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CAN INNOVATIONS IN SOUND THERAPY SUPPORT RELAXATION,
CONCENTRATION, AND WELL-BEING FOR ALL HEARING AID USERS?



PRESENTED BY KYLE HARBER, AUD

KYLE HARBER, AUD

MANAGER, CLINICAL EDUCATION-CENTRAL
WIDEX USA, INC.



AGENDA



- ZEN and Tinnitus Approach
- Widex SoundRelax™ Opportunities
- Unique and Revolutionary Amplification
- Research Review
- Summary

LEARNING OUTCOMES



After this course participants will be able to:

- Identify three new options that have been added to previous Widex ZEN tinnitus solutions.
- Describe the benefits of utilizing Widex SoundRelax in combination with PureSound.
- Make adjustments within Widex Compass GPS software to provide new tinnitus and sound therapy solutions for their patients.

SPEAKER DISCLOSURE

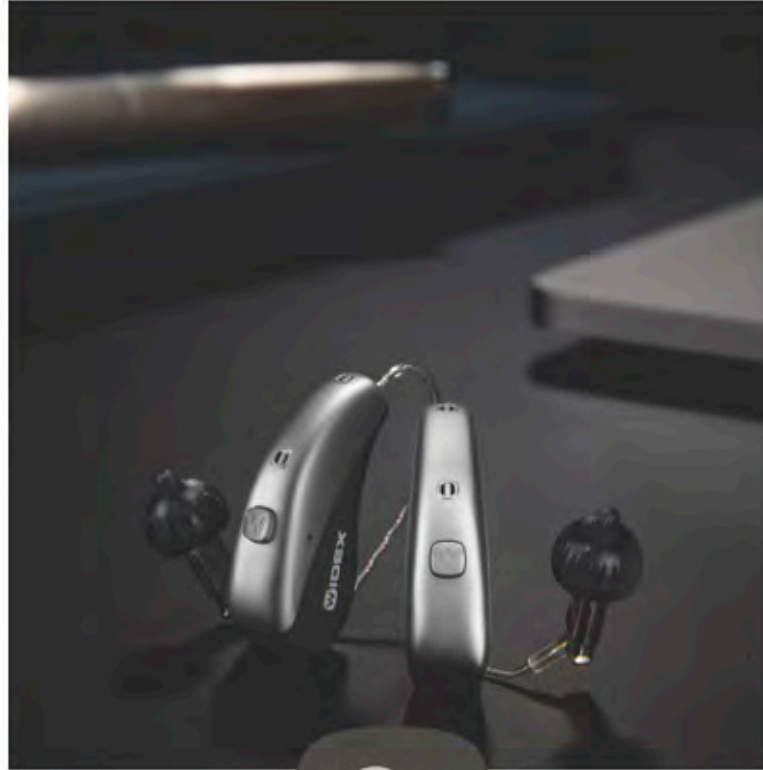


- Relevant Financial Relationships:
 - Presenter is an employee of Widex USA and receives financial compensation.
- Relevant Nonfinancial Relationships:
 - There are no nonfinancial relationships.

THE WIDEX DIFFERENCE



Audiology Ally



Unique Technology



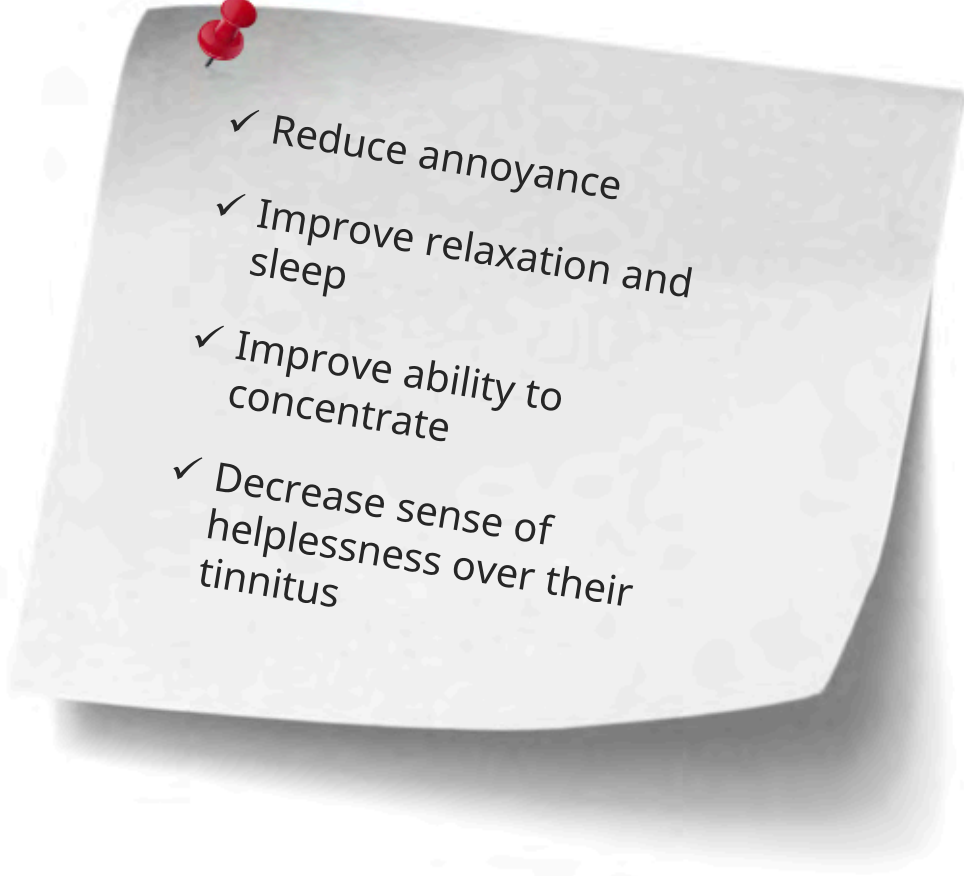
Premium Experience

ZEN AND TINNITUS APPROACH





WHAT'S OUR GOAL?

- 
- ✓ Reduce annoyance
 - ✓ Improve relaxation and sleep
 - ✓ Improve ability to concentrate
 - ✓ Decrease sense of helplessness over their tinnitus

WHAT IS HABITUATION

- A natural process
- Adaptation to a stimulus following repeated exposure



THE WIDEX APPROACH TO TINNITUS MANAGEMENT: WIDEX ZEN THERAPY



WIDEX ZEN TONES – FRACTAL TONES

- Patented by Widex
- Continuous “chime-like” musical tones generated real time
- Completely personalized to that individual’s audiogram
- Recognizable pattern that never repeats itself
- Specially created to facilitate habituation and relaxation
 - A natural process
 - Adaptation to a stimulus following repeated exposure



FLEXIBILITY TO PERSONALIZE



5 ZEN STYLES TO CHOOSE FROM

	Default pitch				Tonality		Dynamic range		Default tempo		
Fractal styles	Low	Medium low	Medium high	High and reverberant	Major	Minor	Restricted	Broad	Slow	Medium	Fast
Aqua	☒				☒		☒		☒		
Coral			☒			☒		☒	☒		
Lavender			☒		☒			☒			☒
Green				☒	☒		☒			☒	
Sand			☒		☒			☒			☒

2 NOISE OPTIONS



- ZEN NOISE (WHITE)
- SHAPED NOISE (FILTERED)

WHAT ARE THEY BASED ON?



- Each Zen color
 - **Aqua-** pop
 - **Coral-** Country
 - **Green-** Jazz
 - **Lavender-** Rock/Alt. Rock
 - **Sand-** Eastern/Middle Eastern
 - **Noise-** white noise balanced across freq. spectrum for pt.'s HL

BENEFITS OF FRACTAL TONES

- Randomized tones based on the relaxing properties of music
- Activate many neural structures
- Promote passive listening
- Facilitate habituation
- Reduce the distraction and annoyance of tinnitus
- Reduce stress with a calming effect



HISTORY OF SUCCESS

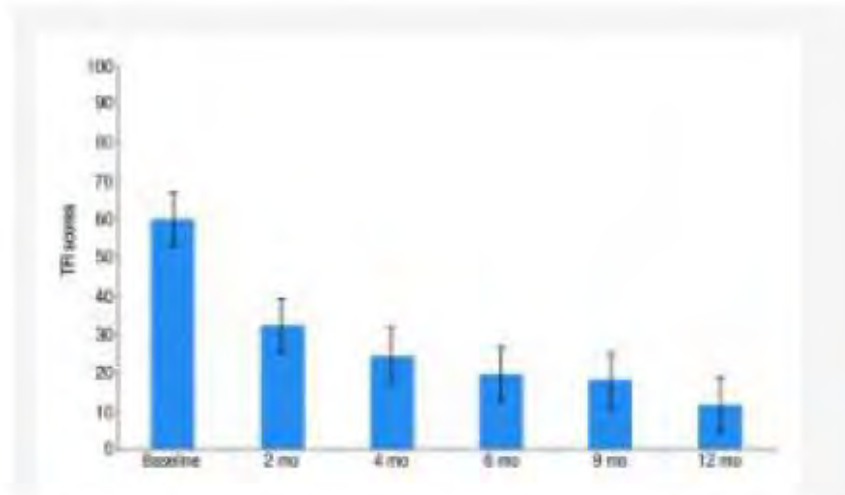


Figure 7: Mean Tinnitus Functional Index Scores at Baseline, 2, 4, 6, 9 and 12 months.

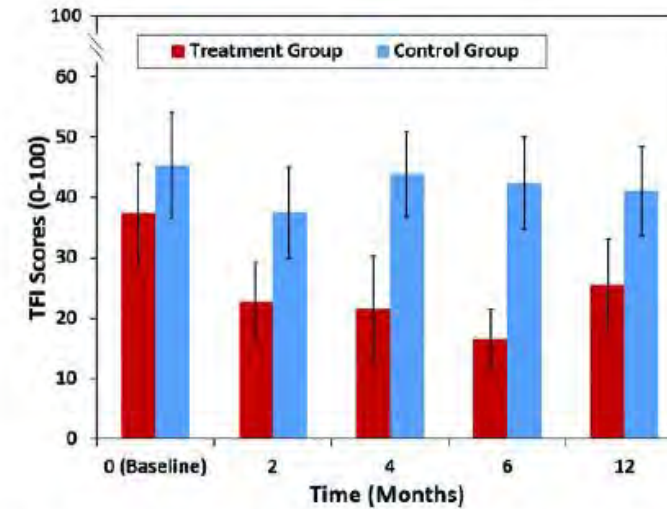


Figure 8: Mean TFI scores at baseline, 2, 4 and 6 months for the 2 treatment sub-groups.

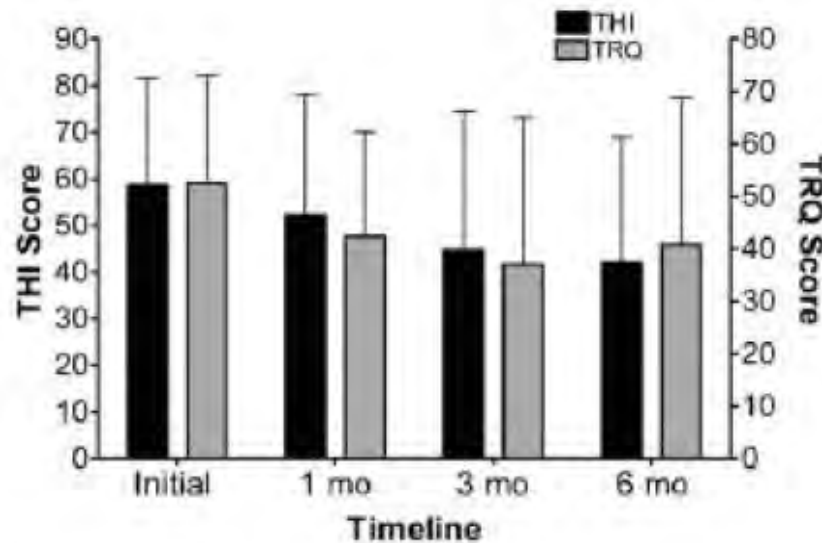


Figure 5: Mean THI and TRQ scores as a function of visit.

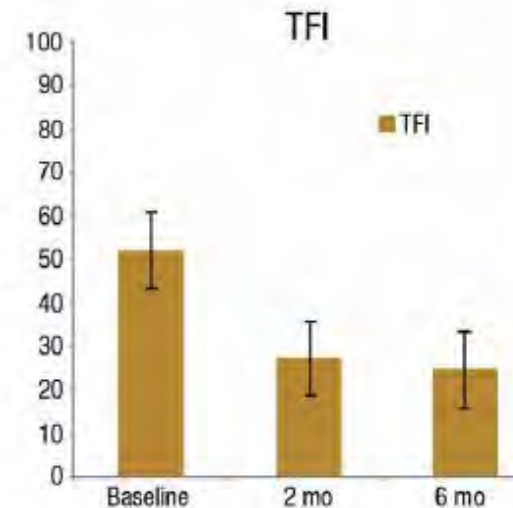


Figure 6: TFI scores for study by Herzfeld et al. (2014).

TECHNOLOGY LEVELS

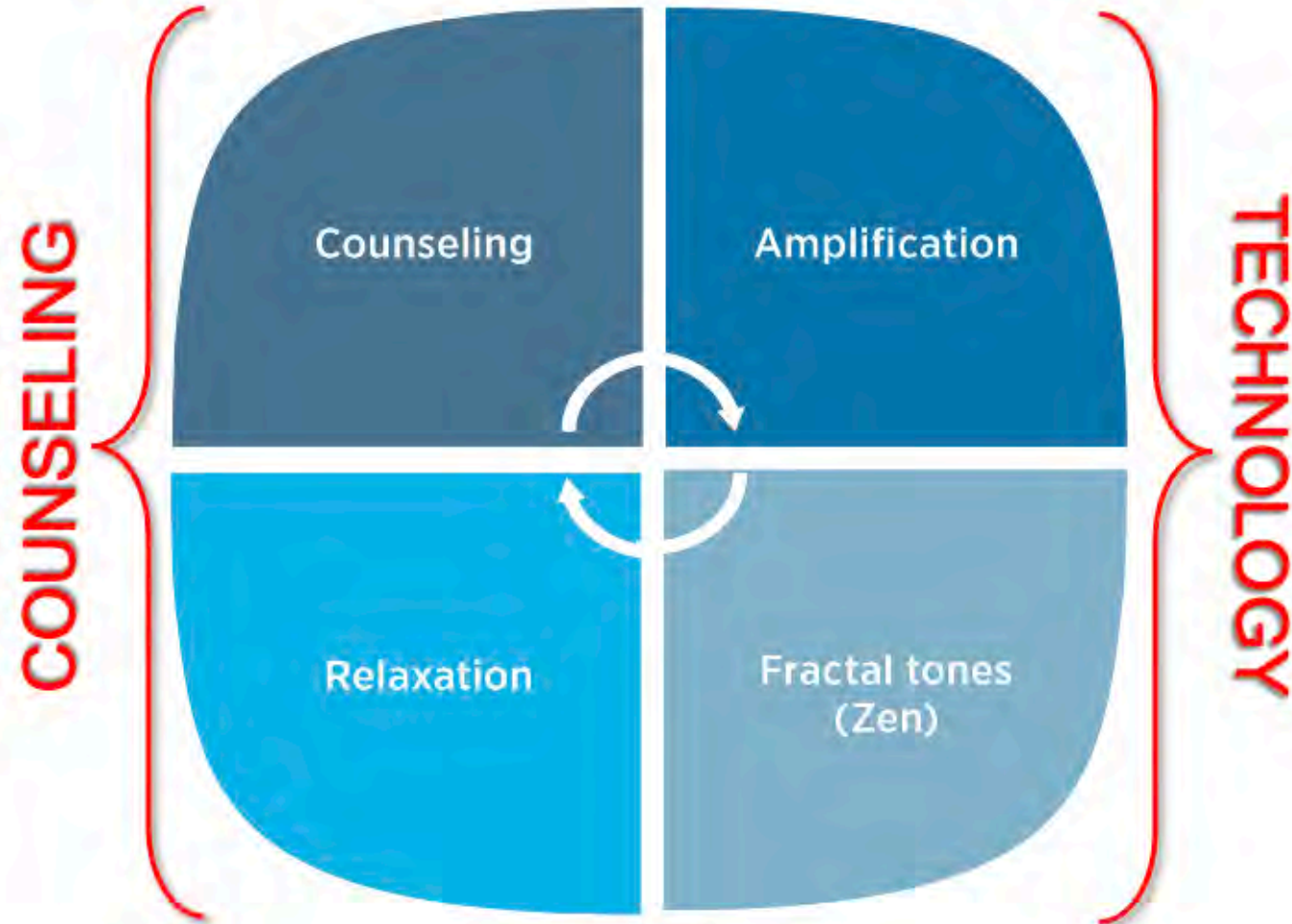
KEY FEATURES	440	330	220	110
<i>Performance</i>				
Processing and fine.tuning channels	15	12	10	6
<i>CONNECTIVITY</i>				
2.4 GHz control (Android and iOS)*	•	•	•	•
2.4 GHz audio streaming (iOS)*	•	•	•	•
WidexLinko to DEXo assistive devices* *	•	•	•	•
Telecoil	•	•	•	•
<i>APPS FOR iOS AND ANDROID</i>				
WIDEX MOMENTo App	•	•	•	•
WIDEX MOMENTo App with SoundSense Learn*	•	•	•	
TONELINKo App	•	•	•	•
COM-DEXo App	•	•	•	•

KEY FEATURES	440	330	220	110
Adaptation Manager	•	•	•	•
Fluid Sound Analyser (sound classes)	11 (IE)	7 (IE)	4	3
Programs	5	4	3	3
Impact program	•			
Comfort program	•	•	•	
SMARTWIND Managero	•			
High-frequency boost	•			
Speech Enhancer RT	RT/IE	IE		
Digital Pinna	•	•		
HD Locator	•	•	•	
TruSound Softener	•	•	•	
SoundSense Adapt	•	•	•	
Preference Control	•	•	•	•
Programmable Push Button* * *	•	•	•	•
Soft-level noise reduction	•	•	•	•
Noise Reduction	•	•	•	•
ZEN IE	•	•	•	•
Audibility Extender	•	•	•	•

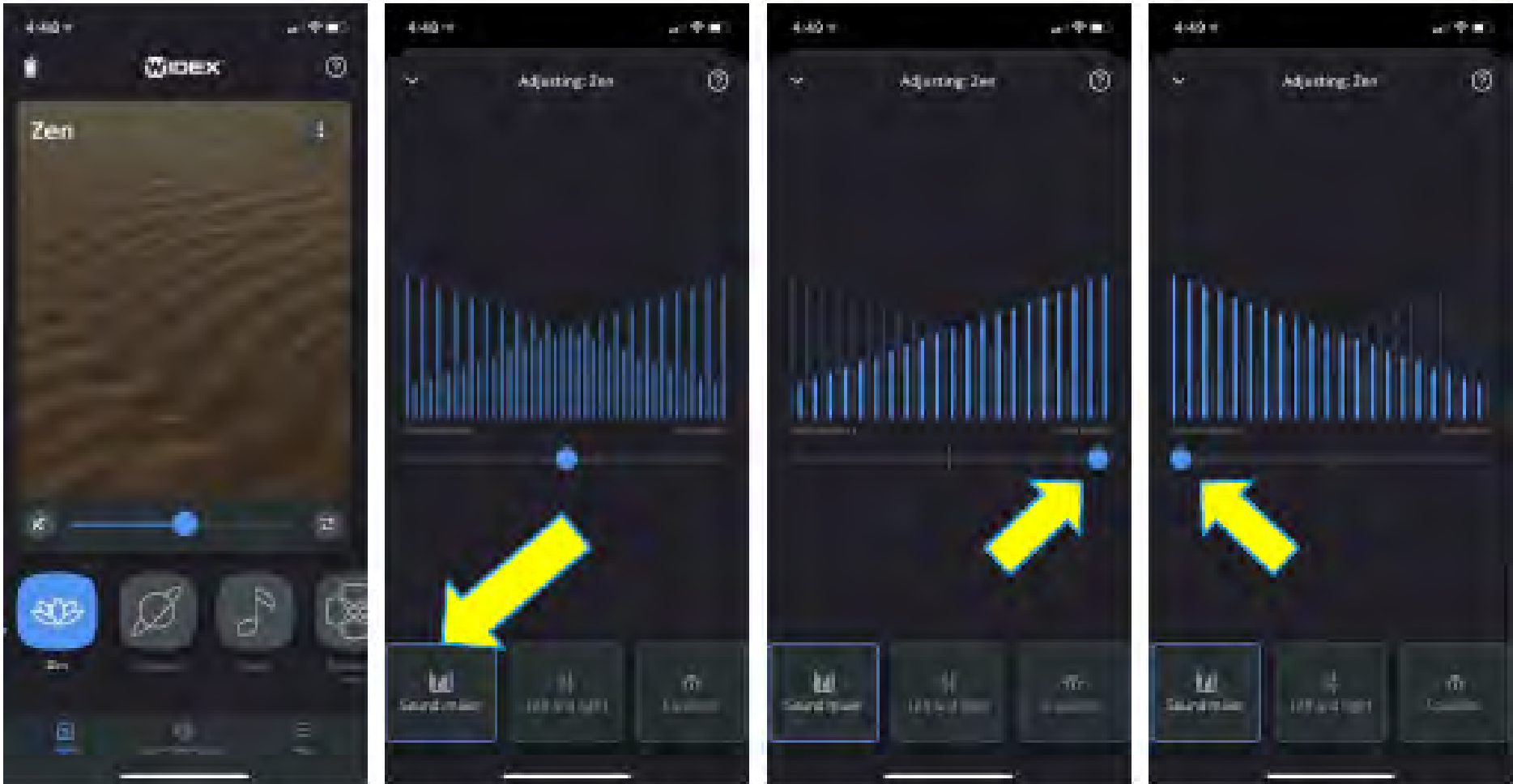
TREATMENT GOALS & REASONABLE EXPECTATIONS



COMPONENTS OF WIDEX ZEN THERAPY (WZT)



MOMENT APP





Widex ZEN, Tinnitus Management



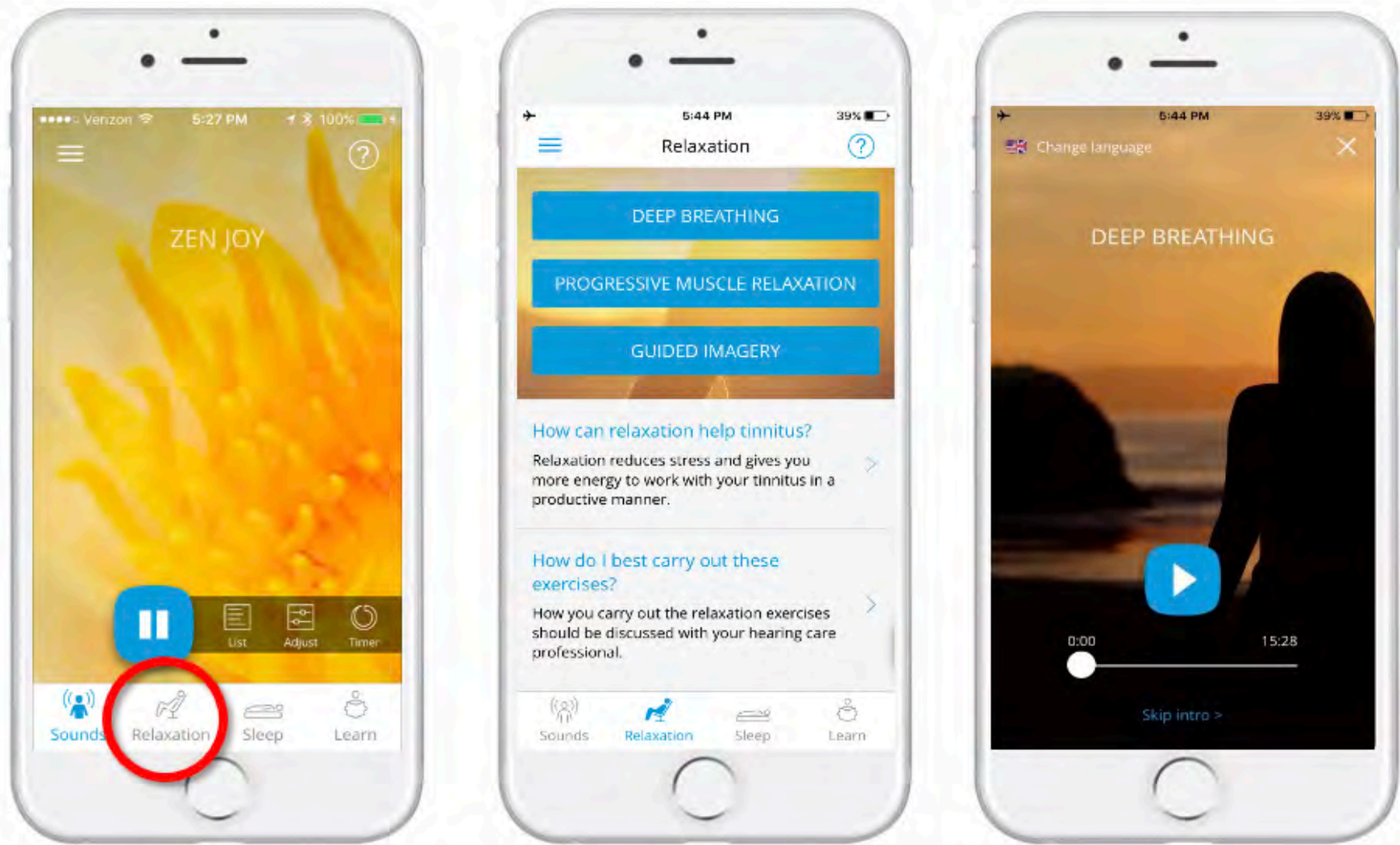
Apple App Store



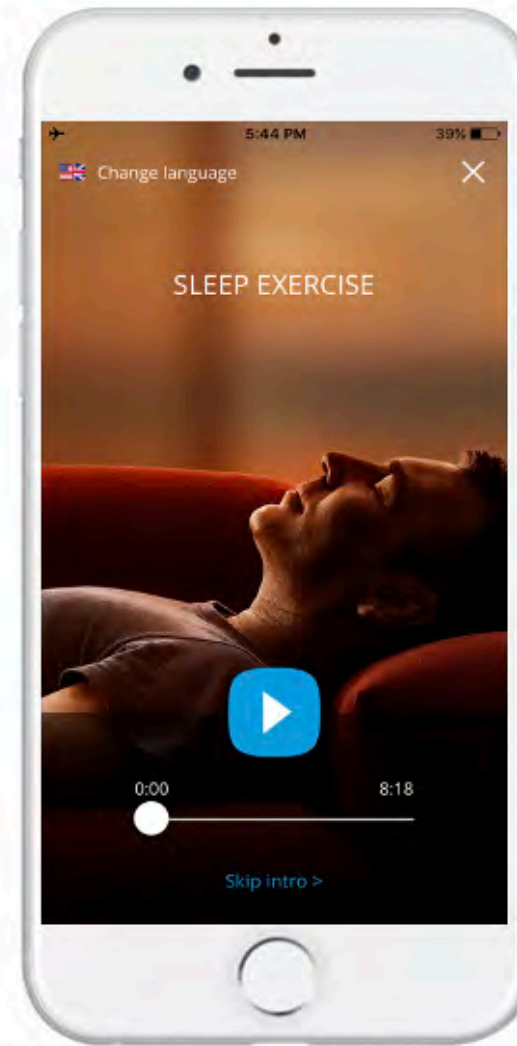
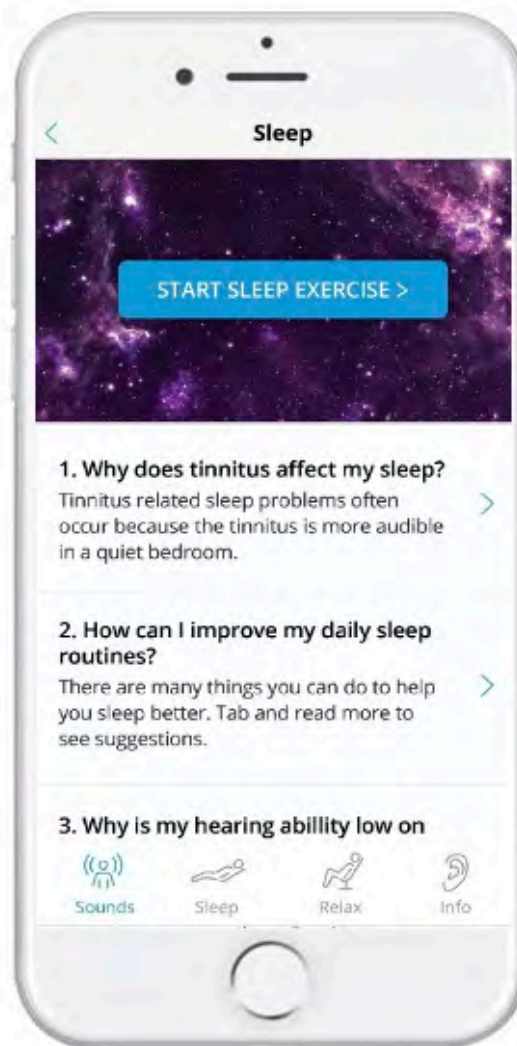
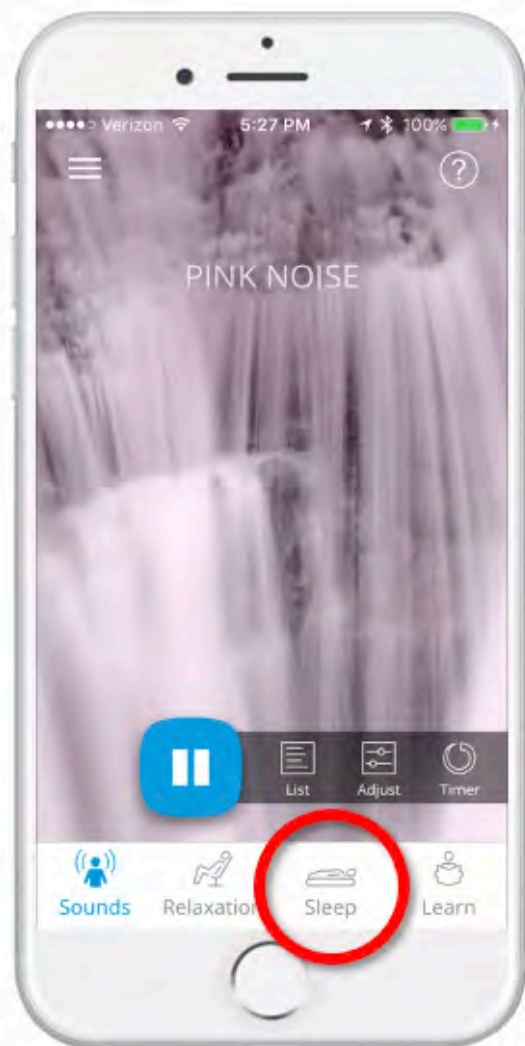
Google Play Store



GUIDED RELAXATION EXERCISES VIA TINNITUS APP



SLEEP EXERCISES



STRESS AND CONSEQUENCES



SIGNIFICANCE OF STRESS



- Stress is linked to significant health problems
 - Heart disease. Stress can directly increase heart rate and blood flow, and causes the release of cholesterol (Dr Ahmed Tawakol 2017)
 - Asthma. Many studies have shown that stress can worsen asthma. (Chen 2007)
 - Obesity. "Stress.. seems to increase the amount of fat that's deposited in the abdomen." (Jay Winner 2008)
 - Diabetes. Increases likelihood of bad behaviours, unhealthy eating and drinking. Raise glucose levels in type 2 diabetes directly. (Surwit RS 1992)
 - Depression and anxiety. Chronic stressful life situations can increase the risk of developing depression (Gustavo E. Tafet 2016)
 - Gastrointestinal problems. Stress is a common factor in many gastrointestinal conditions, (MAYER 2000)
 - Alzheimer's disease. New research: Chronic stress may contribute to the development of Alzheimer's disease. (Milligan Armstrong 2021)
- Impact of stress is worrying
- Ways to reduce stress
- Introducing relaxation

MUSIC REDUCES STRESS AND HELPS RELAX



Studies show that:

- Listening to music can help older people to **reduce depression level**
- **Valuable effect** of music therapy on anxiety and depression in patients with mild to moderate Alzheimer's disease
- **Profound effects** were found when 'relaxation' was stated as the reason for music listening:
 - **decreases** in subjective stress levels
 - **lower cortisol concentrations**

Koelsch, S., Fritz, T., Schulze, K., Alsop, D. & Schlaug, G. (2005) Adults and children processing music: An fMRI study. *NeuroImage* 25:1068 – 76. [CSA, CLK]
Linnemann A, Ditzel B, Strahler J, Doerr JM, Nater UM. Music listening as a means of stress reduction in daily life. *Psychoneuroendocrinology*. 2015 Oct;60:82-90. doi: 10.1016/j.psyneuen.2015.06.008. Epub 2015 Jun 21. PMID: 26142566.
Guétin S, Portet F, Picot MC, Pommié C, Messaoudi M, Djabelkir L, Olsen AL, Cano MM, Lecourt E, Touchon J. Effect of music therapy on anxiety and depression in patients with Alzheimer's type dementia: randomised, controlled study. *Dement Geriatr Cogn Disord*. 2009;28(1):36-46. doi: 10.1159/000229024. Epub 2009 Jul 23. PMID: 19628939.
Chan MF, Wong ZY, Onishi H, Thayala NV. Effects of music on depression in older people: a randomised controlled trial. *J Clin Nurs*. 2012 Mar;21(5-6):776-83. doi: 10.1111/j.1365-2702.2011.03954.x. Epub 2011 Oct 31. PMID: 22035368.

INTRODUCING WIDEX SOUNDRELAX_o



WIDEX SOUNDRELAXo

Live better through greater
relaxation and concentration
whenever and wherever needed





WIDEX SOUNDRELAX™

In 2008, with ZEN tinnitus and relaxation therapy, Widex revolutionized tinnitus management

Utilizing fractal technology, Widex has for many years offered proven therapeutic techniques for tinnitus clients

Now Widex is continuing our philosophy of providing benefit for all clients by launching **Widex SoundRelax**, opening up the benefits of fractal tones to more people

Widex SoundRelax applies the benefits of fractal generated sounds to the fields of relaxation and concentration

We see the future with Widex SoundRelax as user driven - to be enabled whenever and wherever needed.

WIDEX SOUNDRELAX – EXPANDING OPTIONS



WIDEX SOUNDRELAX

SOUNDS FOR WELL-BEING

WELL-BEING

Well-being
Relaxation
Concentration

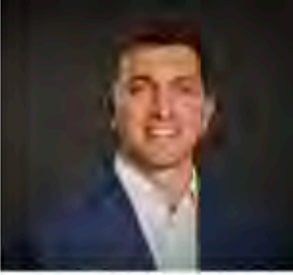
SOUNDSCAPES

Fractal tones
Modulated Wave-like sounds

PURE SOUND

New program base
for Zen and SoundRelax

WIDEX SOUNDRELAX – EXPANDING OPTIONS



WIDEX
SOUNDRELAX

SOUNDS FOR WELL-BEING

WELL-BEING

Well-being
Relaxation
Concentration

SOUNDSCAPES

Fractal tones
Modulated Wave-like sounds

PURESOUND

New program base
Sound quality
Attractive to more

WELL-BEING

Helps relax and focus

Tinnitus / no tinnitus

Evidence backed



AUDIOLOGY CORE STORIES

WIDEX
SOUNDRELAX

SOUNDS FOR WELL-BEING

WELL-BEING

Well-being
Relaxation
Concentration

SOUNDSCAPES

Fractal tones
Modulated Wave-like sounds

PURESOUND

New program base
Sound quality
Attractive to more

WIDEX SOUNDRELAX STYLES OVERVIEW



	DEFAULT PITCH			DYNAMIC RANGE		DEFAULT TEMPO			TIMBRE			DEFAULT WAVES		
FRACTAL STYLE	LOW	MEDIUM	HIGH	RESTRICTED	BROAD	SLOW	MEDIUM	FAST	CLEAR	SOFT/ PURE	FLUTES	ORGANIC	ON	OFF
SUMMER	■			■			■					■	■	
BREEZE	■			■		■				■				■
SPRING			■	■			■			■			■	
WINTER		■			■		■		■					■
BLOSSOM		■			■		■				■		■	
AUTUMN		■		■			■					■		

*The noise soundscapes do not include tones and are therefore not represented in the table

LARGE VARIETY OF SOUNDSCAPES TO CHOOSE FROM
CATERS TO MANY USERS

SOUND DEMO WIDEX SOUNDRELAX



WINTER



SPRING



SUMMER



FALL



BLOSSOM



BREEZE



SEASIDE



SWELLS



SOUND DEMO FOR SOUNDSCAPES



FRACTAL TONES

WINTER



BREEZE



COMBINATIONS

BLOSSOM



FALL



SUMMER



SPRING



NATURE SOUNDS

SWELLS



SEASIDE



WIDEX SOUNDRELAX DEFAULT SET UP

Default stand-alone:

- 1. WINTER (Fractal)
- 2. BLOSSOM (Combination)

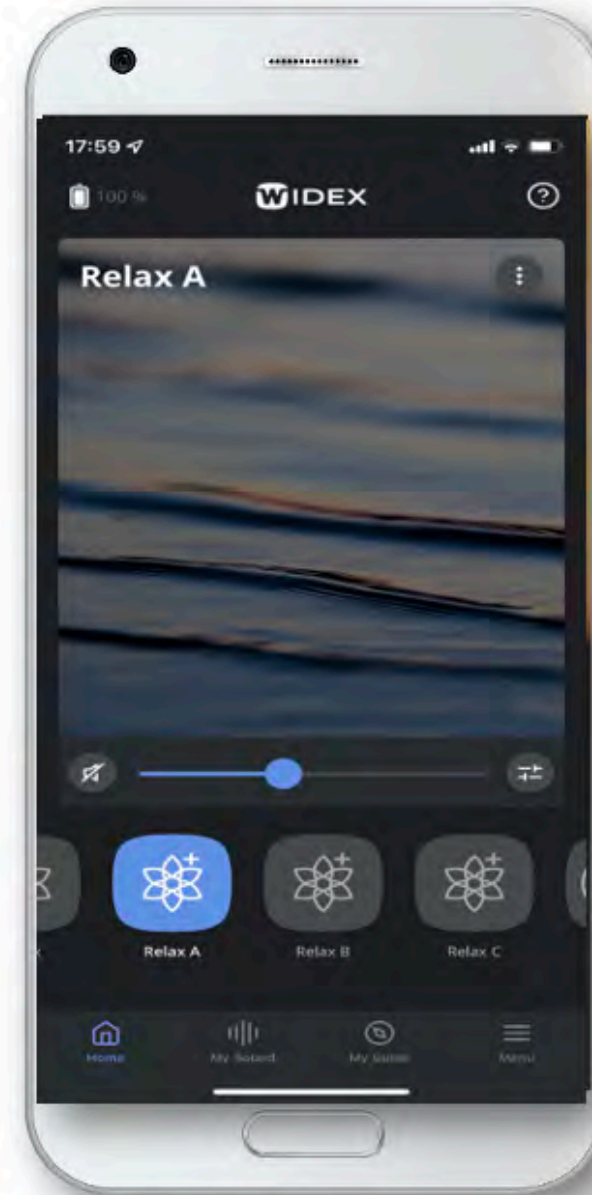
Default Relax+:

- A: BREEZE (Fractal)
- B: AUTUMN (Combination)
- C: SWELLS (Nature)



WIDEX SOUNDRELAX IN MOMENT APP

- Zen styles and SoundRelax styles show in the app as
 - **Relax** A – B – C
 - **Zen** A – B – C
- SmartSpeak message:
 - “Relaxation”
 - “Zen”



AUDIOLOGY CORE STORIES



WIDEX
SOUNDRELAX

SOUNDS FOR WELL-BEING

WELL-BEING

Well-being
Relaxation
Concentration

SOUNDSCAPES

Fractal tones
Modulated Wave-like sounds

PURESOUND

New program base
Sound quality
Attractive to more

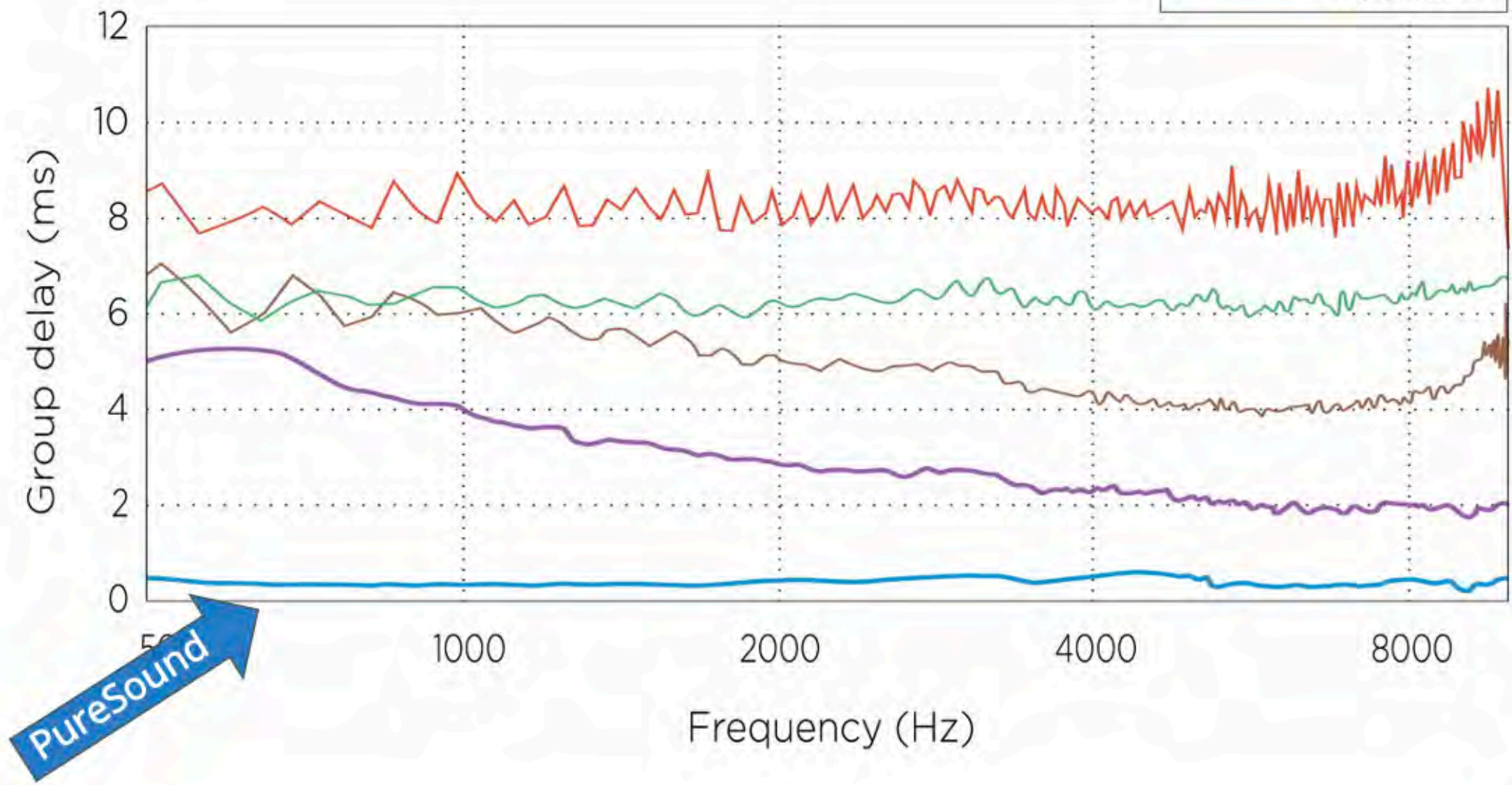
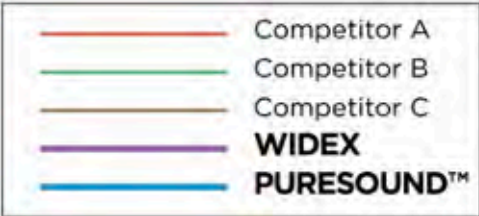


NATURAL SOUND
FEELS RIGHT

WHAT IMPACT DOES DELAY HAVE ON SOUND QUALITY?



THE FASTEST DIGITAL HEARING AID PROCESSING EVER

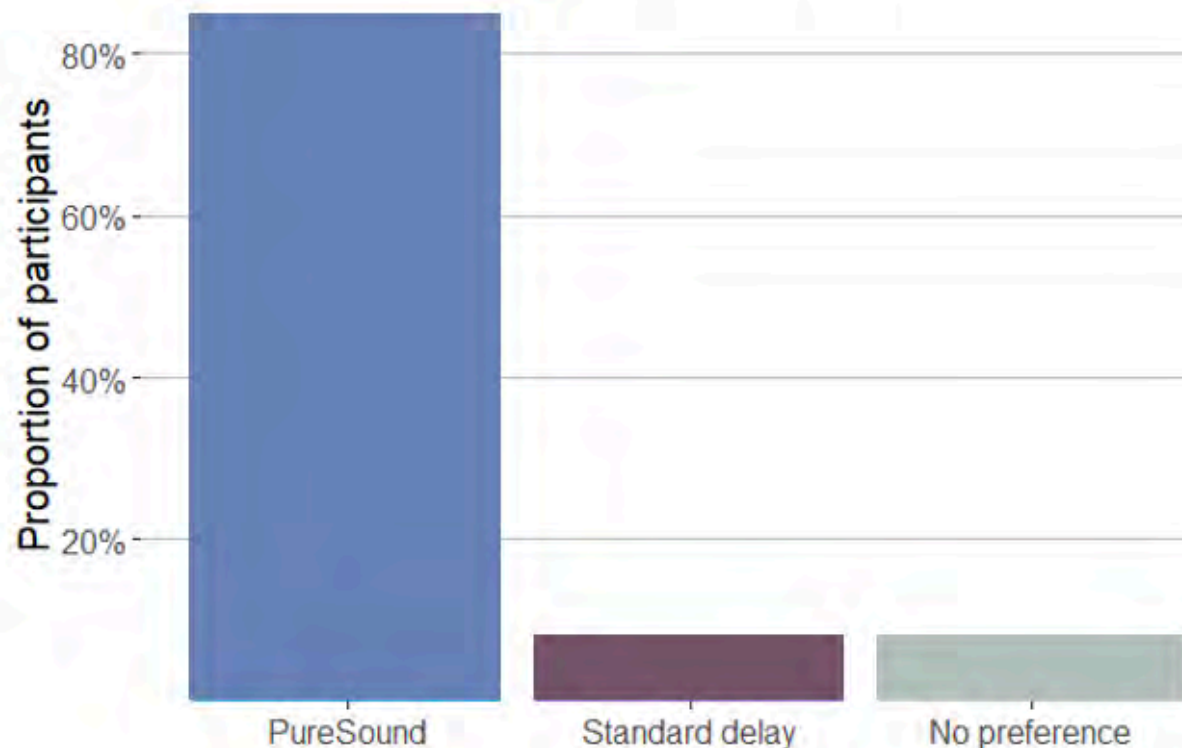


PURESOUND USER PREFERENCES



1. 85% of participants with mild-to-moderate HL prefer **PureSound**
2. 100% of participants with NH prefer **PureSound**
3. Across situations, there were significantly more preferences for **PureSound**
4. In all 20 situations, the majority of preferences were for **PureSound**

Overall sound quality preference

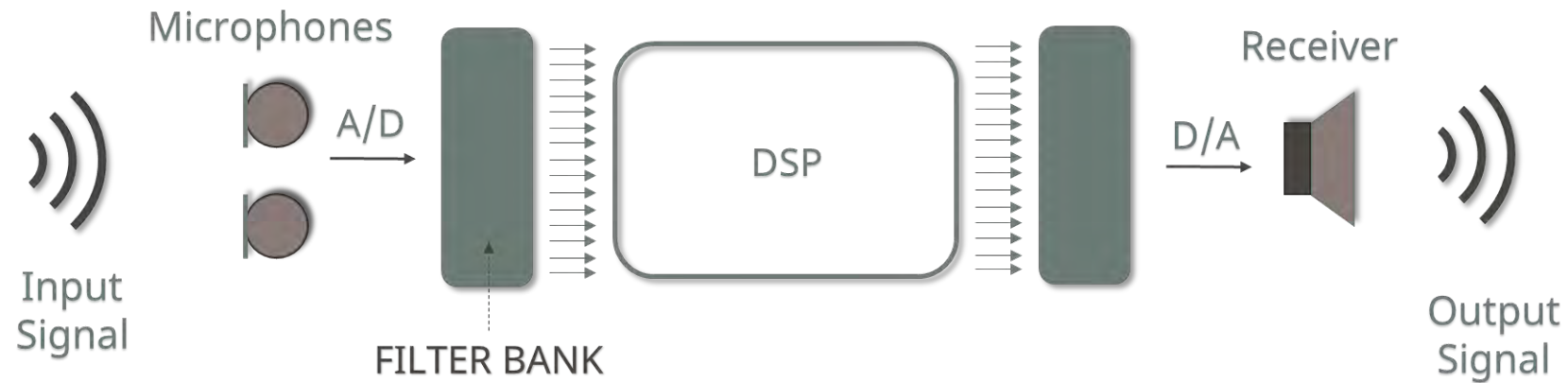


WHY DON'T ALL HEARING AIDS DELIVER LOW DELAY?



One answer is filter bank design...

A filter bank is an array of filters that separate the input signal into multiple components for digital signal processing.



Choices made in filter bank design greatly influence the resulting signal quality.

WHY DOES THE FILTER BANK DESIGN MATTER?



Frequency-Domain Filter Banks



- Forced to make all bands the same size
- The narrow bands result in long delay and low sampling rate



- **Easier for the manufacturer** with less burden for complex computations and easier power management
- **Poorer for the patient** as it introduces the risk of comb filter distortion and limitation on sound quality

Time-Domain Filter Banks



- Flexibility to set different bandwidths
- Supports matching critical hearing bands and allows low delay processing



- **Better for the patient** with processing that matches the ear and preserves the signal as completely as possible for natural sound
- Makes signal processing design harder for the manufacturer, but is **better for natural sound**

PURESOUND PROVEN BENEFITS



Sound quality
preference for
lower delay in
several studies

High satisfaction
in noisy
situations

Sound quality
advantage with
no loss of
speech
intelligibility

For target
group, distortion
is audible for
delays above 1
msec

More natural
sound means
more robust
neural
representation

More natural
sound means
better spatial
perception

Korhonen P, Slugoeki C, Ellis G. Low processing delay preserves natural cues and improves spatial perception in hearing aids. Hearing Review. 2022;29(6):20-25.

Balling LW, Townend O, Helmink D. Sound quality for all: The benefits of ultra-fast signal processing in hearing aids. (2021) Hearing Review, 28(9):32-35

Slugoeki C., Kuk F., Korhonen P., & Ruperto, N. (2020). Neural encoding of the stimulus envelope facilitated by Widex ZeroDelay™ technology. Hearing Review, 27(8), 28–31.

Kuk, F., & Slugoeki, C. (2021). Quantifying Acoustic Distortions from Hearing Aid Group Delays. WidexPress, 44.

Kuk F., Ruperto N., Slugoeki C., & Korhonen P. (2020). Efficacy of Directional Microphones in Open Fittings Under Realistic Signal-to-Noise Ratios Using Widex MOMENT™ Hearing Aids. Hearing Review, 27(6), 20–23.

Balling L.W., Townend O., Stiefenhofer G., & Switalski W. (2020). Reducing hearing aid delay for optimal sound quality: a new paradigm in processing. Hearing Review, 27(4), 20–26.

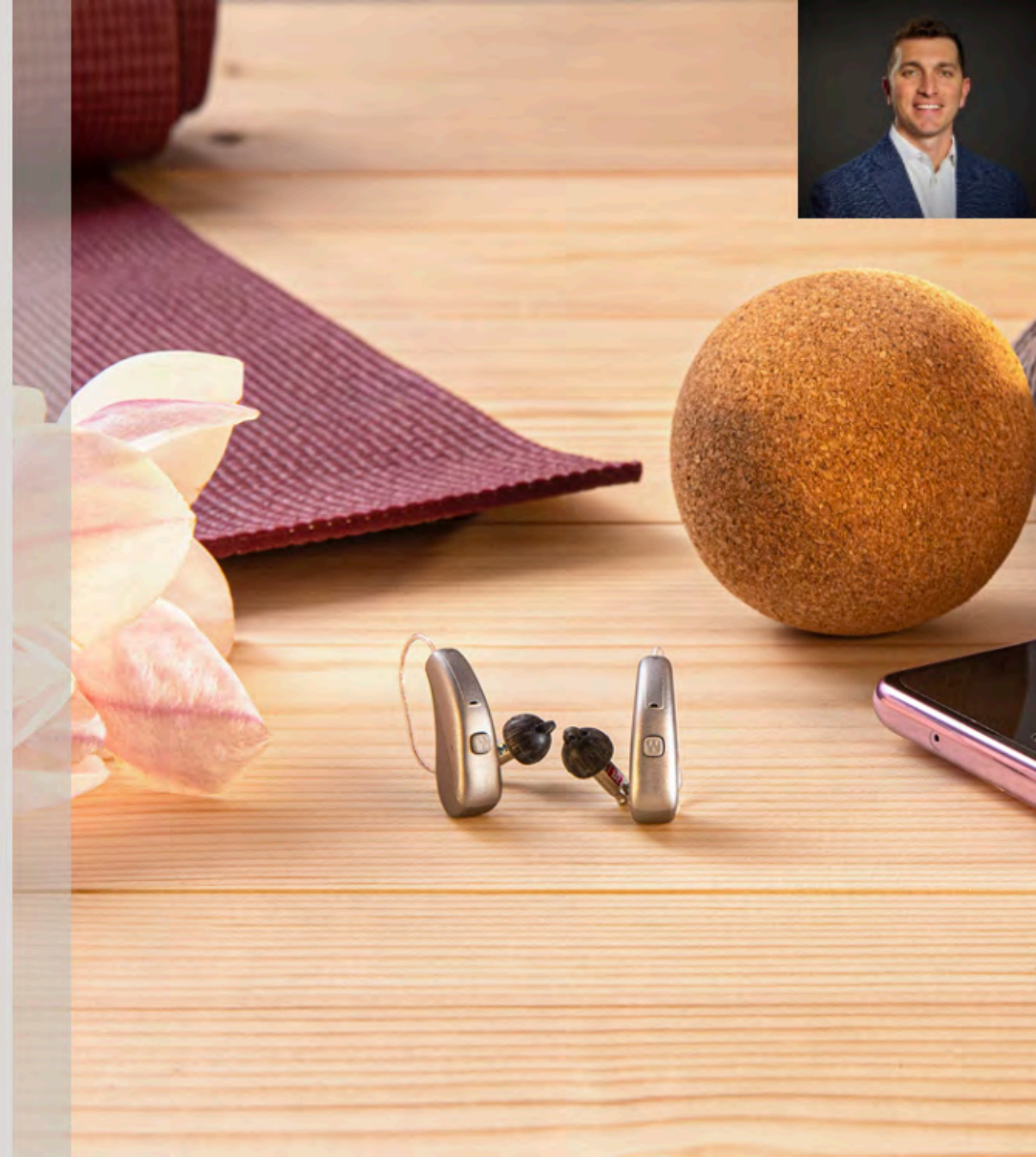


PURESOUND

PureSound as program base for
Zen or SoundRelax

The benefits of ZeroDelay across
programs

Expanding options for tinnitus
management



WIDEX SOUNDRELAX IN COMPASS GPS 4.4



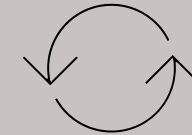
All hearing losses – all-in-one solution



All WIDEX MOMENT performance levels



Updated Fine-tuning and new Program base



Zen options updated

WIDEX SOUNDRELAX IN COMPASS GPS 4.4

- Zen/Relax
- Zen+/Relax+



Available programs

Automatic programs

Universal
PureSound

Additional programs

Quiet
Transport
Urban
Social
Party
Music

Special programs

Impact
Comfort
Zen/Relax
Phone

SmartToggle

Zen+/Relax+

 Program descriptions



WIDEX SOUNDRELAX IN GPS 4.4



WIDEX COMPASS™ GPS 4.4

Test Test | 1/1/2000 (22 years)

END SESSION

SESSION STARTSELECTIONFITTINGFINE TUNINGLOGHANDLING

REMOTE CARE (Sign Up)

Zen+/Relax+

Program manager

FINE TUNING

Tuning

Feature settings

MORE TOOLS

Solution Guide

Adaptation

Audibility Extender

Feedback manager

MPO manager

Verification

WIDEX MOMENT™

Relax - breeze. Not playing

Style selectionOptionsGain and compression

Available Relax styles

winterblossomsummerswells

breezefallspringseaside

Available Zen styles

aquacoralgreenlavender

sandnoisenoise shaped

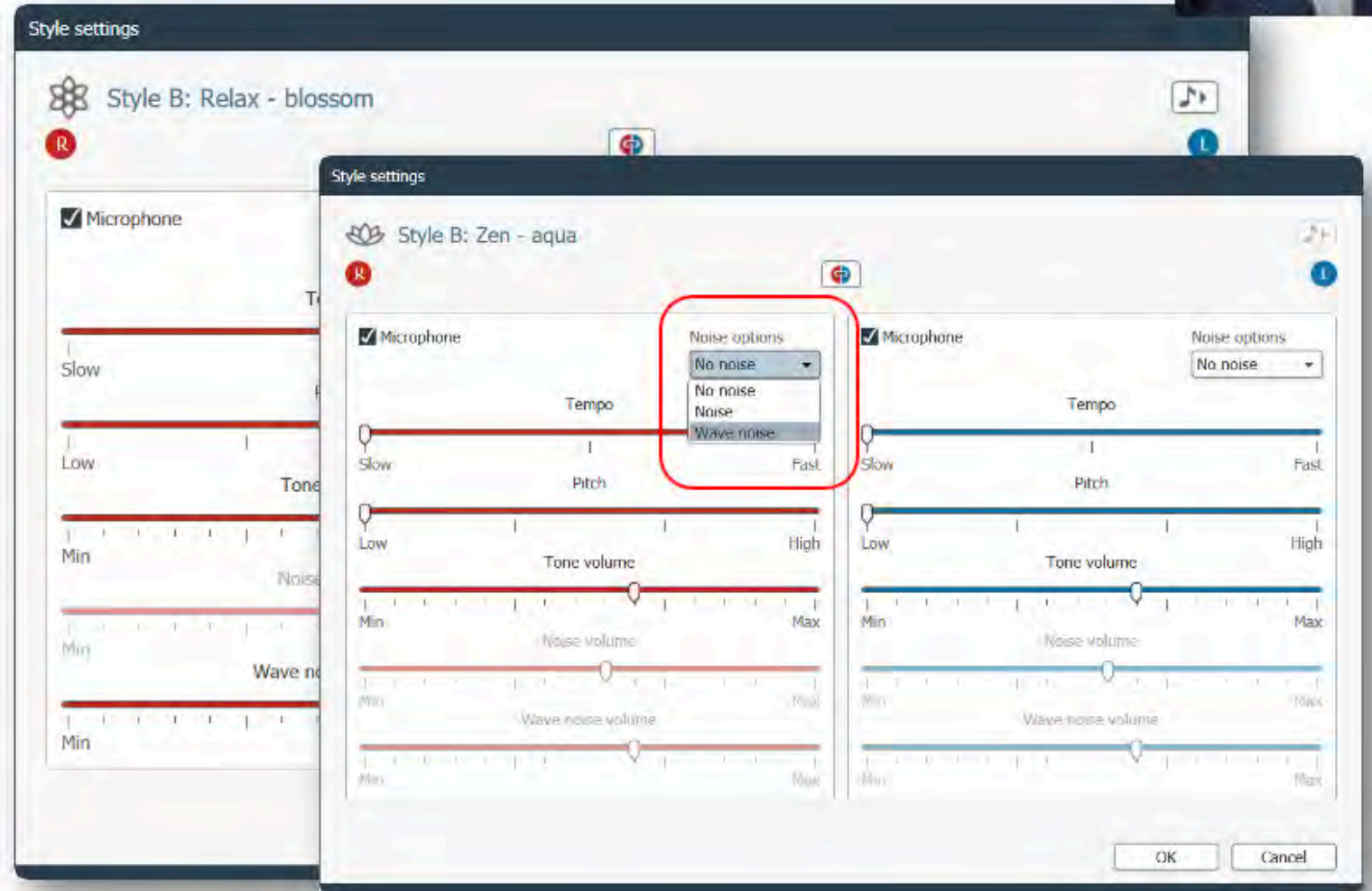
C Relax - swells

Demonstrate styles through loudspeakers

The WIDEX logo, consisting of the word "WIDEX" in a bold, sans-serif font, with a stylized "W" that incorporates a circular element.

STYLE SETTINGS OPTIONS WIDEX SOUNDRELAX

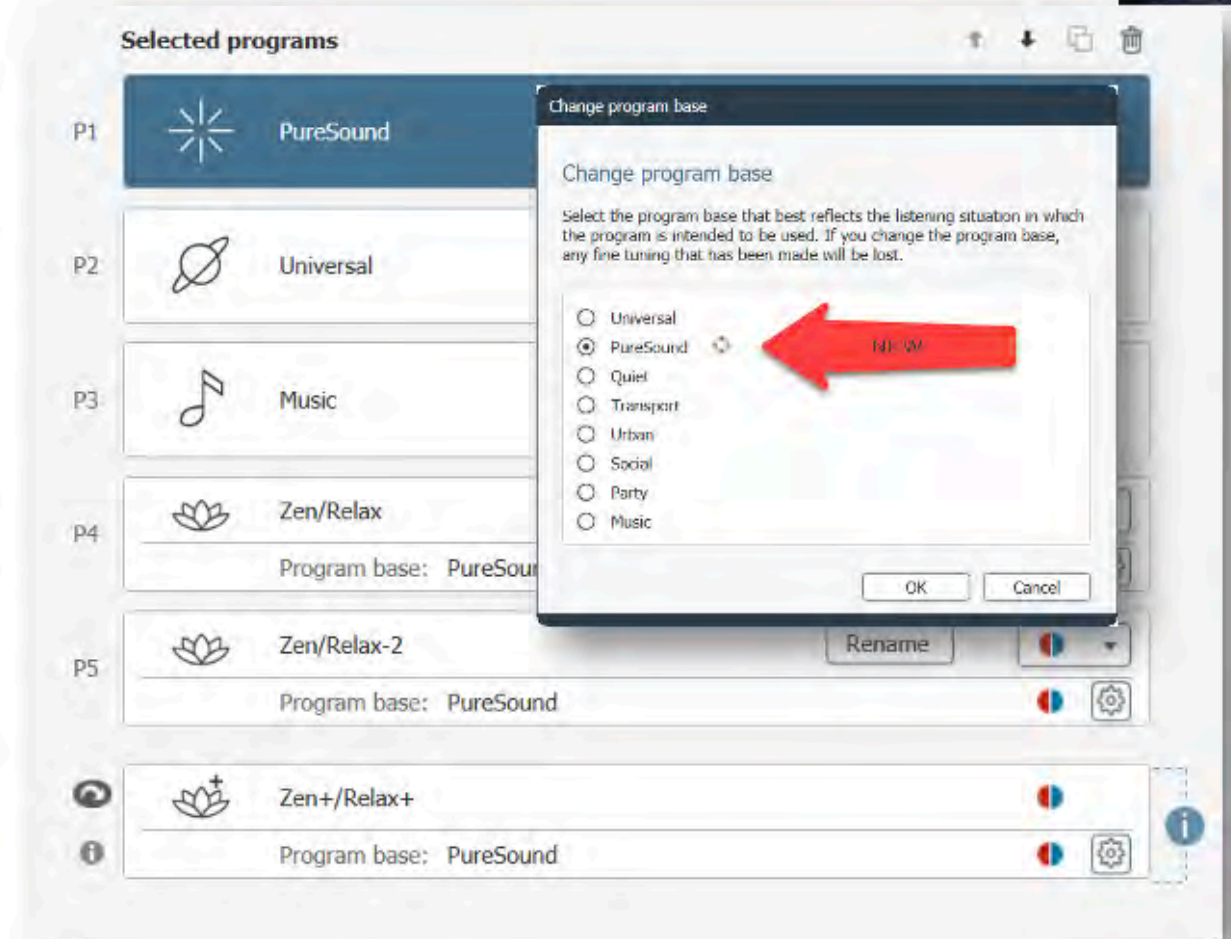
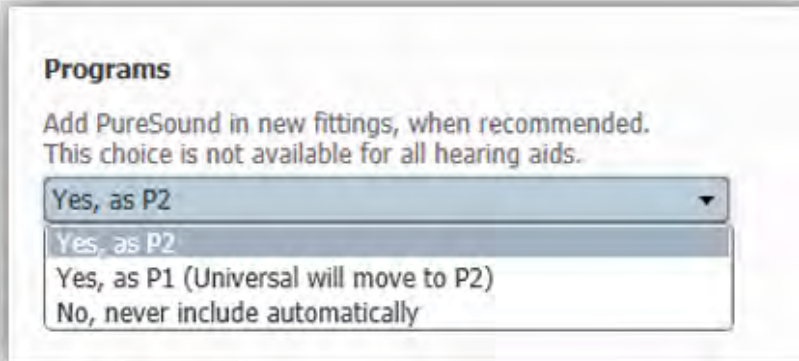
- Microphone on/off
- Noise option
- Tempo
- Pitch
- Tone volume
- Noise volume
- Wave noise volume



WIDEX SOUNDRELAX IN COMPASS GPS 4.4



- Relax or Zen Program base will default to PureSound when the Compass setup is for PureSound to automatically be added and placed in P1
- PureSound can manually be selected as the program base



REMOTE CARE (Sign Up)



Disconnect



Zen+/Relax+

Program manager

FINE TUNING

Tuning

Feature settings

MORE TOOLS

Solution Guide

Adaptation

Audibility Extender

Feedback manager

MPO manager

Verification

R

Zen visualization. Example data



Style selection

Options

Gain and compression

Sound classes



Available Relax styles

breeze

blossom

swells

seaside

autumn

winter

spring

summer



Available Zen styles

aqua

coral

green

lavender

sand

noise

noise shaped

→ A

→ B

→ C

Selected styles



A



breeze



B



blossom



C



aqua

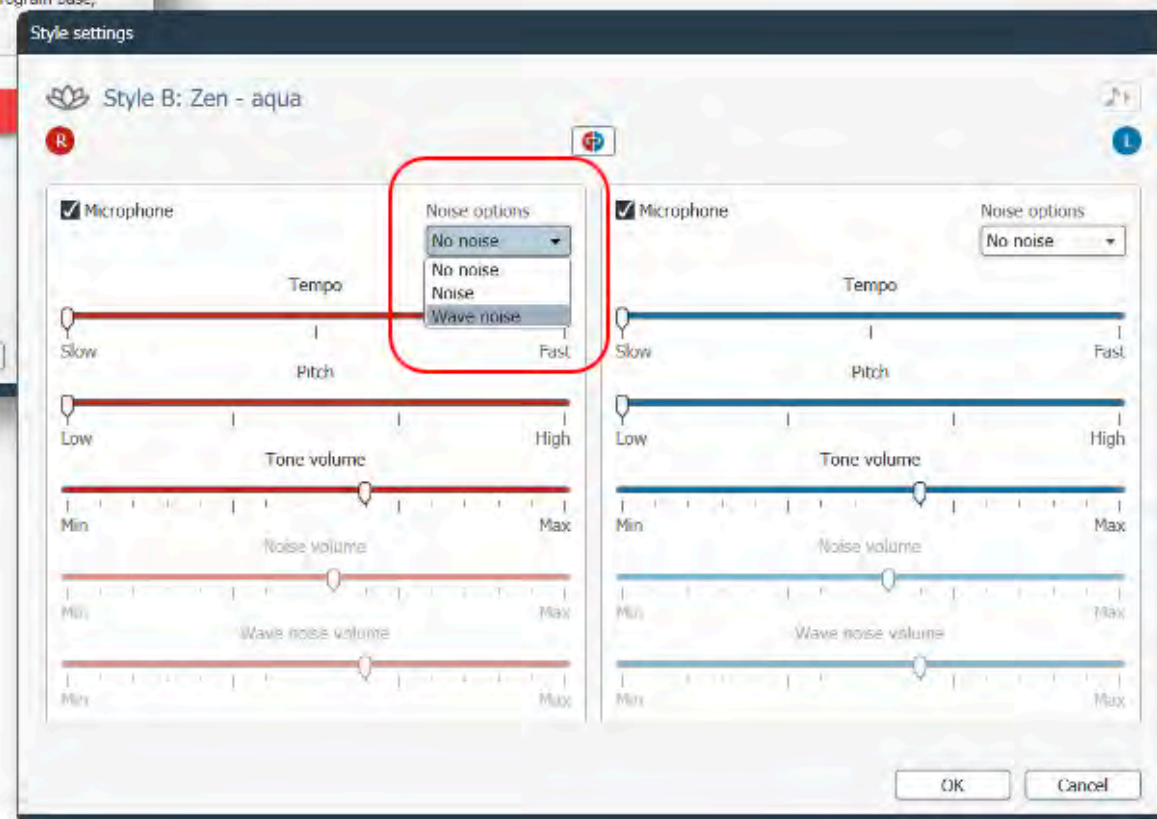
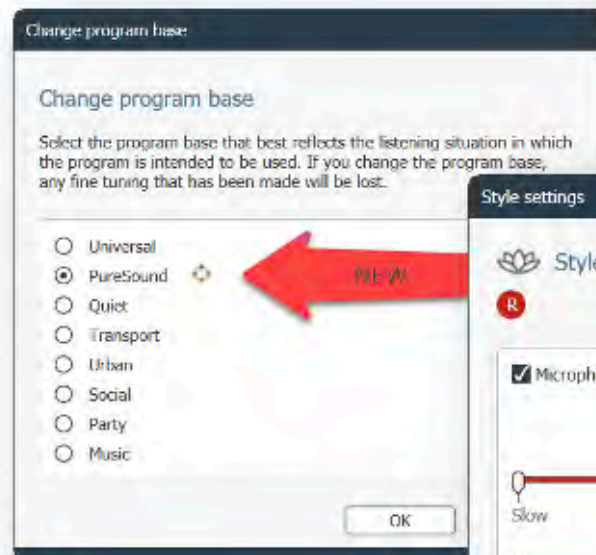


Volume



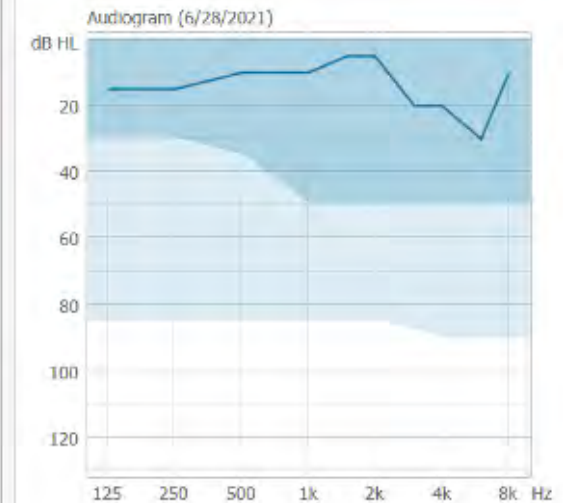
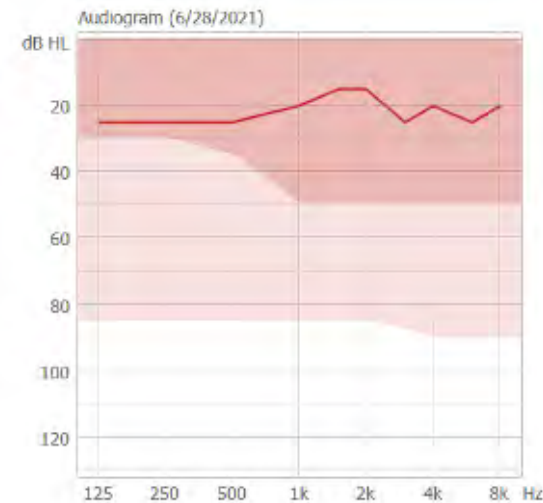
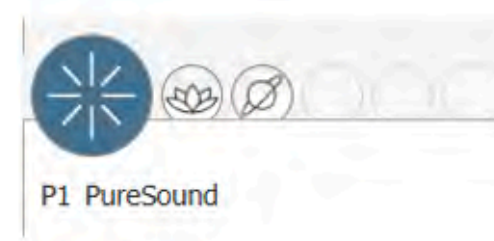
WIDEX ZEN UPDATES

- New program base option
 - **PureSound**
- New noise options
 - **Wave noise**



CASE STUDY

- 58-year-old male
- Essentially normal hearing
- Constant, high-pitch tinnitus, AU
- Already tried other product, was not satisfied with sound or functionality
- At fitting: PS in P1, SoundRelax Fall in P2
- At follow up: Reported he felt the tinnitus was not nearly as noticeable throughout the day. Filled out tinnitus objective measurement. Slightly reduced the wave noise that built in to his SoundRelax program.





WHO WILL THIS BENEFIT?

WIDEX MOMENT SHEER WITH WIDEX SOUNDRELAX



BENEFITS OF WIDEX SOUND RELAX



For the
HCP



For the
end
user

EVIDENCE



The WIDEX logo, featuring a stylized 'W' inside a circle followed by the word 'IDEX' in a bold, sans-serif font.

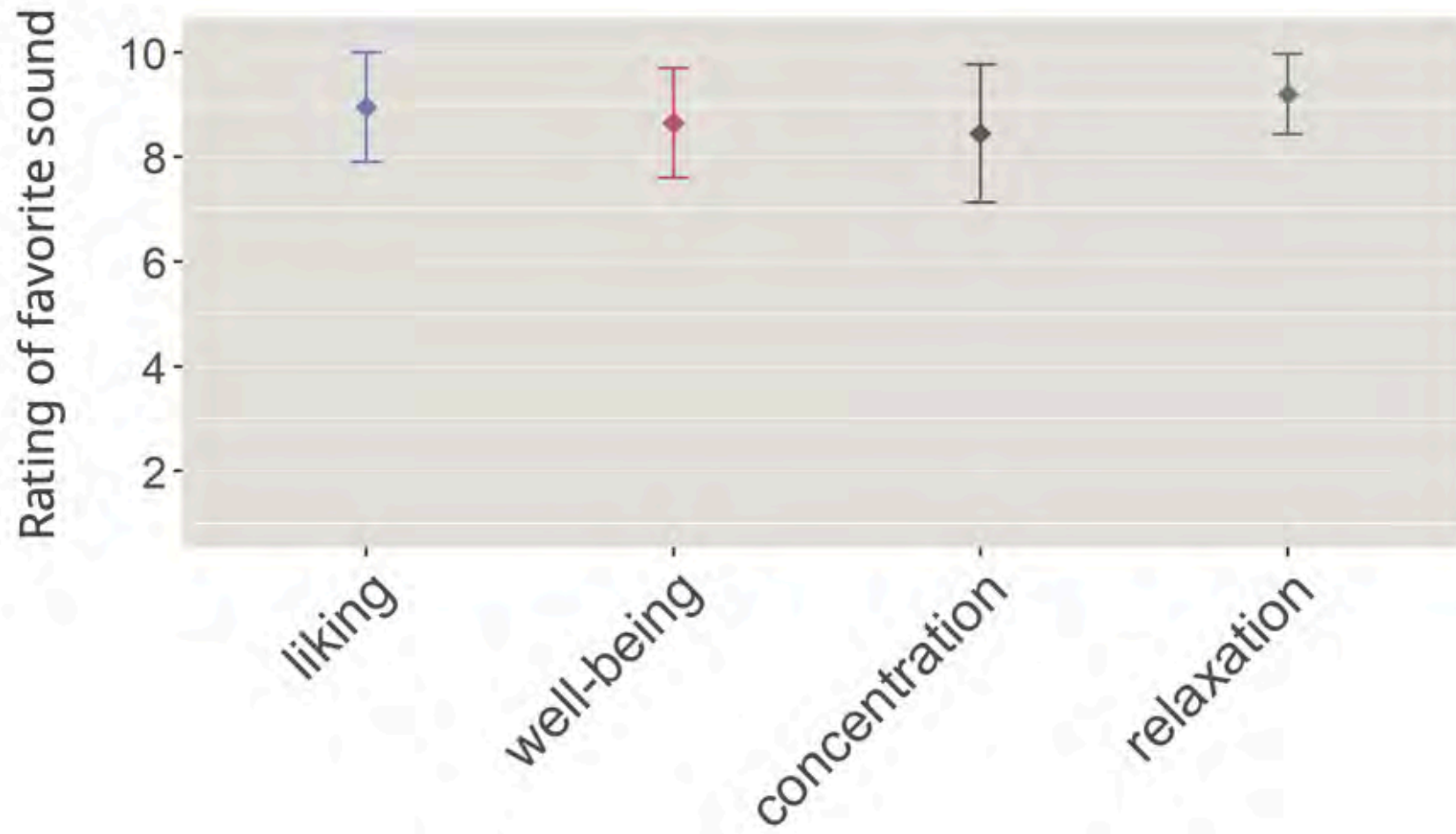
STUDY METHOD



- 20 **participants**, 9 with and 11 without tinnitus
- **Sounds** over headphones
- **Realistic scenario**
 - Each sound listened to at least 10 minutes as background
 - 1-2 sounds a day for a week
 - Ratings immediately after listening
- Focus on **subjective ratings**
 - Liking
 - Well-being
 - Relaxation
 - Concentration



KEY FINDINGS



KEY FINDINGS

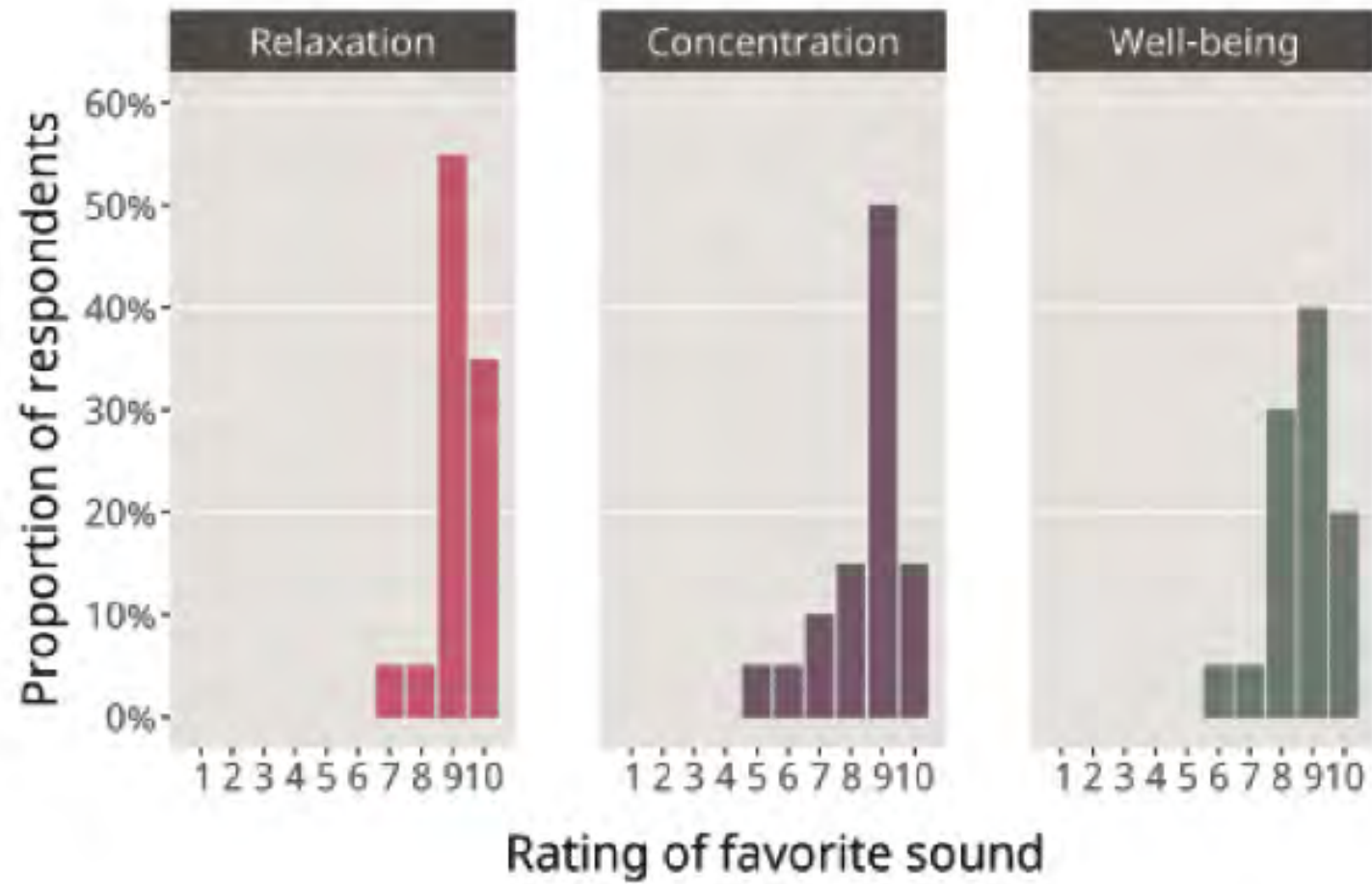
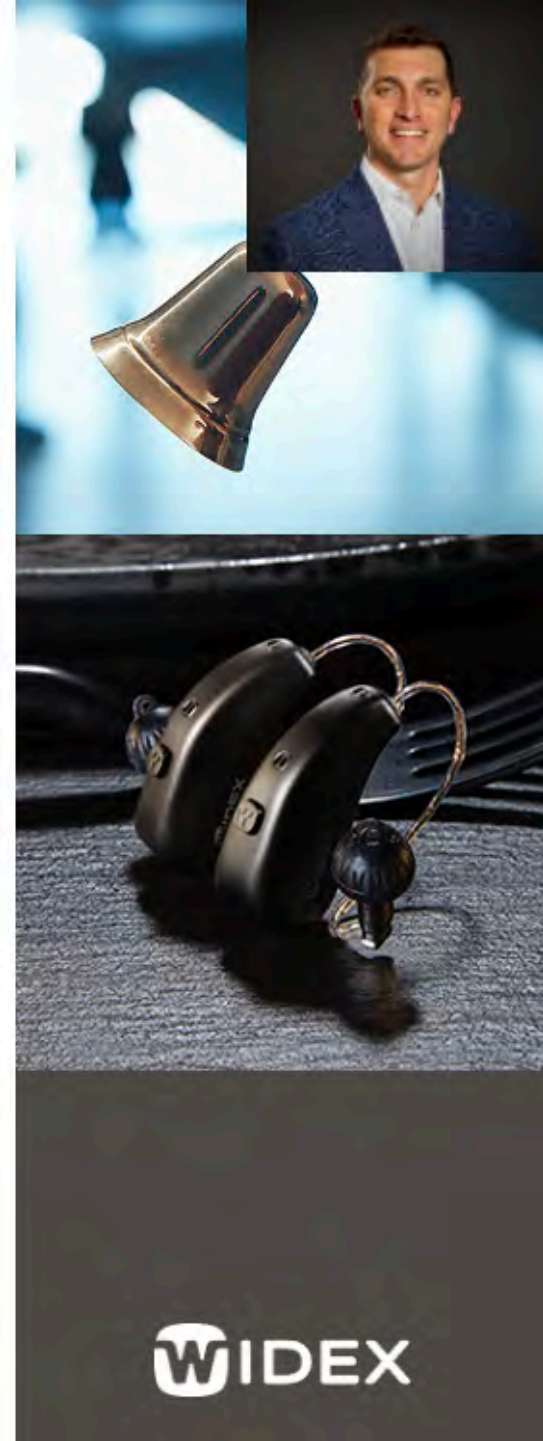


Figure 2: Participants' ratings of whether their favorite sounds support relaxation, concentration, and well-being on 10-point scales, with a response of 1 indicating 'Not at all' and 10 indicating 'Very much.'

EVIDENCE

Zen Evidence may be found in the Evidence Archive at [widexpro.com](https://www.widexpro.com)

- Why and how it works
- How it has evolved
- Widex commitment



OTHER RESULTS

- New sounds liked significantly better than old favorite (and default) Zen Aqua
- Many participants like *soundscapes*: combination of fractal with wave-like sounds
- High correlations between ratings: If you like a sound, also likely to rate it high for relaxation, concentration and well-being.





HEAR BE MAKE
THE DIFFERENCE

Send questions to
AOInquiry@widex.com



SOUND LIKE NO OTHER