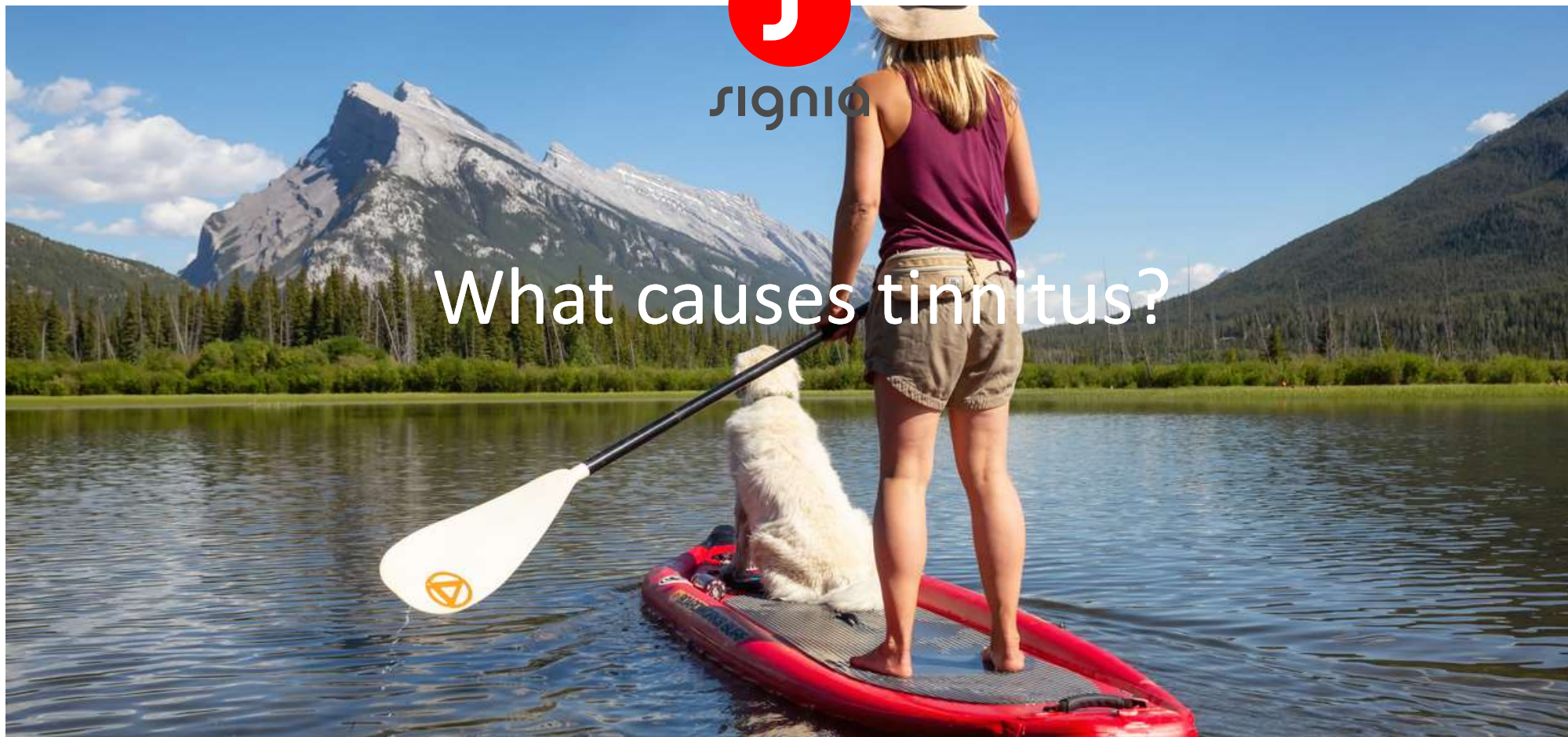
16% above 7000 Hz





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What causes tinnitus?



# Causes of tinnitus

Over 200 causes described

Changes at any point of the auditory pathway

- Otitis
- Otosclerosis
- Acoustic neuroma
- Meniere's disease
- Acoustic trauma
- Noise exposure
- Ototoxicity
- Presbycusis



Changes from outside the ear, but affect its functioning

- Metabolic
- Cardiovascular
- Neurological
- Pharmacological
- TMJ Disorder
- Psychological
- Dietary



# Mechanisms of Tinnitus

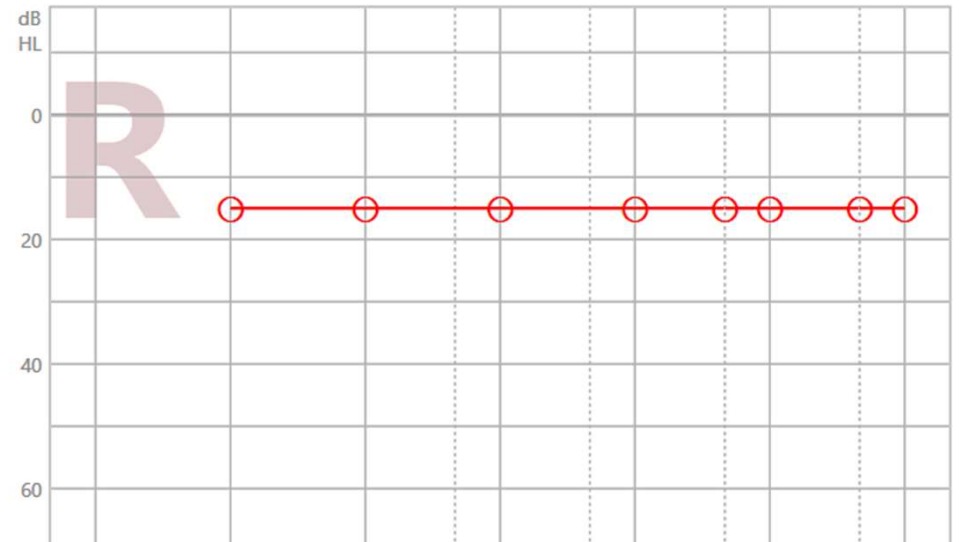
## Peripheral vs. Central Mechanisms

### Does a normal audiogram mean normal auditory function?

- Cochlear Synaptopathy: A type of damage to the synaptic junction between cochlear hair cells and the auditory nerve that may explain the result of tinnitus with normal hearing thresholds

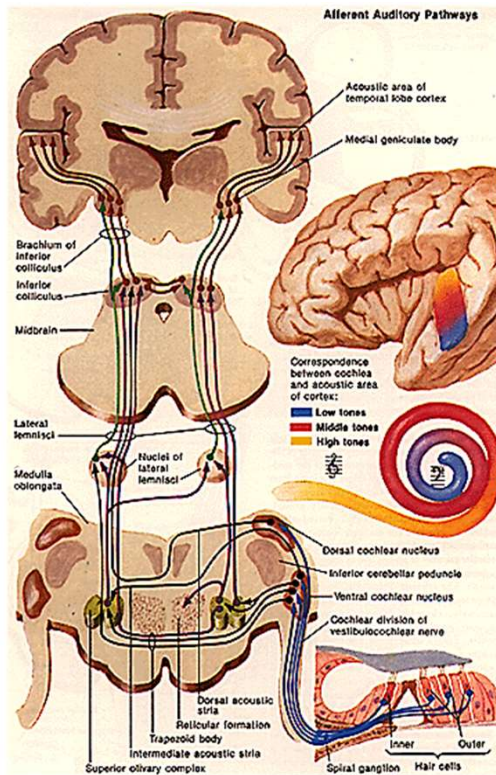
### Why do some people with hearing loss have tinnitus and others do not?

- The non-auditory portions of the brain can inhibit or filter out repetitive sound, deemed unnecessary, so that person may not perceive tinnitus
- Another person can have the same loss, but the central portions do not 'turn it off', so that person perceives or "hears" the tinnitus



# Mechanisms of tinnitus

## Central Nervous System changes



- Exposure to noise and other agents that induce tinnitus cause changes in the central auditory pathway secondary to peripheral damage.
- The mechanisms for tinnitus go beyond the inner ear and auditory nerve and affect various areas of the central auditory pathway, up to and including the Auditory cortex
- Functional MRI testing supports this by showing areas of the auditory cortex and other areas along the pathway “lighting up” in patients with tinnitus versus no additional activity in patients without tinnitus. Changes in the blood supply based on auditory reaction to sound can be seen.



# Neurophysiological model of tinnitus

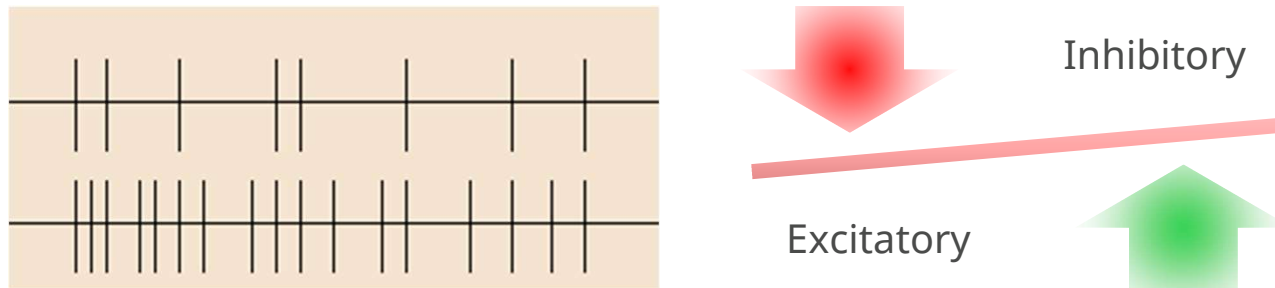
Central Nervous System changes

Damaged hair cells leads to

Reduction in the inhibitory capacity of the neurons that are deprived of input

Neural hyperactivity (increased spontaneous activity)

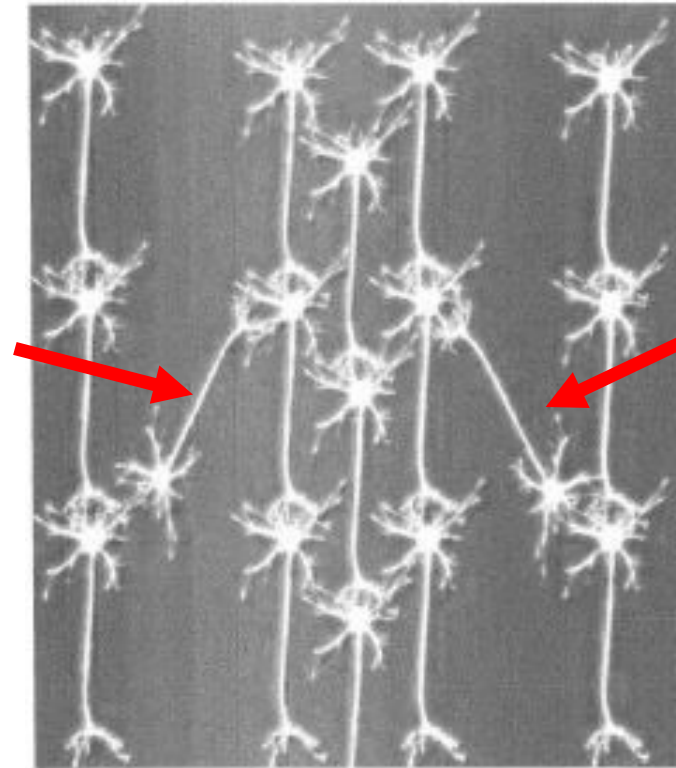
Sometimes this leads to increased neural synchrony which leads to the “ringing”



# Plasticity of The Human Auditory Cortex

## What is lateral inhibition?

- The capacity of an excited neuron to reduce the activity of its neighbors
- **Lateral inhibition** disables the spreading of action potentials from excited neurons to neighboring neurons in the **lateral** direction



Lateral inhibitory connections from neighboring neurons



## Impact of tinnitus

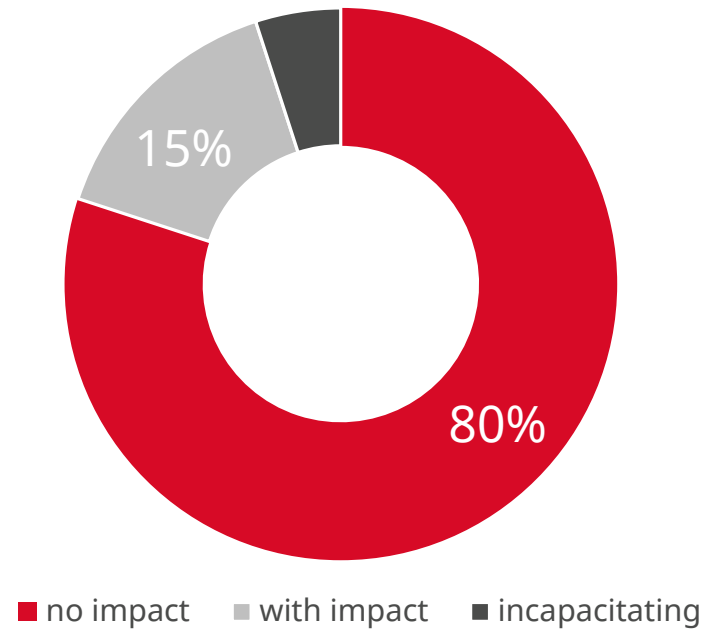


Why do individuals have different reactions to tinnitus?



## Impact on daily life

Only 20% of the tinnitus population find it to be a significant problem, yet for this group, tinnitus can be highly debilitating



# Neurophysiological model of tinnitus

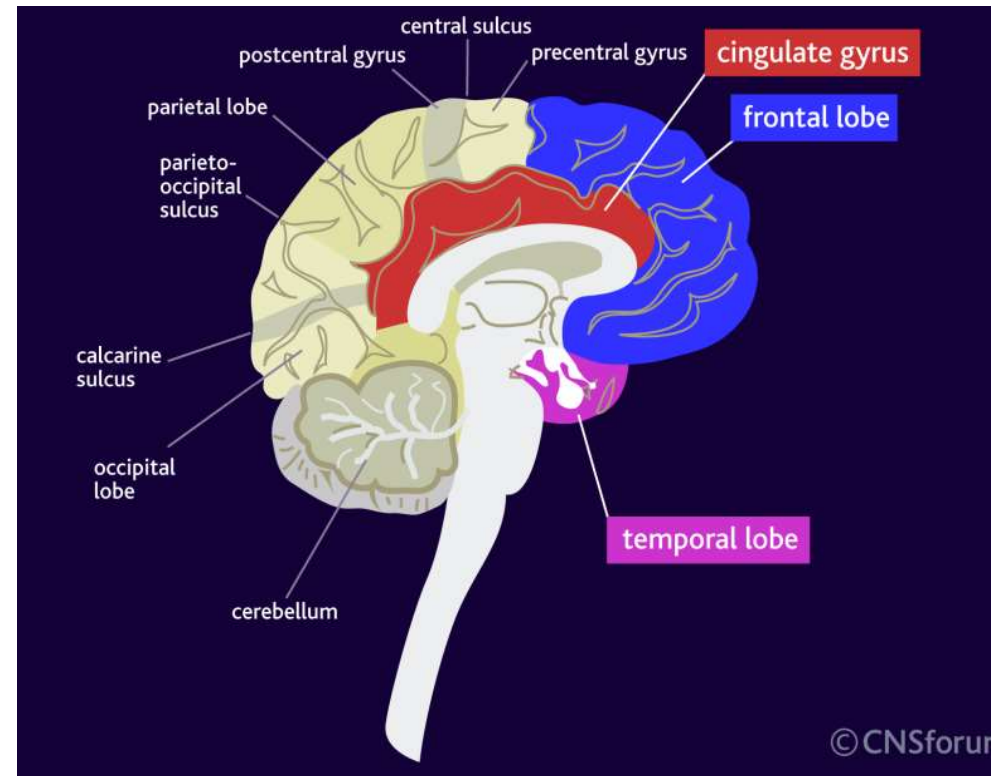
Dr. Jastreboff

## Auditory pathways and the limbic system

Different areas of the brain have different roles

The limbic system is responsible for motivation, mood and emotion

Tinnitus-related complaints such as insomnia, anxiety, depression, fear are indicative of the association of the limbic system

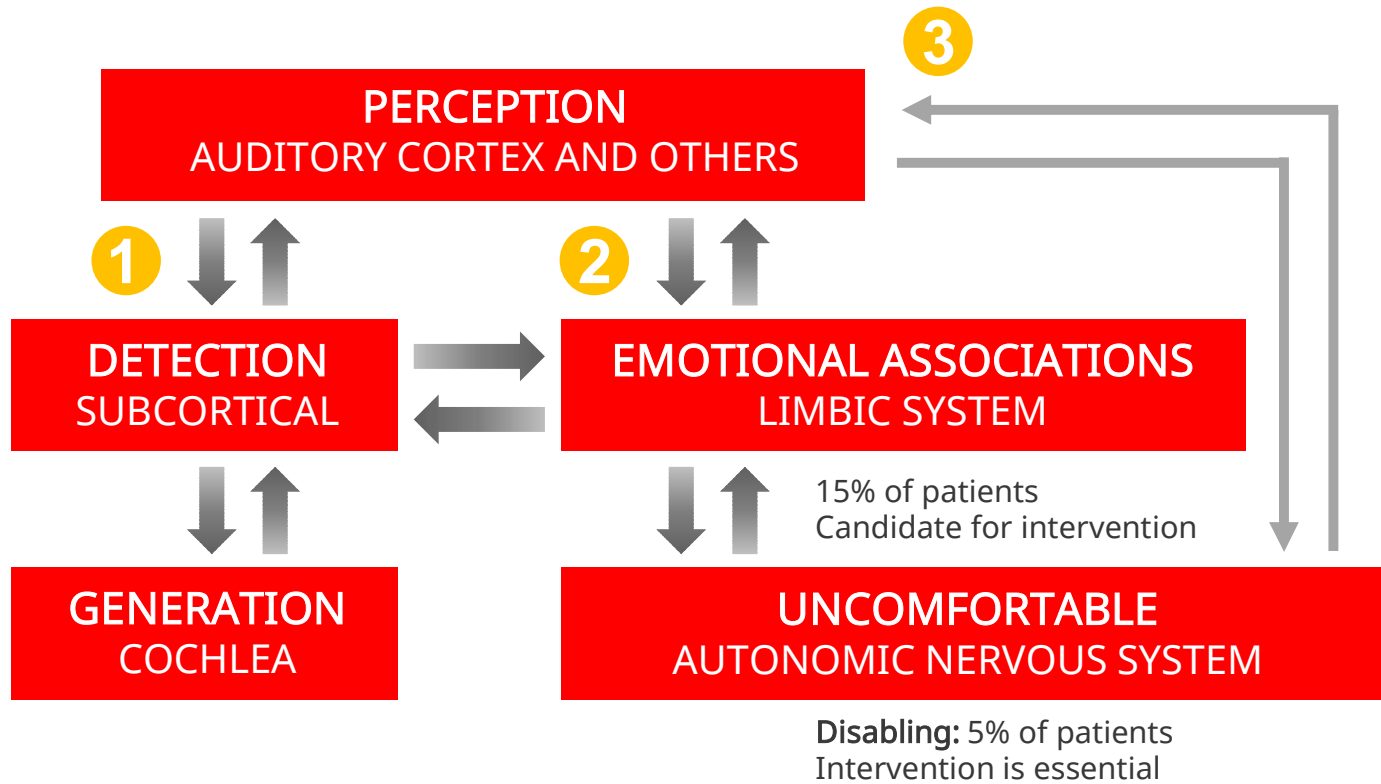


Dalgleish, 2004; Jastreboff, 1990



# Neurophysiological model of tinnitus

Dr. Jastreboff



## Possible repercussions

- Significant tinnitus may impair quality of life
- Sleep disturbance
- Difficulty concentrating
- Emotional imbalance
- Decreased socialization

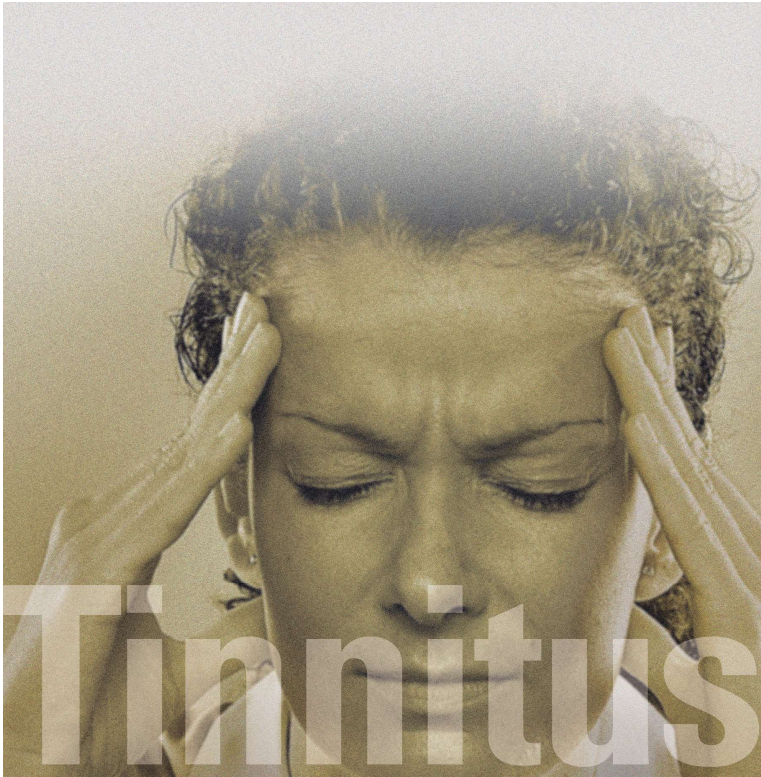


# Today's agenda

1. Definition, epidemiology, and mechanisms of tinnitus
- 2. Treatment protocols**
3. Tinnitus therapy options



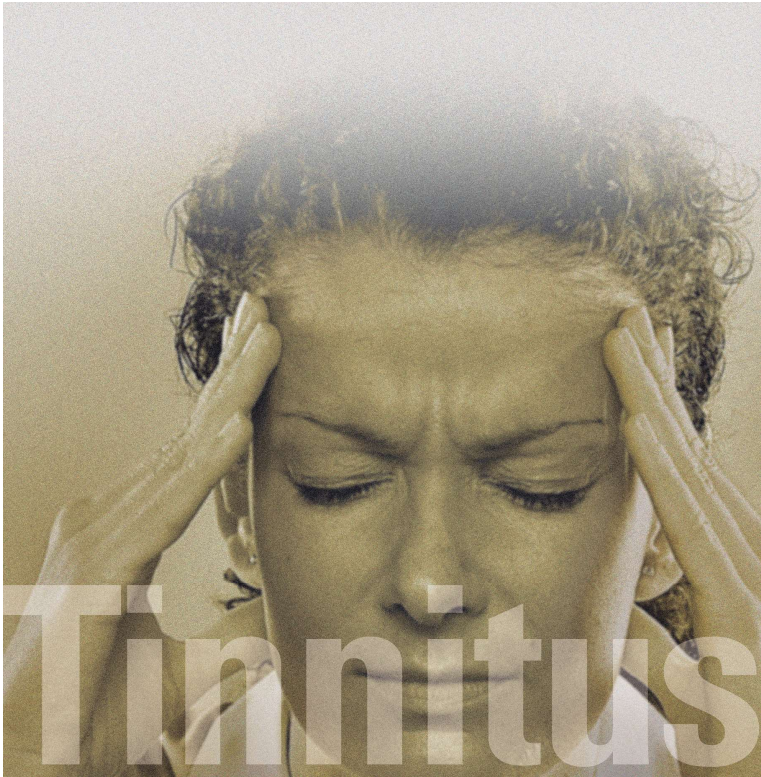
# Acoustic Treatment Protocols



- Amplification alone-sound therapy
- Tinnitus Activities Treatment - TAT is an intervention using individualized counseling (considers thoughts and emotions, hearing and communication, sleep, and concentration)  
*Richard Tyler Ph.D.- University of Iowa*
- Tinnitus Retraining Therapy - TRT is a process of learning to cope with your tinnitus on a conscious and subconscious level; courses throughout year  
*Pawel J. Jastreboff, Ph.D., Sc.D., M.B.A.- Emory University*
- Progressive Tinnitus Management - PTM a program adopted both by VA and dept of defense clinics to treat tinnitus. Uses 5 different levels of treatment; as the levels progress, the therapy gets more intensive and long-term; it can use a combination of sound generators, masking, cognitive behavioral therapy, relaxation techniques; the level depends on the need of the patient  
*James A. Henry, Ph.D.- National Center for Rehabilitative Auditory Research (NCRAR)*



# Acoustic Treatment Protocols



- Cognitive Habituation Tinnitus Treatment – CHaTT a combined approach of using cognitive behavioral therapy, habituation, and sound therapy; similar to PTM  
*Natan Bauman Ed.D, M.S. Eng., New England Tinnitus and Hyperacusis Clinic*
- Tailor –Made Notched Music Training – TMNMT using music and notching it centered around the tinnitus  
*Hidehiko Okamoto, Ph.D. National Institute for Physiological Sciences, Japan*
- Notch Therapy – NT  
*KeyNumerics Medical Engineering & Signia*



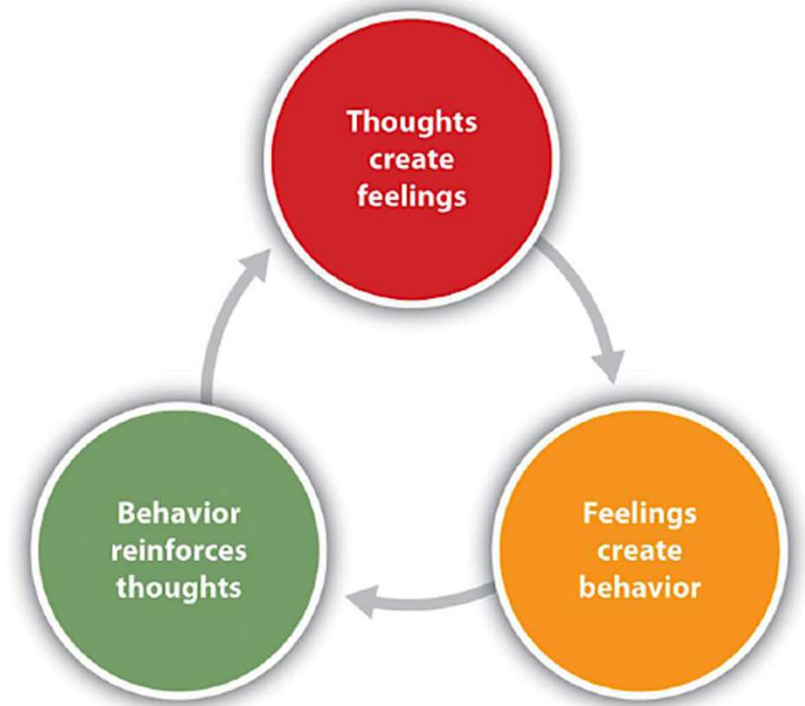
# Tinnitus treatment protocols

Many approaches, but they often have a great deal in common:

- Counseling of some type
- Sound therapy of some type
- No approach treats tinnitus, but rather the *reaction* to tinnitus
- Some potential differences are the areas emphasized in counseling, perspectives of directive vs. collaborative interaction with patient

## Cognitive-behavioral therapy(CBT) and tinnitus

- CBT is Psychotherapy
- Consists of face-to-face sessions; 6-18 sessions, hourly, over many weeks
- Performed by a licensed therapist/psychologist in CBT
- HCP may suggest CBT or make a referral





# Psychology And Tinnitus Counseling



Spankovich, Signia Tinnitus Workshop, Chicago (2019)

Literature suggests relationship between depression, anxiety, and tinnitus

Gomaa, et al., 2014

Know your limitations

Physiology and psychology are not independent

Go over the Game Plan!

- Be supportive and positive
- Be knowledgeable
- Be clear
- Be hopeful
- Be empathetic





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And now... what  
should we do?



# Today's agenda

1. Definition, epidemiology, and mechanisms of tinnitus
2. Treatment protocols
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# Tune out tinnitus

Unique therapies for lasting relief



# Treatments for tinnitus

Amplification



Static signal



Modulated



Notch therapy



# Benefits of amplification for tinnitus

Amplification is #1 treatment for tinnitus

Amplification





# Benefits of amplification for tinnitus

“The sounds amplified by the hearing aids produce neural activity by the auditory system, which interferes with the representation of tinnitus in the central auditory system”

Amplification helps to reduce the contrast between the tinnitus and the background by enriching the sound environment

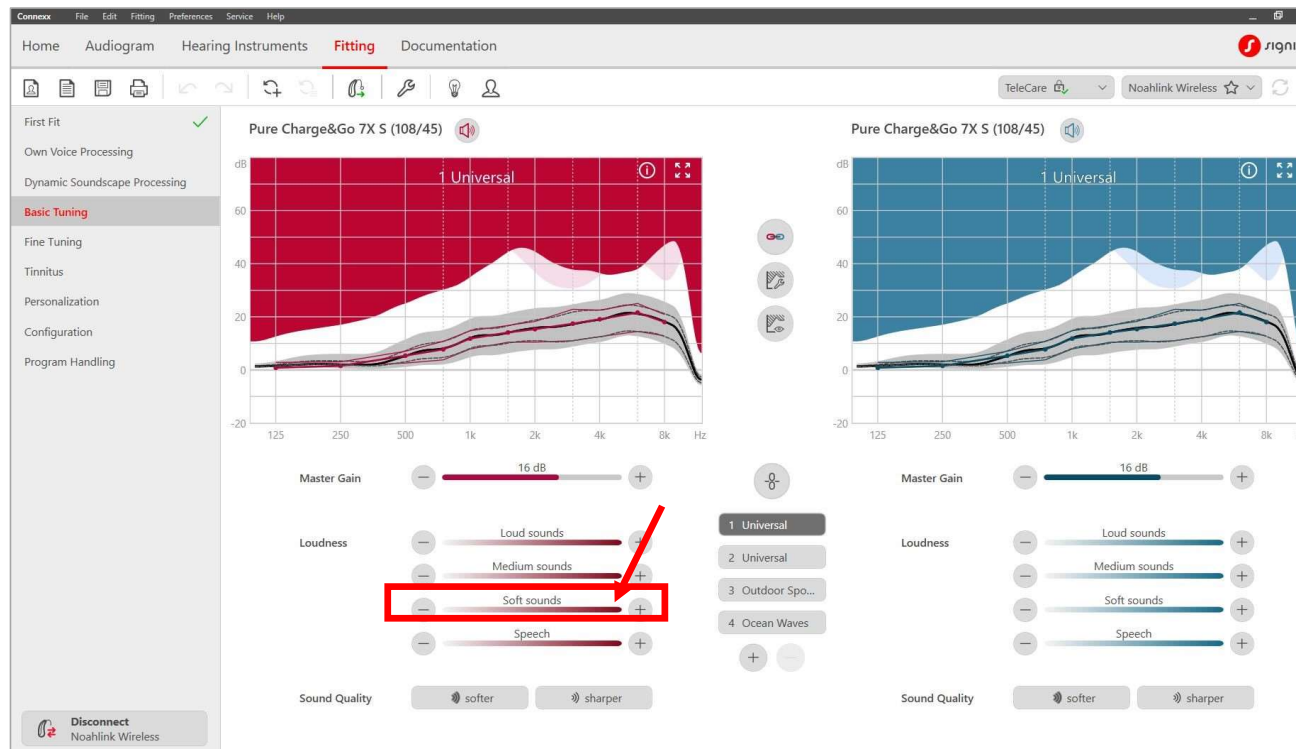
The most effective hearing aid settings for communication are not necessarily the best for reducing tinnitus audibility





# Amplification only Adjustments to consider

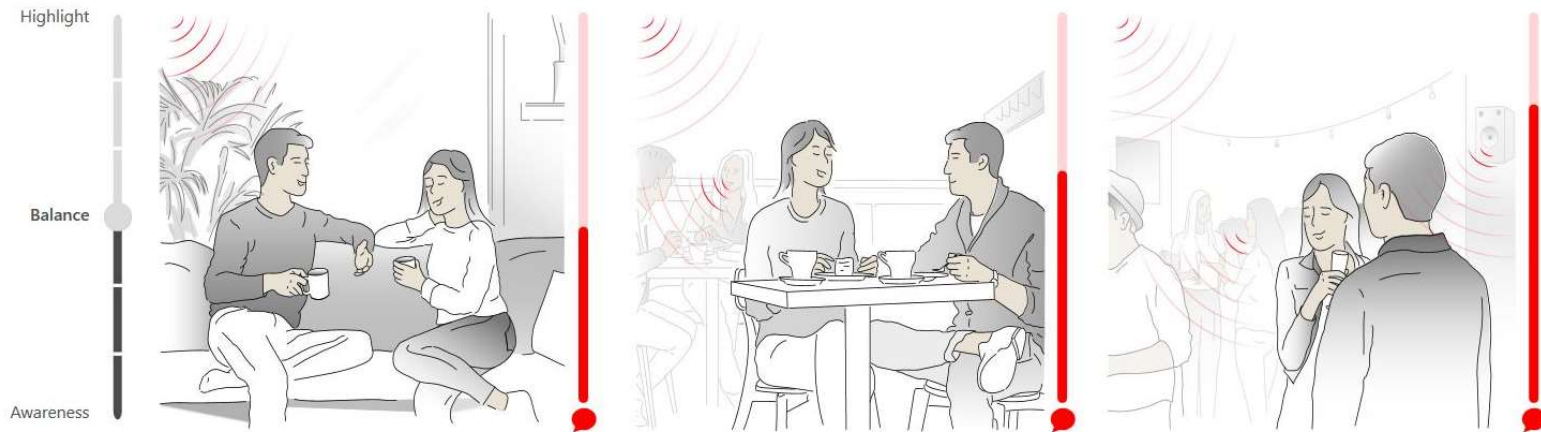
Advanced feature options within software:



# Amplification only

## Dynamic Soundscape Processing 2.0

Increase awareness



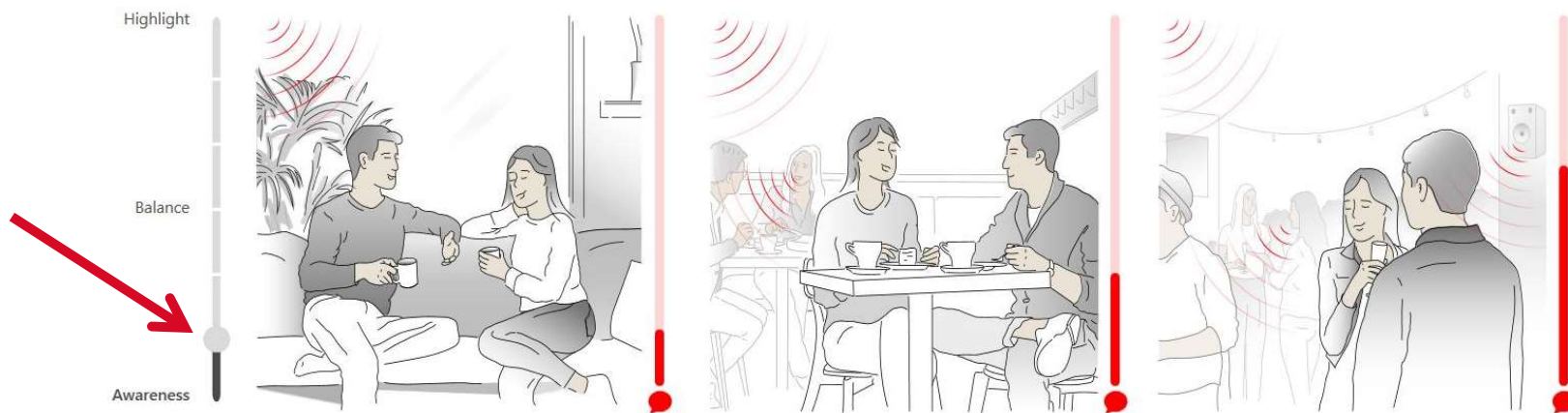
Speech support [More information](#)



# Amplification only

## Dynamic Soundscape Processing 2.0

Increase awareness



Speech support [More information](#)



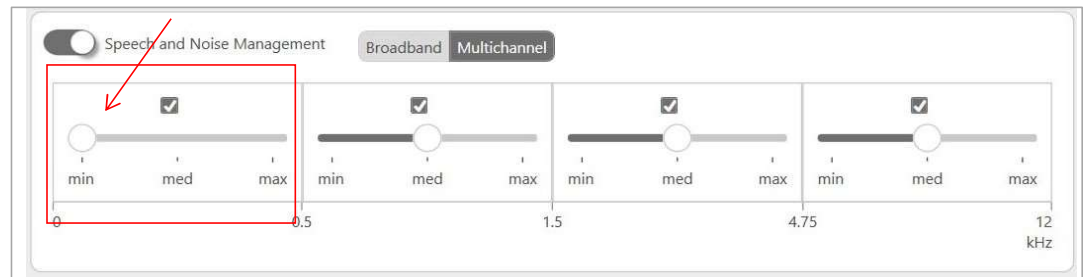
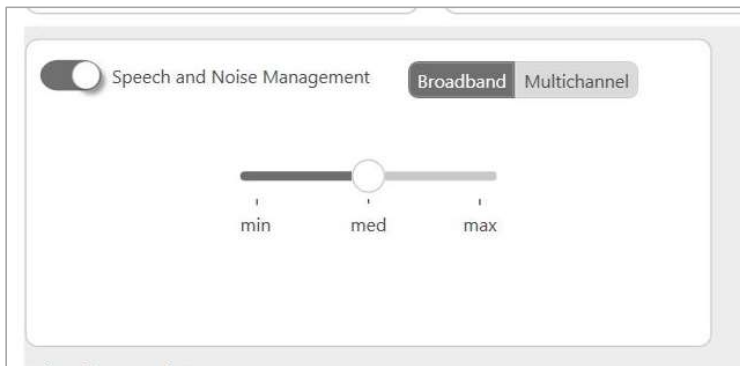
# Amplification only

## Adjustments to consider



Advanced feature options within software: Sound Settings

- Using environmental noise as a natural masker by reducing the level of noise reduction
- Use a multichannel approach to noise reduction in which less noise reduction can be applied in the lower frequencies where “room noise” is typically present



# Amplification only

## Adjustments to consider



### Advanced feature options within software: Microphone/Audio

- Choose a fixed omnidirectional microphone mode when tinnitus is more intense by adding an additional program



# Amplification only

## Augmented Xperience

Program Handling

Add Outdoor Sports - rename



# Tinnitus Worsened By Wearing Hearing Instruments

## Recommendations

- If amplified sound exacerbates tinnitus - turn down the gain, reduce MPO's
- If the ear mold or type of instrument used is excluding external masking sounds - change to an open fit
- If tactile sensation around the ear is the cause – try alternative instrument styles and ear mold strategies  
~Richard Tyler, 2013
- Try notch therapy – it is possible that removal of the stimulus in the pitch matched area may lesson this reaction



# Habituation Therapy

What if amplification is not enough?



Static signals:  
Soft and gentle sounds that take away the annoyance of tinnitus



Modulated Options:  
What could be more relaxing than the sound Ocean Waves?

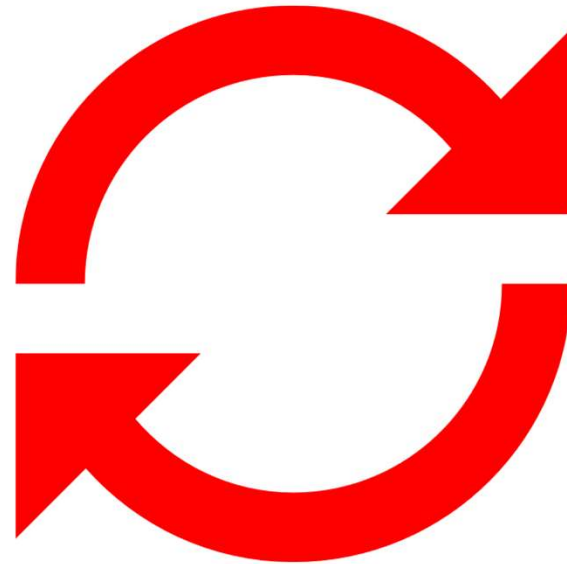


# Habituation

"It is the reduction or elimination of CNS activity in response to repetitive stimuli"

(Encyclopedia of Neuroscience, 1987)

It is a natural process of the CNS and crucial to brain function due to its limitations when performing many tasks simultaneously



# Therapy signal options

## Static Signals



**Pink Noise** - each octave carries an equal amount of energy



**White Noise** - constant spectral density across all frequencies



**Speech Noise** - corresponds to the frequency shaping of the Long-Term Average Speech Spectrum (LTASS)



**High Tone** - more intensity in the high frequency region



**Brownian Noise** - the power density decreases with increasing frequency



# Therapy Signal Options

## Static Signals



Sound Therapy

Signal **White Noise**  Mix with microphone

Handles **1** 2 5 10

White Noise 37

Pink Noise

Speech Noise

High Tone Noise

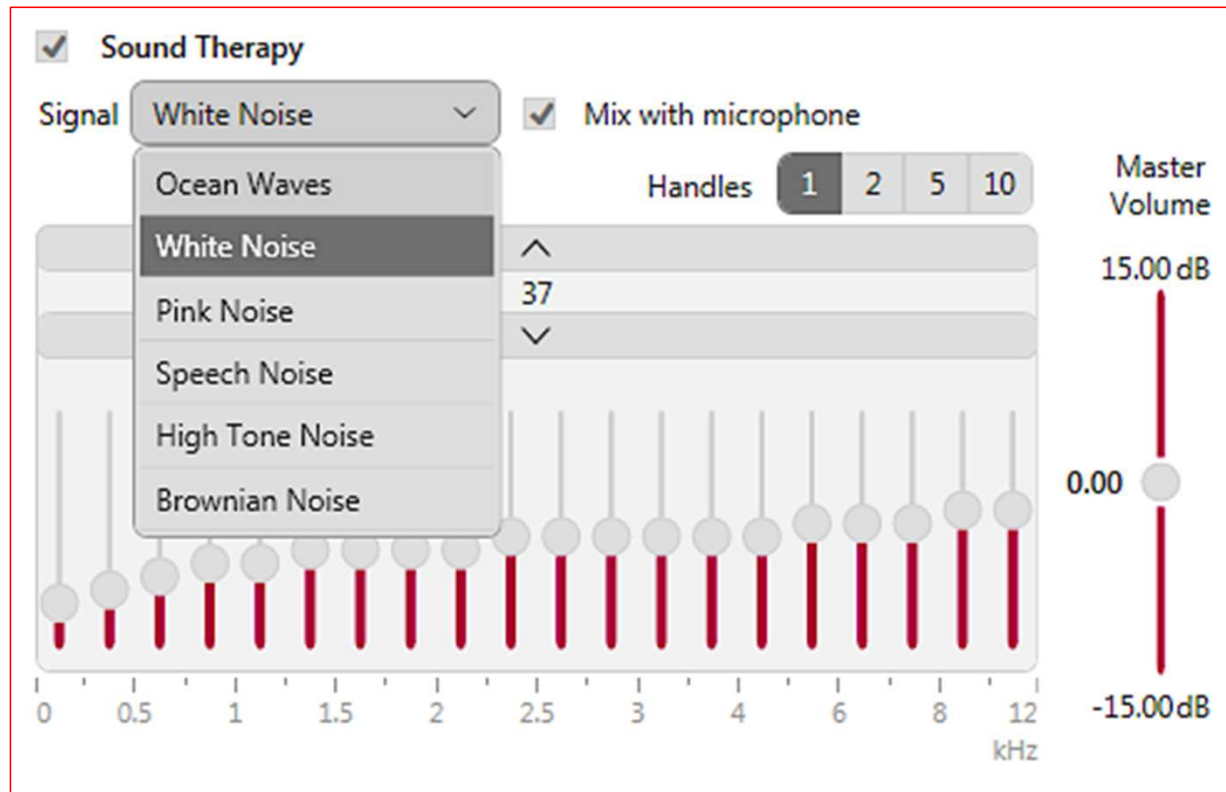
Brownian Noise

Master Volume 15.00 dB

0.00

-15.00dB

0 0.5 1 1.5 2 2.5 3 4 6 8 12 kHz



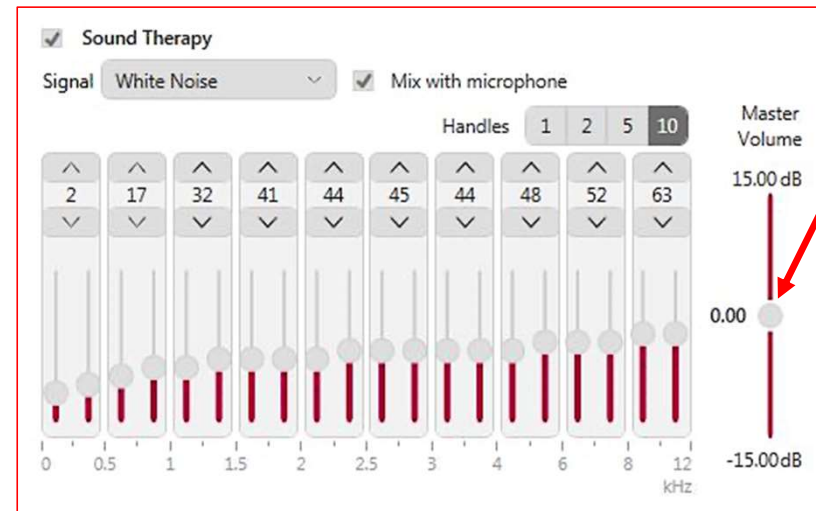
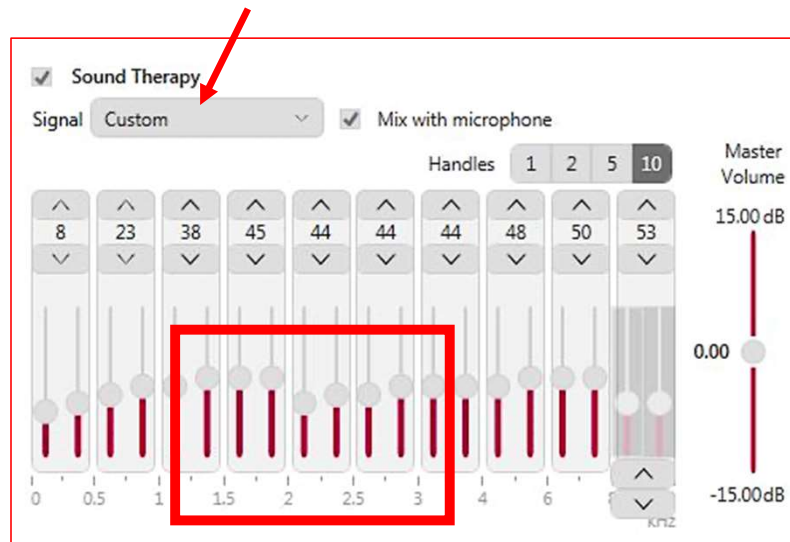
# Therapy Signal Options

## Static Signals



Determine the type of therapy signal

1. Individual sliders or handles to customize the frequency response
2. Master Gain control to maintain the noise's spectral characteristics



# Modulated sound options



Ocean wave therapy signals mimic the sound of the sea  
A Positive, Soothing and Stress Relieving listening experience

Rocky Beach, Paradise Beach, Boulder Beach, Pebble Beach



# Apps and Tinnitus

There is an app for that!

Sound options are expanding with environmental sounds and/or use of smartphone

- Manufacturer-based apps
- SimplyNoise app, SimplyRain (free), Relax Melodies, Calm
- Low-Cost
- Customize sound (sound is subjective)
- Downside: Can affect battery drain

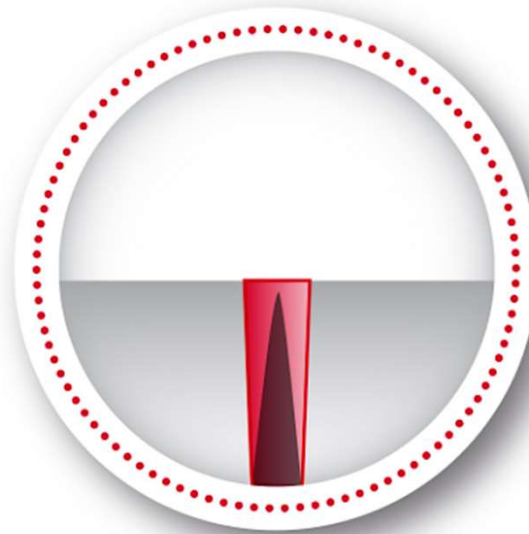


# Treatments for tinnitus

## Notch Therapy

Relief without adding a masking sound

Unique to Signia: Tuning out tinnitus for a truly peaceful experience



■ Tinnitus frequency    ■ Amplified background sounds    ■ Tinnitus therapy



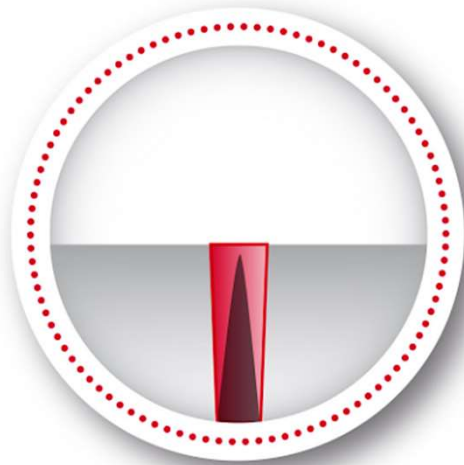
# Treatments For Tinnitus

## Notch Therapy



Notch therapy is designed to induce neural plasticity-based changes in the auditory system (auditory cortex) with the purpose of reducing the perceived loudness of tinnitus.

The goal is to lessen neural hyperactivity by strengthening the weakened inhibitory networks in the frequency band for an individual's tinnitus.





# Psychoacoustic Measure of Tinnitus

## Pitch Matching

- Stimulus: pure tone or narrowband noise
- 125 to 12000 Hz
- Test one ear at a time
- Start at 1000 Hz and go up in frequency
- Present tones at 5-10 dB above the hearing threshold until closest match is found
- Always determine the hearing threshold at the tinnitus pitch



[http://www.tinnitusresearch.org/en/documents/downloads/TRI\\_Tinnitus\\_Flowchart.pdf](http://www.tinnitusresearch.org/en/documents/downloads/TRI_Tinnitus_Flowchart.pdf).



# Psychoacoustic Measure of Tinnitus

## Loudness Matching

The initial intensity (i.e. starting point) of the stimulus should be below the hearing threshold level, at the frequency matched during Pitch Matching

- Increase the stimulus in 1 dB steps until it is equal in loudness to the loudness of the tinnitus
- Test one ear at a time
- Tinnitus Loudness SL = dB HL (match) – dB HL (hearing threshold)

Tinnitus 4KHz 70dB

Threshold -4KHz 60dB

---

10 dB SL

[http://www.tinnitusresearch.org/en/documents/downloads/TRI\\_Tinnitus\\_Flowchart.pdf](http://www.tinnitusresearch.org/en/documents/downloads/TRI_Tinnitus_Flowchart.pdf)



# Signia Notch Therapy



A filtered notch (0.5 octave), centered at the pitch of the tinnitus, is provided through the hearing aids

By notching the amplification we attack tinnitus on two fronts:

- Enhancing the auditory environment to compensate for the hearing loss
- Suppressing the tinnitus associated neural hyperactivity by stimulating lateral inhibition

The brain is trained to provide more inhibition to the area of the notched amplification

**The result is a decrease in the perception of tinnitus loudness**



# Signia Notch Therapy



Notch therapy showed clear improvement in as few as three weeks and maintained the benefit past six months\*.

\*Powers, L., dos Santos, G.M., & Jons, C. (2016, September). Notch Therapy: A new approach to tinnitus treatment. AudiologyOnline, Article 18365



# Signia Notch Therapy

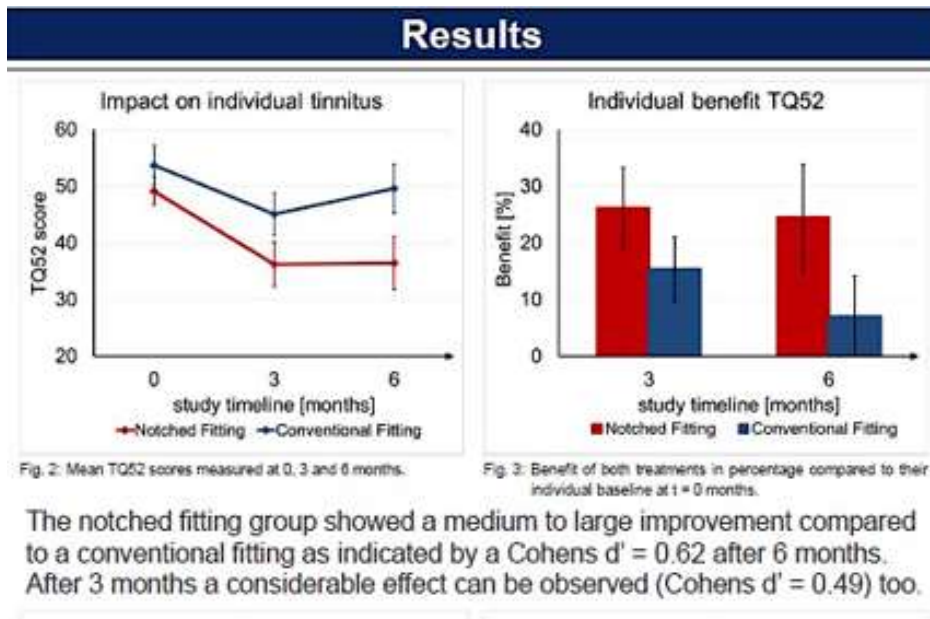
## 6-month Evaluation

### Six-month evaluation of notched environmental sound therapy

- 34 patients
- Mean age: 56
- Subjective chronic tonal tinnitus
- Mild to moderate hearing loss
- Group 1: commercially available BTE
- Group 2: same but with TF-matched spectral notch activated, 0.5 octave wide
- Subjective measure: TQ 52
- Objective measure: Neural long-term habituation correlates, expressed as I-hab gain factor



# Signia Notch Therapy Subjective Results



Commercially available behind-the-ear hearing aids were modified so that a frequency band of 0.5 octave, entered on the patient's tinnitus frequency, was blocked out.



# Tailor-made Notch Music Study



PNAS

## Listening to tailor-made notched music reduces tinnitus loudness and tinnitus-related auditory cortex activity

Hidehiko Okamoto<sup>a,1</sup>, Henning Stracke<sup>a,1</sup>, Wolfgang Stoll<sup>b,2</sup>, and Christo Pantev<sup>a,3</sup>

<sup>a</sup>Institute for Biomagnetism and Biosignalanalysis, Westfalian Wilhelms-University, Malmedyweg 15, Muenster, Germany; and <sup>b</sup>Department of Otorhinolaryngology, Head and Neck Surgery, Muenster University Hospital, Kardinal-von-Galen-Ring 10, 48149 Muenster, Germany

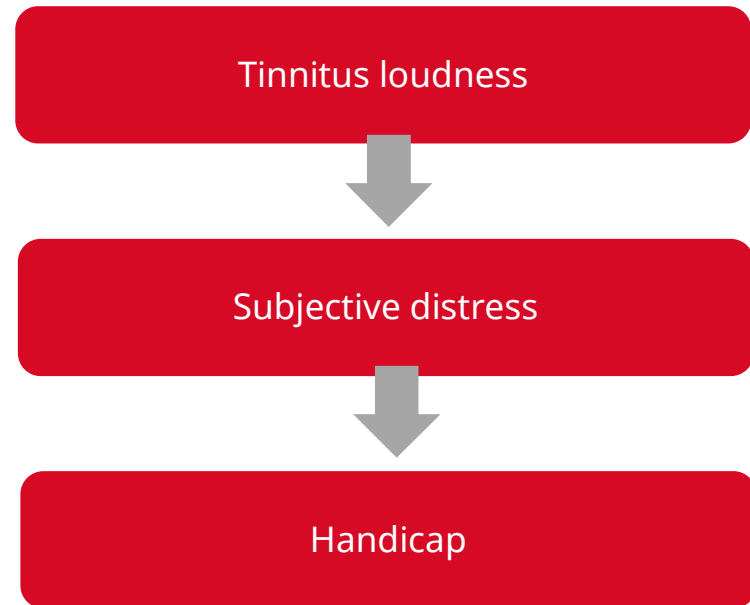
Edited by Michael M. Merzenich, University of California at San Francisco, San Francisco, CA, and approved December 3, 2009 (received for review September 30, 2009)



# Tailor-made notched music treatment

## Key points

- In the target group, tinnitus loudness was significantly reduced after 12 months of treatment compared to baseline.
- In contrast, for the placebo group significant differences from baseline were not found, indicating that a systematic change in tinnitus loudness was not present in these groups.





# Signia Notch Therapy



## Candidates for Notch Therapy

- Tonal Tinnitus: pure-tone, whistling, ringing or humming sound
- Any type and degree of hearing loss

## Tinnitus pitch assessment via Connexx 9 software

- Easy step-by-step process
- No additional tools required



# Signia Notch Therapy Pitch Matching



The screenshot displays the Signia Connexx software interface for Notch Therapy. The left sidebar shows a menu with 'Notch Therapy' circled in red. The main window shows a graph of dB HL vs Hz with a blue line and a red vertical line. Below the graph, there are instructions for 'Guided Matching' and 'Manual Matching', and a 'Frequency Check' section. A red box highlights the 'Step 1' instructions and the 'Select' buttons for Tone A and Tone B.

**Notch Therapy**

sDemo (Pure Charge&Go 7Nx M (119/60))  
Remaining trial period: 420h

sDemo (Pure Charge&Go 7Nx M (119/60))  
Remaining trial period: 420h

dB HL

0

20

40

60

80

100

120

125 250 500 1k 2k 4k 8k Hz

Test Side

**Guided Matching** Manual Matching Direct Entry

Selected tonal tinnitus frequency: \_\_\_\_\_

**Activate Notch**

1 Universal

Before starting, check that your patient experiences tonal tinnitus.

Press and hold the button to play tone A and B and select the one that is most similar to the tinnitus.

**Step 1**

Tone A (45 / 45 dB HL, 4000 Hz):

Tone B (45 / 45 dB HL, 5333 Hz):



# Signia Notch Therapy

## 3 Options For Pitch Matching



**Guided Matching** Manual Matching Direct Entry

Before starting, check that your patient experiences tonal tinnitus.

Press and hold the button to play tone A and B and select the one that is most similar to the tinnitus.

**Step 1**

Tone A (50 / 50 dB HL, 4000 Hz):

Tone B (51 / 51 dB HL, 5333 Hz):

Guided Matching **Manual Matching** Direct Entry

Please choose a tonal frequency:

1/3 octave  1/6 octave

Guided Matching Manual Matching **Direct Entry**

Please choose a tonal frequency:

4000 Hz



# Signia Notch Therapy Frequency Check



The screenshot shows the Signia Connexx software interface. The main window displays a hearing loss graph for 'sDemo (Pure Charge&Go 7Nx M (119/60))'. The graph plots dB HL (0 to 120) against frequency (125 to 8k Hz). A red vertical line indicates the 'Selected tonal tinnitus frequency: 4000 Hz'. Below the graph, the 'Frequency Check' dialog box is highlighted with a red border. It contains the following text:

**Frequency Check**  
 Which tone sounds most similar to your perceived tinnitus?

Tone A (45 / 45 dB HL, 2000 Hz): [Play] [Select]  
 Tone B (45 / 45 dB HL, 4000 Hz): [Play] [Select]  
 Tone C (45 / 45 dB HL, 8000 Hz): [Play] [Select]

Buttons: [Restart] [Volume]

**Selected tonal tinnitus frequency: 4000 Hz**

**Frequency Check**

Which tone sounds most similar to your perceived tinnitus?

Tone A (45 / 45 dB HL, 2000 Hz): [Play] [Select]  
 Tone B (50 / 50 dB HL, 4000 Hz): [Play] [Select]  
 Tone C (55 / 55 dB HL, 8000 Hz): [Play] [Select]

[Restart] [Volume]



# Signia Notch Therapy

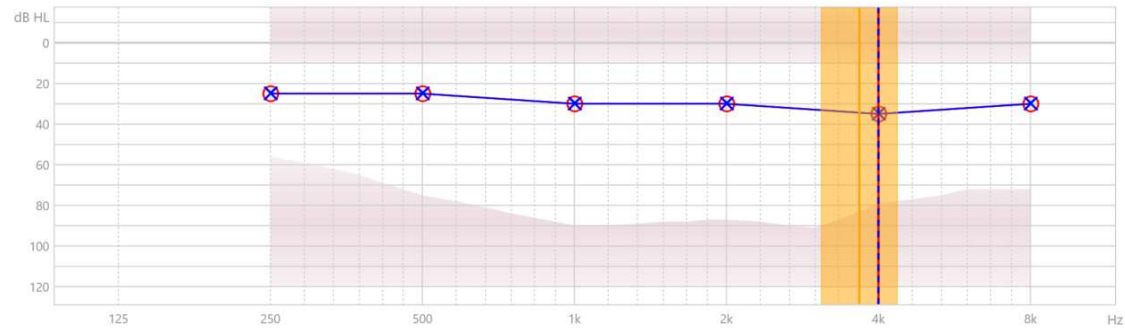
## Activate Notch



- First Fit ✓
- Own Voice Processing
- Dynamic Soundscape Processing 2.0
- Basic Tuning
- Fine Tuning
- Tinnitus**
- Sound Therapy
- Notch Therapy**
- Personalization
- Configuration
- Program Handling

**Disconnect**  
Noahlink Wireless

Pure C&G T 7AX S (110/46)



Pure C&G T 7AX S (110/46)

Guided Matching
Manual Matching
Direct Entry

Test Side ■ ■ ■

Selected tonal tinnitus frequency: **3667 Hz**



Before starting, check that your patient experiences tonal tinnitus.

Press and hold the button to play tone A and B and select the one that is most similar to the tinnitus.

**Step 1**

- Tone A (40 / 40 dB HL, 4000 Hz): ▶ Select
- Tone B (38 / 38 dB HL, 5333 Hz): ▶ Select

Restart ▶

**Frequency Check**

Which tone sounds most similar to your perceived tinnitus?

- Tone A (35 / 35 dB HL, 1833 Hz): ▶ Select
- Tone B (39 / 39 dB HL, 3667 Hz): ▶ Select
- Tone C (35 / 35 dB HL, 7333 Hz): ▶ Select

Restart ▶

**Activate Notch**

- 1 Universal
- 2 Noisy Environ...
- 3 Reverberant Ro...
- 4 Live music
- 5 Tinnitus Signal
- 6 Privacy



# Signia Notch Therapy

## Notch Active- Shown On Fitting Curve Screen



Signia Connexx File Edit Fitting Preferences Service Help

Home Audiogram Hearing Instruments **Fitting** Documentation

Noahlink Wireless

First Fit  Own Voice Processing Basic Tuning Fine Tuning **Frequency Shaping** Compression Frequency Compression Microphone / Audio Sound Management Sound Equalizer Measurement Settings Fitting Assistant Audio Streaming Tinnitus Personalization Disconnect Noahlink Wireless Start Remote Session... TeleCare

sDemo (Pure Charge&Go 7Nx M (119/60)) Remaining trial period: 420h

Gain (dB) MPO

Low frequency optimization

Handles	1	2	5	10
Gain (dB)	4	11	18	19
MPO	18	16	16	18
MPO	20	13		

0 0.5 1 1.5 2 2.5 3 4 6 8 12 kHz

sDemo (Pure Charge&Go 7Nx M (119/60)) Remaining trial period: 420h

Gain (dB) MPO

Low frequency optimization

Handles	1	2	5	10
Gain (dB)	4	11	18	19
MPO	18	16	16	18
MPO	20	13		

0 0.5 1 1.5 2 2.5 3 4 6 8 12 kHz

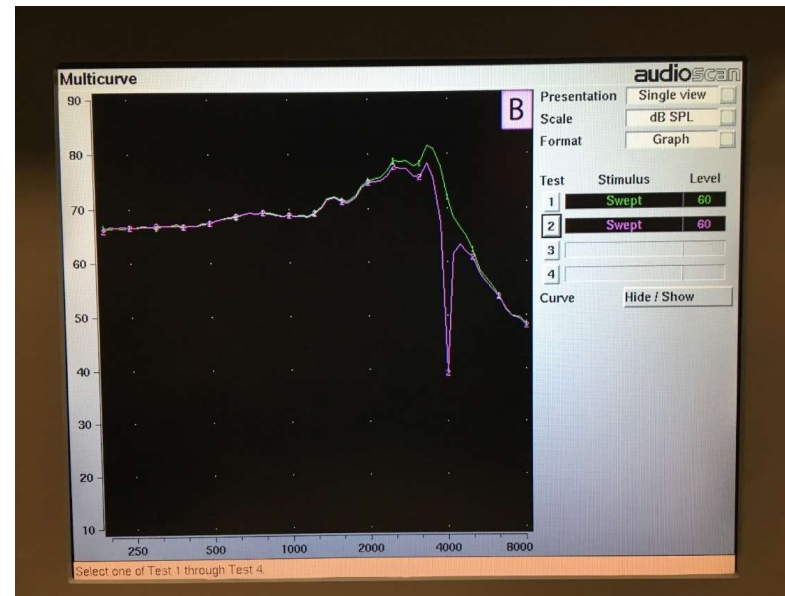
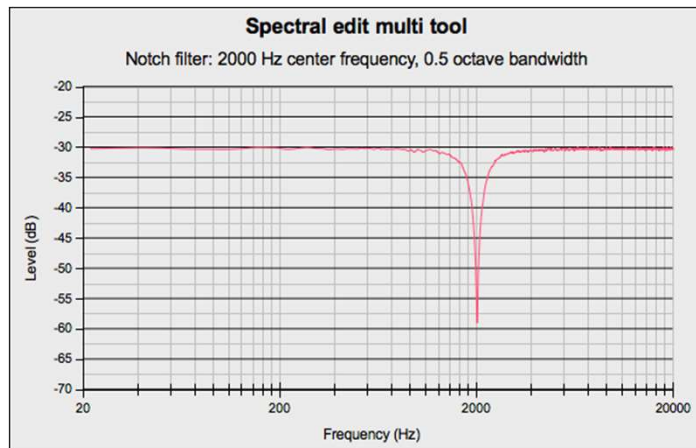
1 Universal  
2 Noisy Enviro...  
3 Recorded mu...  
4 Tinnitus Signal

Tinnitus, webinar, 10/28/1964 | Serial Number: PS12587, PS12489 | Programming device: Noahlink Wireless | Synchronized

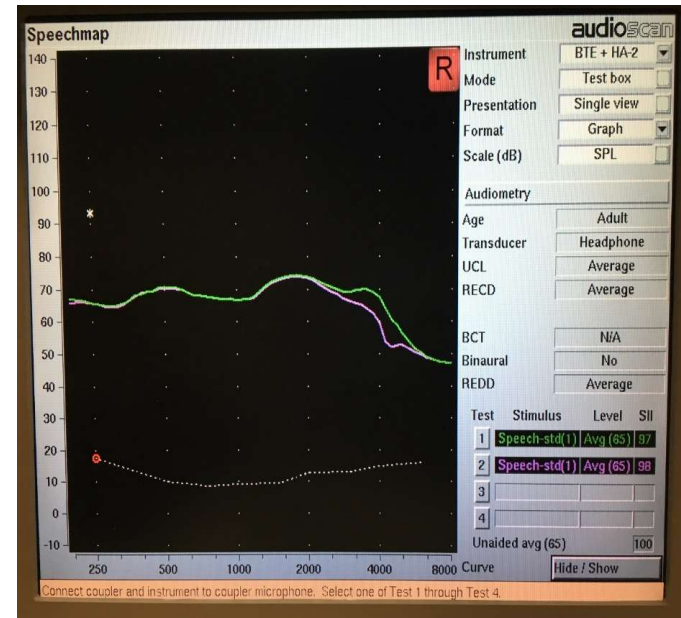
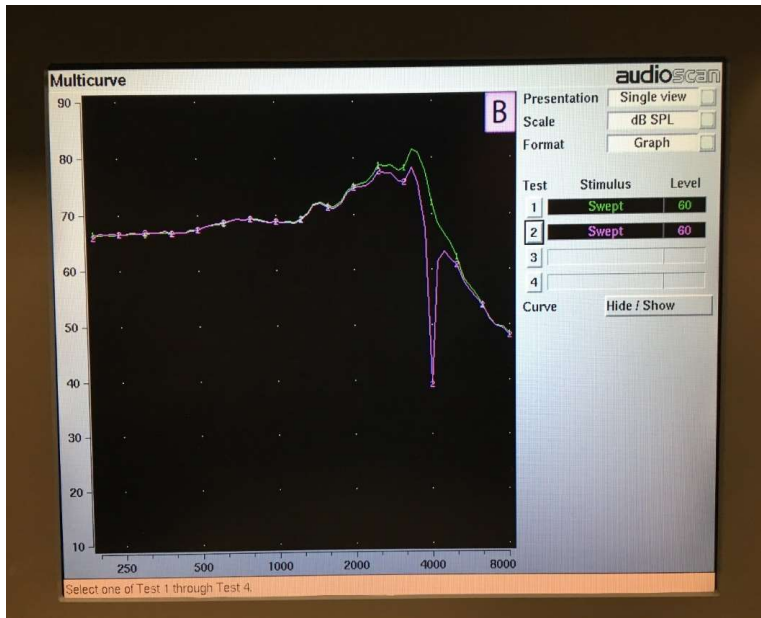


# Signia Notch Therapy

Representation of the notch filter when performing a tonal sweep with real ear measures



# Speech map with 4K Hz Notch





# Signia Notch Therapy Recommendations




- We recommend that the notch be placed in all programs.
- The width of the notch is only 0.5 octave and therefore should not interfere with normal conversation.
- However, the option of choosing to active specific programs “notch free” is provided for flexible, individualized therapy.
- The data suggests that longer wearing times are better than shorter; especially if the prescribed gain is mild and therefore, the notch depth is shallower.




# Signia Notch Therapy Resources






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## Signia Notch Therapy: A Novel Approach Clinically Proven to Reduce the Perception of Tonal Tinnitus





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## Notch Therapy How-To Guide


A therapy approach clinically proven to reduce the  
annoyance of tonal tinnitus

Tinnitus management through acoustic therapy is the treatment method of choice for many hearing care professionals. Tonal tinnitus, which includes all types of pure-tone like whistling, ringing or humming, is the most common form of tinnitus.<sup>1</sup> New research shows rather than using traditional noise therapy that treats the effects of tinnitus, spectral notching can treat tonal tinnitus from its anatomic origin. The therapeutic effects of spectral notching can be achieved by wearing hearing instruments featuring Notch Therapy.

Unlike traditional sound therapy which introduces another acoustic stimulus to the patient, Notch Therapy is inaudible and works in the background to relieve the annoyance of tinnitus. Based on the concept of "in-attracting" lateral inhibition<sup>2</sup>, Notch Therapy uses spectral notching and applies it to traditional amplification with hearing instruments. It aims to attack tinnitus on two fronts: 1) enhancing the auditory environment by amplification, 2) suppressing the tinnitus associated neural hyperactivity with enhanced lateral inhibition.

A double-blind study showed that when compared to control subjects who used hearing aid amplification alone, those who used hearing aids with Notch Therapy exhibited a clear improvement in as few as three weeks and maintained the benefit past six months.<sup>3</sup>

Notch Therapy is only available in Signia hearing instruments. Notch Therapy can be customized to treat the patient's tonal tinnitus in a few simple steps with Connex<sup>®</sup> fitting software. Find the patient's pitch match by using Guided Matching, Manual Matching, or choosing a known pitch from Direct Entry. Perform the frequency check to verify the correct octave of the pitch match and finally apply the notch to desired programs. It's that quick and easy.



1. Turner, J.S. (1990). Auditory dysfunction: Tinnitus. In H.K. Walker, W.D. Hall, & W. Hurst (Eds.), Clinical methods: The history, physical, and laboratory examinations. Boston: Butterworths.
2. Toizumi, H., Okamoto, H., & Furue, C. (2018). Short and intense talar esude notched music training against tinnitus: The tinnitus frequency matchers. PLoS ONE, 13(5).
3. Strausz, D.J., Corina Strausz, F.L., Haab, L., & Lorenzmann, R. (2015). Notched environmental sounds: a new hearing aid supported tinnitus treatment evaluated in 20 patients. Clinical Otolaryngology.



## Other Resources

Signia Website – Pages For Professionals & For Consumers

<https://www.signia-pro.com/en-us/business-support/tinnitus/>



The screenshot shows the top navigation bar of the Signia website. On the left, there is a hamburger menu icon followed by the text "Menu" and "MySignia". In the center is the Signia logo, which consists of a red circle containing a white stylized 'S' above the word "signia" in a lowercase, sans-serif font. On the right side of the navigation bar, there are icons for a search function (magnifying glass), a mail icon, and a language selector showing "en-US" with a downward arrow. Below the navigation bar, the main content area features the heading "Tune out tinnitus" in a large, bold, black font, followed by the sub-heading "Unique therapies for lasting relief" in a smaller, black font.



# Signia Notch Therapy Resources



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**Tinnitus Therapy Workbook**

[www.signia-pro.com/tinnitus](http://www.signia-pro.com/tinnitus)

**Signia's tinnitus solutions help you better serve your patients and your practice.**

Our new "Treating Tinnitus with Signia" program is continuously expanding. We are now offering several new resources to support your patients and your practice. See page 21 for patient forms.

*Tinnitus Handicap Inventory*

*Tinnitus primary function questionnaire*

*Tinnitus Case History Questionnaire*





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Thank you for  
joining us today!