
Starkey
Exploring Innovations in Tinnitus Management and Relief
For technical questions or log-in information please contact
Steven Le at 0437 622 596 Steven_Le@Starkey.com
Access Code: 2861 729 0562 if needed

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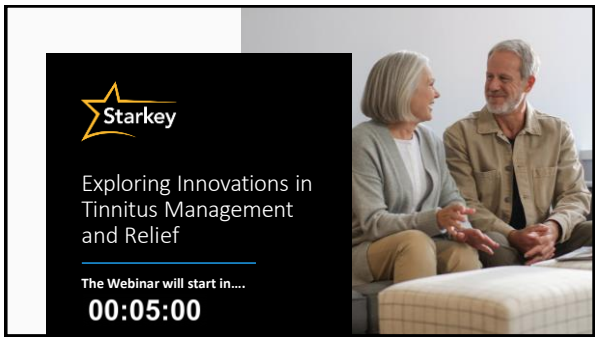
Starkey
Exploring Innovations in Tinnitus Management and Relief
The Webinar will start in....
00:05:00

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Exploring Innovations in Tinnitus Management and Relief
Judy Grobstein
Regional Director of Education and Audiology - APAC
Steven Le
Consumer Support Specialist and Trainer- ANZ
Starkey

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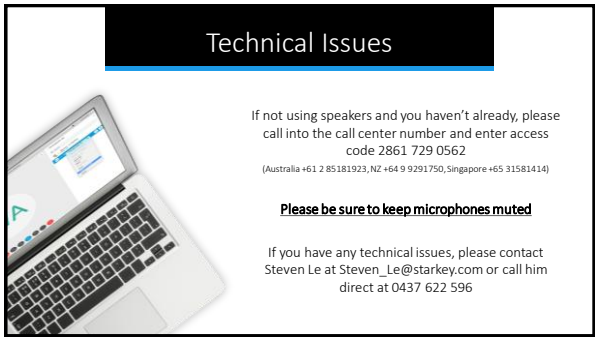
Technical Issues
If not using speakers and you haven't already, please call into the call center number and enter access code 2861 729 0562
(Australia +61 2 85181923, NZ +64 9 9291750, Singapore +65 31581414)
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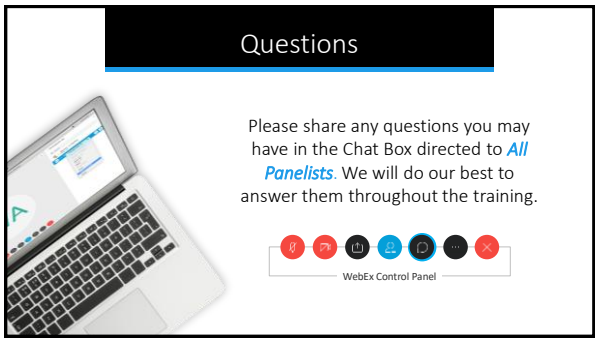
Questions
Please share any questions you may have in the Chat Box directed to All Panelists. We will do our best to answer them throughout the training.
WebEx Control Panel

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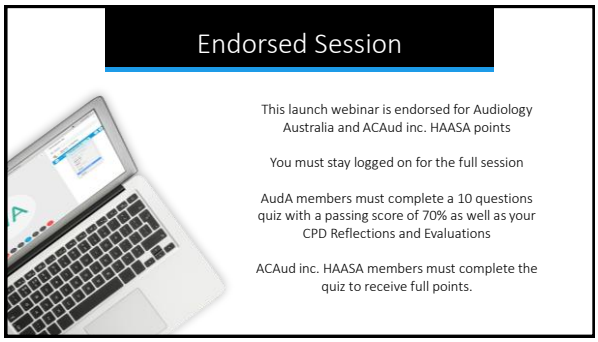
Endorsed Session
This launch webinar is endorsed for Audiology Australia and ACAud inc. HAASA points
You must stay logged on for the full session
AudA members must complete a 10 questions quiz with a passing score of 70% as well as your CPD Reflections and Evaluations
ACAud inc. HAASA members must complete the quiz to receive full points.

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Learner Outcomes

1. Identify the causes, triggers and symptoms of tinnitus
2. Discuss the sound therapy stimulus options available from Starkey
3. Describe how to adjust tinnitus controls in the Pro Fit software

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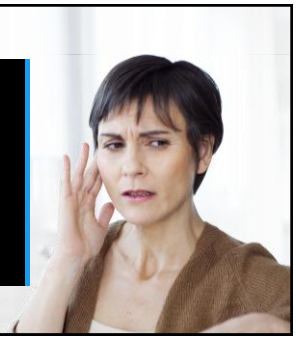
tin·ni·tus

["TIN-it-us", "tin-NITE-us"]

a symptom characterized by the perception of sound in the absence of an external stimulus



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Tinnitus

Nearly 15% of Adults **(1 in 7)** worldwide experience tinnitus

More than 740 million adults worldwide have at least one symptom of tinnitus

120 million adults are severely affected by the tinnitus they experience

American Tinnitus Association

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Classifying Tinnitus

Traditionally classified by whether it could be heard by the clinician

Objective

Audible to another person

Internal acoustic source
Ex. muscle spasms or vascular tumor

Detected via human ear, stethoscope, or microphone

Represents less than **1%** of cases

Subjective

Only heard by the patient

May be idiopathic or caused by various disorders involving the head/neck or other systems

99% of all cases

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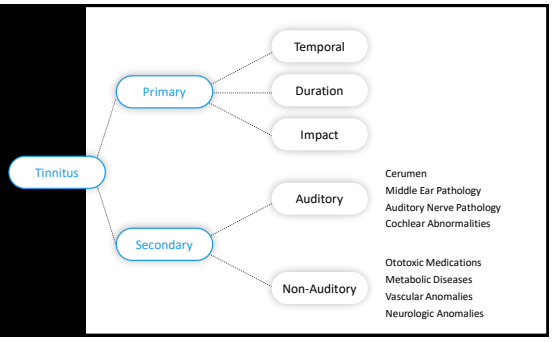

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Primary Tinnitus

TEMPORAL CHARACTERISTICS	DURATION	IMPACT
Spontaneous	Recent	Non-Bothersome
Temporary	Persistent	Bothersome
Occasional		
Intermittent		
Constant		

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Phantom Auditory Perceptions

- **Auditory Hallucinations**
- **Musical Ear Syndrome**
- **Auditory Imagination**
- **Tinnitus**

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Tinnitus Evaluation

Starkey
Hear better. Live better.

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Evaluation

- Self-Assessment
- Case History
- Audiological Assessment

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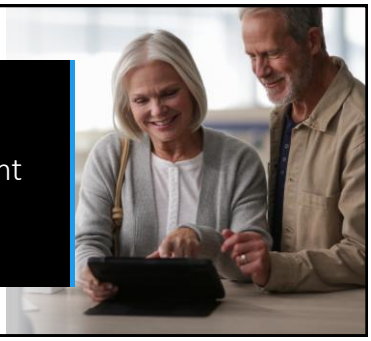
Self-Assessment



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Tinnitus Handicap Inventory (THI)

25-item questionnaire that is used to identify, quantify and evaluate the severity of difficulties that a patient may be experiencing because of their tinnitus

Probes the functional, emotional and catastrophic response reactions to tinnitus


Tinnitus Handicap Inventory (THI)

Courtesy of the American Tinnitus Association

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Tinnitus Functional Index (TFI)

25-item questionnaire assesses the severity of your tinnitus over the previous week. The questions are grouped into 8 subscales or "factors"

Intrusiveness	Auditory
Sense of Control	Relaxation
Cognition	Quality of Life
Sleep	Emotional Distress

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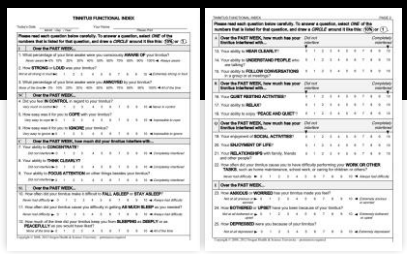
Tinnitus Functional Index (TFI)

Useful in both clinical and research settings



Oregon Health & Science University (2008, 2012)

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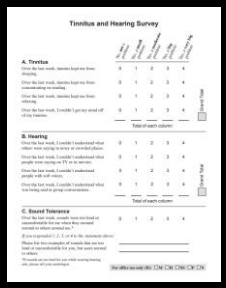
Tinnitus and Hearing Survey (THS)

Developed as a tool to rapidly differentiate hearing problems from tinnitus problems

Used in clinical trials and clinically

Also has two items that screen for sound intolerance problems



American Journal of Audiology (2015)

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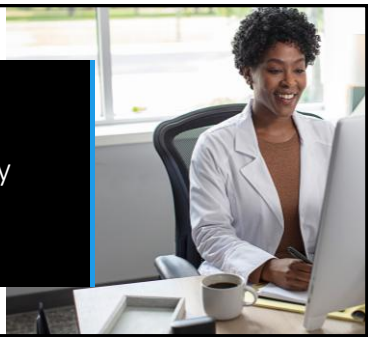
Case History



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Risk Factor for Tinnitus

Thyroid issues	Ear infection	Acoustic Neuroma
Head or neck trauma	Cardiovascular disease	
Otosclerosis	Meniere's disease	Noise exposure
Sudden hearing loss	Drugs and medications	

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Possible Risk Factor for Tinnitus

Alcohol usage	Geographic region	
Anxiety	Depression	Obesity
Lyme disease	Health status	
Genetics	Low weight	Smoking

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At Risk Populations for Tinnitus

Veterans and Military Personnel

Over 2 million veterans receive compensation for tinnitus

Men

Senior Citizens

Caucasians

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Other At Risk Populations

Workers in loud environments

Autoworkers

Firefighters/Police/EMT

Manufacturing jobs

Those who have had a traumatic brain injury

May be caused by the injury

May be caused by medications used to treat injuries

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Recreational Noise Exposure

Musicians and Music Lovers

Motorsports and Hunting Enthusiasts

Gamers

iPod/Personal Listening Device Use

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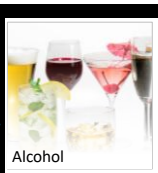
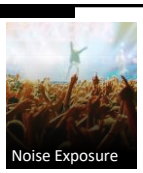
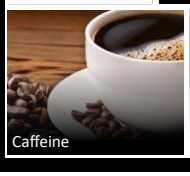
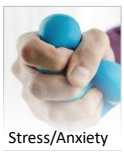
Aggravators of Tinnitus









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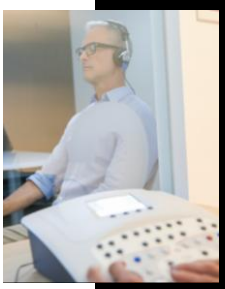
Tinnitus and Hearing Loss

Any degree of hearing loss

Any type of hearing loss

Any cause or type of onset

Changes in hearing loss and changes in tinnitus tend to occur independently of one another



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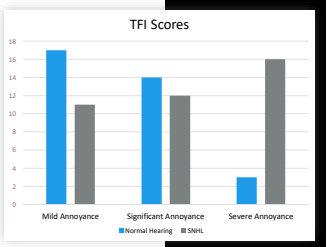
Tinnitus and Hearing Loss

No correlation between tinnitus severity and hearing threshold, though those with hearing loss are found to have a higher tinnitus severity.



Mahafza N, Zhao F, El Refaie A, Chen F. *A comparison of the severity of tinnitus in patients with and without hearing loss using the tinnitus functional index (TFI). Int J Audiol.* 2021 Mar;60(3):220-226. doi: 10.1080/14992027.2020.1804081. Epub 2020 Aug 13. PMID: 32787604.

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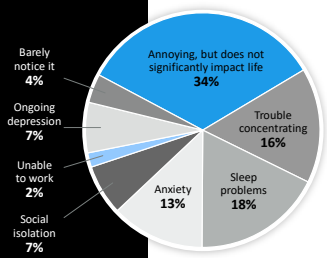

Quality of life impacts

Thoughts and Emotions

Sleep

Concentration

Socialization

Physical Health

Economic Well-being

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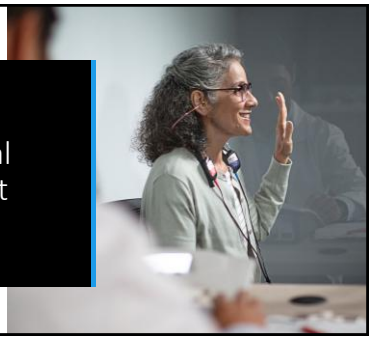
Audiological Assessment



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- Comprehensive Audiometry
- Tympanometry
- DPOAEs
- Uncomfortable Loudness Level (UCL)
- Acoustic Reflex Thresholds
- Tinnitus Sound Matching
- Minimum Masking Level

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Treatment Options

Provider Driven

Patient Driven

Referral

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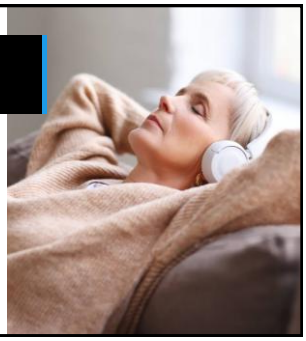
Sound Therapy

Tinnitus sound therapy uses a process known as **habituation** to retrain the way the brain interprets tinnitus.



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Sound Therapy Options

- MASKING
- DISTRACTION
- HABITUATION
- NEUROMODULATION

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Sound Therapy Devices

- Sound Masking Devices
- Bimodal Stimulation
- Hearing Aids
- Sound and Sleep Apps

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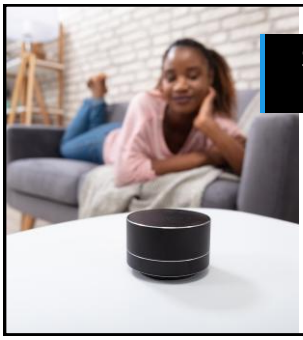

Sound Masking Devices

Sound machines offer a choice of different types of sounds in addition to white noise and can also include features like built-in clocks, alarms, night lights, app integrations and more

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Bimodal Stimulation

Bimodal stimulation is a specific approach within the broader field of neuromodulation, focusing on the simultaneous use of two sensory modalities to modulate neural activity

Tactile Stimulation
Relies on vibration to generate sensations on the skin

Electrical Stimulation
Uses electrical currents to stimulate nerves or muscles under the skin

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Maskers in Hearing Aids

Acoustic Therapy is using sound stimulation either from amplification of external sounds or the generation of additional sounds.

Tinnitus maskers are additional sounds generated that are typically set at a level below a patient's tinnitus to potentially cover it up.

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Maskers in Hearing Aids

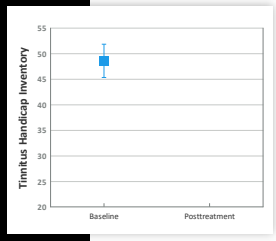
RESEARCH DATA

In this study, participants were provided multiple masker options to use at their discretion in order to achieve tinnitus relief.

Study was comprised of 26 individuals with hearing loss.

Participants completed an 8-week field trial wearing hearing aids providing acoustic therapy via three tinnitus masker options set just below minimum masking level.

Tinnitus Handicap Inventory was used before starting acoustic therapy and posttreatment to measure the patients' tinnitus handicap.



Source: *Journal of Speech, Language, and Hearing Research*, Vol. 64, 1415, Figure 2, April 2021.

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Maskers in Hearing Aids

DATALOGGING RESULTS

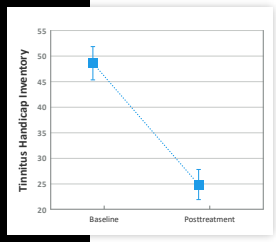
Average hearing aid use was 9.4 hr (SD = 4.2 hr) during the field trial, and

Average of 34.4% of that time was spent utilizing a tinnitus masker

13.8%
with white noise;

10.5%
with audiogram-shaped noise;

10.0%
with custom noise



Source: *Journal of Speech, Language, and Hearing Research*, Vol. 64, 1415, Figure 2, April 2021.

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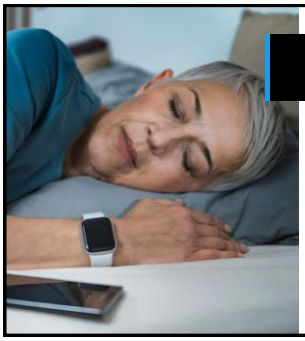

Sound/Sleep Apps

RESEARCH DATA:

22 participants with subjective tinnitus

Used application for **6 months**

A significant reduction in subjective tinnitus loudness and annoyance and subjective stress level were observed. The THI scores were significantly decreased after 6 months.

Findings demonstrate the potential benefit of the tinnitus application for tinnitus improvement

Seol, H. Y., Jo, M., & Moon, I. J. (2023). *Healthcare*, 11(17)

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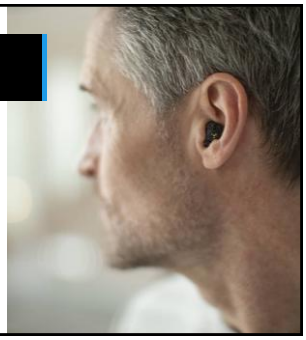
Tinnitus Protocols



Tinnitus Retraining Therapy
Dr. Pawell Jastreboff

Progressive Tinnitus Management
National Center for Rehabilitative Auditory Research

Tinnitus Activities Treatment
Dr. Richard Tyler at the University of Iowa

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Treatment Options

Provider Driven

Patient Driven

Referral

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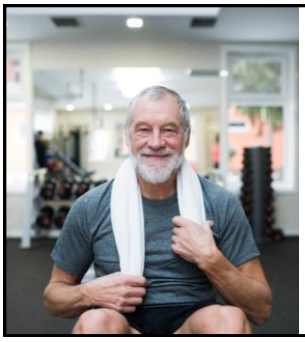

Lifestyle Management

Quit Smoking

Diet Change

Getting a better night's rest

Relaxation/Meditation

Exercise

Support Groups

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Treatment Options

Provider Driven

Patient Driven

Referral

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Cognitive Behavioral Therapy

Modify thoughts and beliefs to decrease negative behaviors

Cognitive Skills
Reduce negative thinking, develop a habituation perspective on tinnitus, and become an effective self-coach to guide yourself through the process

Mindfulness Skills
Calm down, promote tinnitus acceptance, and regain control of attention

Self-Guided Sound Enrichment
Soften your perception of tinnitus

Behavioral Skills
Take the courageous action needed to **fully** rejoin your life

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Multiflex Tinnitus Pro

Judy Grobstein
Regional Director of Education and Audiology- APAC

Starkey

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Multiflex Tinnitus Pro

Next generation feature for sound therapy tinnitus management

EDGE AI

Signature SERIES

AVAILABLE ON ALL STYLES

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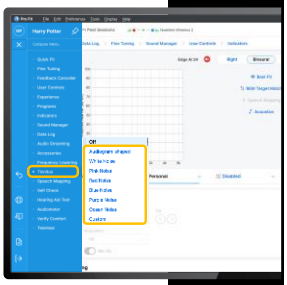
Multiflex Tinnitus Pro

Accessed from the Fly Out Menu within Pro Fit

Use the dropdown menu to select the stimulus type

All options offer a 10,000 Hz bandwidth with 16 bands of adjustability



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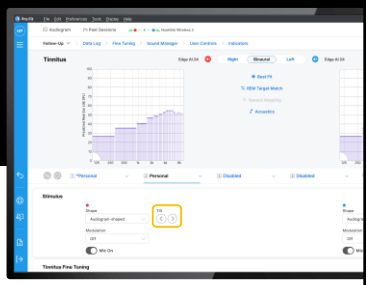
Tilt Control

Changes the shape and loudness of the masker

Adjusts gain as a function of frequency



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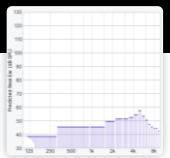
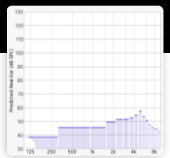
Tilt Control

Low Frequency Emphasis



Start

High Frequency Emphasis



Start

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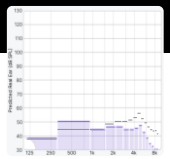
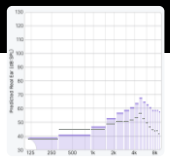
Tilt Control

Low Frequency Emphasis



5 clicks

High Frequency Emphasis



5 clicks

= Original response

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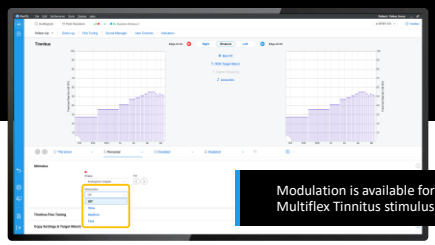
Modulation



Modulation is available for all the Multiflex Tinnitus stimulus options

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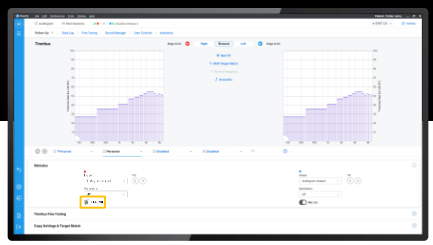
Mic ON/OFF



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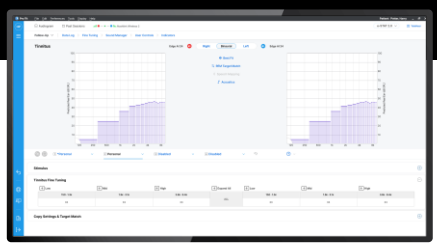
Tinnitus Stimulus Fine Tuning



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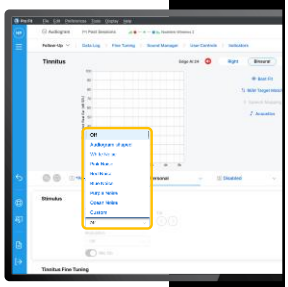
Tinnitus Stimuli

Eight Stimulus Options

- Audiogram-Shaped Noise
- White Noise
- Pink Noise
- Red Noise
- Blue Noise
- Purple Noise
- Ocean Noise
- Custom Noise*

* 24 & 20 tech tiers



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Starkey **Pro Fit**

White Noise

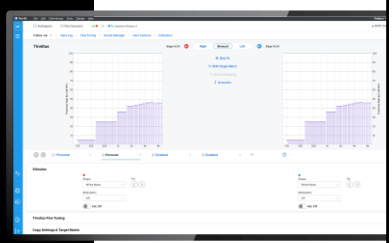
Tinnitus

Signal level based on the PTA and comprised of equal energy distribution across the frequencies.

Flat response may result in some segments of the stimulus being too loud or too soft

Vent interactions are accounted for

Stimulus is adjustable



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Starkey **Pro Fit**

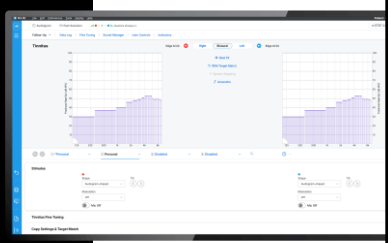
Audiogram Shaped

Tinnitus

Automatic shaping of the stimulus based on the hearing loss provides a more tailored masking stimulus

Vent interactions are accounted for

Stimulus is adjustable



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Noise Colors

- White
- Pink
- Brown
- Blue
- Purple

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Noise Colors

Volume

The amplitude of the sound, perceived as how loud a sound is

A louder sound may be more effective at masking external noises

Frequency

How high or low-pitched is a sound

Noise with lower frequencies may promote relaxation and calmness

Noises with higher frequencies may improve focus and concentration

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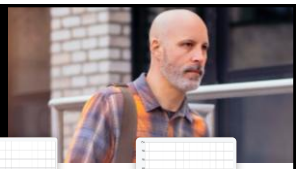
Multiflex Tinnitus Pro

Low-frequency weighted options



OCEAN NOISE
Mimics the sound of the ocean for an alternative masker to traditional options

PINK NOISE
Comprised of less high-frequency energy compared to White Noise

RED NOISE
Comprised of less high-frequency energy compared to Pink Noise

All Styles and Technology Tiers of Edge AI and Signature Series

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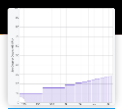
Multiflex Tinnitus Pro

High-frequency weighted options



BLUE NOISE
Comprised of less ow-frequency energy compared to White Noise

PURPLE NOISE
Comprised of less low-frequency energy compared to Blue Noise

All Styles and Technology Tiers of Edge AI and Signature Series

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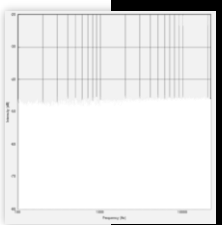
White Noise

Characterized by equal energy across all frequencies

White noise sounds like static or a hissing sound

The range between 40 Hz and 60 Hz contains the same energy as the band between 400 Hz and 420 Hz, as each of these bands is 20 Hz wide



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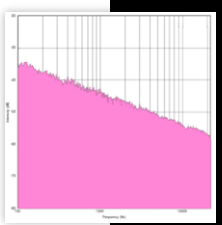
Pink Noise

Like white noise, pink noise also contains sound across all frequencies

It sounds like light rainfall or rustling leaves

Characterized by equal power across octaves – thus, there is more energy concentrated in the low pitches



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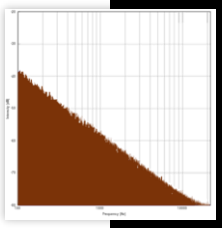
Brown Noise

Brownian, or brown, noise is sometimes called red noise

The energy of brown noise decreases by about 6 dB/octave

Sounds like steady rain, thunder, or a waterfall



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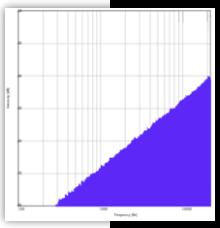
Blue and Purple Noise

Blue noise has sound concentrated in higher frequency bands

Intensity increases by about 3 dB/octave

Violet, or purple, noise has even more sound concentrated in high frequency banks

Intensity increases by about 6 dB/octave



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Starkey **Pro Fit**

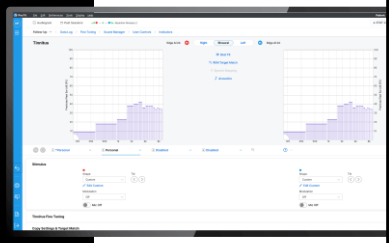
Custom

Tinnitus

Custom shaping of the stimulus provides a personalized stimulus for a greater degree of masking precision

Vent interactions are accounted for

Stimulus is adjustable



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Efficient and Effective Masking

Stimulus Personalization Testing in Inspire typically only takes a few minutes and is less time consuming than tinnitus measurements like pitch-matching

MDL and MML measurements can be used to rapidly design a stimulus that is both efficient and effective at masking tinnitus

To efficiently mask tinnitus, only those frequency bands that are effective at masking tinnitus should be included in the stimulus, and the level of the stimulus in these bands should be no greater than needed to achieve masking

Fournier et al., 2018

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Multiflex Tinnitus Pro Tool Display

Active frequency region

Instructions

Stimulus Controls

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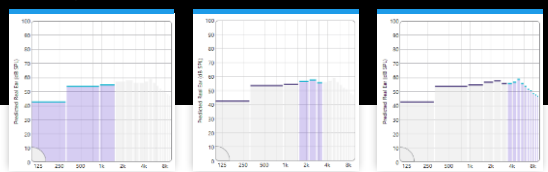
Frequency Groups

Frequency groupings are consistent with the low, mid and high band groupings in Pro Fit



Low
150 Hz to 1.3 kHz

Mid
1.9 kHz to 3.1 kHz

High
3.8 kHz to 9.4 kHz

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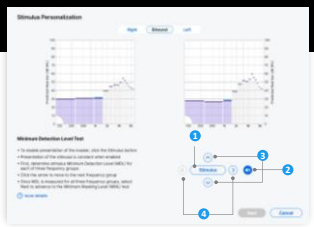
Minimum Detection Level (MDL) Test



GOAL

To identify the softest detectable level of the Multiflex Tinnitus stimulus

1. Click on the 'Stimulus' button to turn it ON
2. Hearing aid microphones will mute automatically when the stimulus is ON
3. Use the up and down arrows to increase or decrease the level of the stimulus in the frequency group displayed to ***identify when the stimulus is just detectable***
4. Use the right and left arrows to make measurements in the other frequency groups

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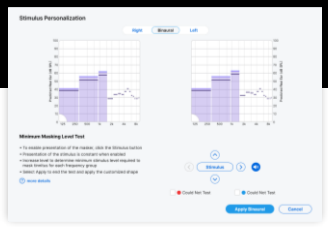
Minimum Masking Level (MML) Test

GOAL

To identify the softest level of the Multiflex Tinnitus stimulus required to just notice or mask the tinnitus depending on the management approach of choice



Display and controls are the same for this test

Increase the stimulus level to determine ***the softest stimulus level required to just detect or mask the tinnitus*** for each of the three frequency groups

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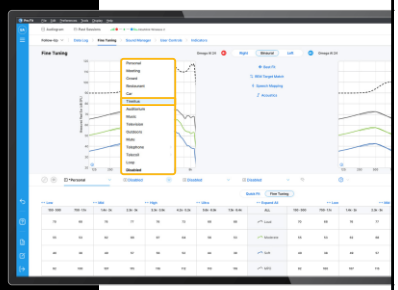
ALL NEW

Tinnitus Program

Tinnitus may be enabled from the Program dropdown



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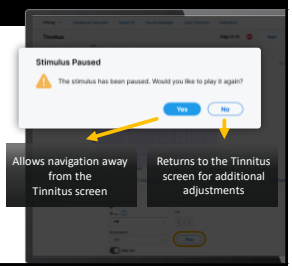
ALL NEW

Tinnitus Play/Pause

Tinnitus Play/Pause allows professionals to consider the stimulus shape and settings prior to playing the stimulus

Defaults 'Paused'

The tinnitus stimuli must be playing to navigate away from the Tinnitus screen



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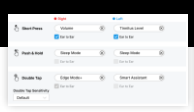
Tinnitus Stimulus

User Controls



Output Range and Step Size

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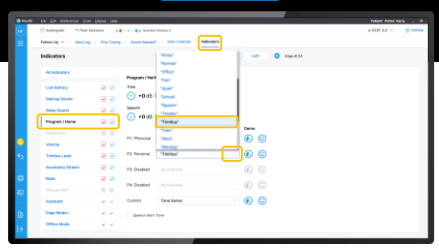
Changing Indicators for Tinnitus Program



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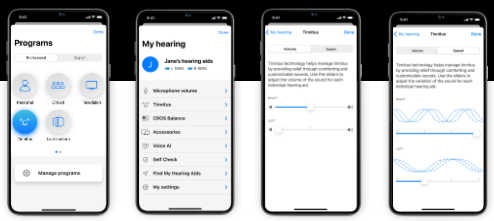
My Starkey Controls



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Tech Tier and Style Differences

	Edge AI & Signature Series	Genesis AI
White Noise	All styles and tiers	All styles and tiers
Audiogram-shaped	All styles and tiers	All styles; 24, 20, & 16
Custom Masking	All styles; 24 & 20	All styles; 24 & 20
Color Masking	All styles and tiers	N/A
Ocean	All styles and tiers	N/A

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relax

Relief sounds and education for patients who have tinnitus

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Starkey Relax App

Tinnitus Education

12 Stimuli Options

Set Modulation, Volume, and Timer

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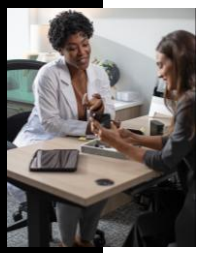

"The quickest way to ruin a customer experience in healthcare is to treat everyone the same

Patients don't want to feel like just another number

They crave personalized service that helps them find the right solutions"

Hyken, S.
Personalized Customer Experience Increases Revenue And Loyalty

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Tinnitus Resources

American Tinnitus Association
www.ata.org

Tinnitus Research Initiative
www.tinnitusresearch.net

National Center for Rehabilitative Auditory Research (NCRAR)
www.ncrar.research.va.gov/Education/Documents/TinnitusDocuments

American Academy of Audiology
www.audiology.org

Tinnitus Retraining Therapy
www.tinnitus-pjj.com

University of Iowa Tinnitus & Hyperacusis Research
www.medicine.uiowa.edu/oto/research/tinnitus-and-hyperacusis

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Resources

StarkeyPro.com

Multiflex Tinnitus Pro QuickTIP

Multiflex Tinnitus Technology Handbook

Tinnitus Handicap Inventory Questionnaire

Tinnitus Consumer In Office Poster

Patient Education Brochure: Tinnitus

Tinnitus Technology Options Brochure


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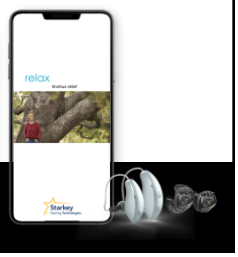
Starkey Resources

StarkeyPro.com

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How did we do?

Starkey

We'd love your feedback on today's training session

APAC StarkeyLearn Training Survey

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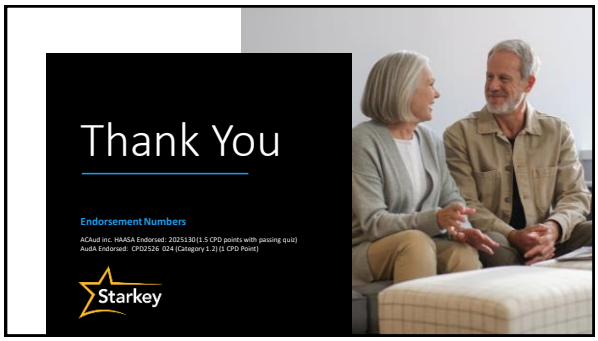
Thank You
Endorsement Numbers
ACAud inc. HAASA Endorsed: 2025130 (1.5 CPD points with passing quiz)
AudA Endorsed: CPD2526 024 (Category 1.2) (1 CPD Point)
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