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Telehealth and Modern Hearing Conservation

Heather Malyuk, AuD

Heather Malyuk, AuD



Dr. Heather Malyuk, owner of Soundcheck Audiology, is a musician and audiologist who hails from Northeast Ohio, but is known internationally as an expert clinician and public speaker in the field of music audiology. Heather grew up in a musical family and since the age of 2 has been singing, playing piano, violin and fiddle, and guitar. In her early teens, she began teaching music, touring, and recording. She received an undergraduate degree in Music History and Literature from the University of Akron and continued on to earn her Doctor of Audiology (AuD) degree from Kent State University. From 2013-2017, Heather was the clinical director at Sensaphonics Hearing Conservation in Chicago, Illinois. In 2020, she co-authored the clinical consensus document for Audiological Services for Music Industry Personnel through the American Academy of Audiology, she is on the Leadership Advisory Team for the National Hearing Conservation Association, and is a co-chair of the College Music Society's Committee on Musicians' Health. She is passionate about new delivery models for audiologic care and is the Head of Audiology for Tuned, a groundbreaking teleaudiology platform. In addition to her clinical and educational work, Heather developed and manages the first-ever hearing wellness video curriculum for the music industry, is a sought-after consultant, and is active in research with various teams across the country.

Disclosures

- **Presenter Disclosure:** Financial: Heather Malyuk is the owner and director of Soundcheck Audiology. She has received an honorarium for presenting this course. Non-financial: Heather Malyuk has no relevant non-financial relationships to disclose.
- **Content Disclosure:** This learning event does not focus exclusively on any specific product or service.
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Learning Outcomes

After this course, participants will be able to:

- Identify applications for teleaudiology.
- Identify at least 2 aspects of a traditional hearing conservation program.
- Identify 2 primary points of education for individuals who wear headsets for work.

Agenda

- Introduction
- Traditional hearing conservation
- “Hearing conservation” in traditional clinics
- Introduction to modern teleaudiology
- The modern patient population
- Care of the modern workforce
- Other considerations
- Summary

Introduction: My background

- Specialized audiologist for over 10 years
- Private practice owner, Soundcheck Audiology
- Researcher and research advisor
- TED Ed Educator
- MusiCares (Grammys) featured provider
- Wellness Committee co-chair for the College Music Society
- American Academy of Audiology committee for best practices in working with musicians
- Leadership Advisory Team for National Hearing Conservation Association
- Planning committee for the Audio Engineering Society's conference on Music Induced Hearing Disorders

Introduction: Teleaudiology

- Many options for platforms from “Big 5” hearing aid companies to boothless audiometry companies
- I serve as Head of Audiology for Tuned, a virtual audiology clinic

Introduction: The topic

- IRL/URL care
- Taking audiology out of the clinical or industrial box

HEARING CONSERVATION

HEARING LOSS
PREVENTION

HEARING WELLNESS

Traditional Hearing Conservation

- A “regulated” area
- Occupational Safety and Health Administration
- Protects 75% of workers who have significant exposure to noise over the course of their careers
- Legal liability scale

Traditional Hearing Conservation

- Programs must follow OSHA CFR 1910.95
- Many audiologists are familiar with the OSHA scale, which differs from NIOSH

Level (dBA)	85	88	90	91	94	95	97	100
OSHA	16 hr	--	8 hr	--	--	4 hr	--	2 hr
NIOSH	8 hr	4 hr	--	2 hr	1 hr	--	30 min	15 min

Traditional Hearing Conservation

- The purpose is prevention of Noise-Induced Hearing loss (NIHL)
- The hope is to also prevent other hearing disorders caused by sound exposure:
 - Tinnitus
 - Decreased sound tolerance
 - Cochlear synaptopathy

Traditional Hearing Conservation

OSHA CFR 1910.95 has 7 parts

1. Monitoring of employee noise exposures,
2. The institution of engineering, work practice, and administrative controls for excessive noise,
3. The provision of each overexposed employee with an individually fitted hearing protector with an adequate noise reduction rating,
4. Employee training and education regarding noise hazards and protection measures,
5. Baseline and annual audiometry,
6. Procedures for preventing further occupational hearing loss by an employee whenever such an event has been identified.
7. Recording Keeping

Traditional Hearing Conservation

- I would argue that most of the components of OSHA CFR 1910.95 could be completed with individual clinical patients

Hearing Conservation In Traditional Clinics

- Audiologists work in unregulated hearing conservation
 - Musicians/concert goers
 - Firearm users
 - Anyone exposed to loud sound
- This type of clinical encounter usually occurs due to a patient wanting a product such as custom earplugs

Hearing Conservation In Traditional Clinics

- Many clinical audiologists who want to expand into non-regulated conservation will:
 - Pass out earplugs at health fairs
 - Attend trade shows to take ear impressions for custom earplugs
 - See musicians for ear impressions for in-ear monitors
- We must do more as this work is essential

Hearing Conservation in Traditional Clinics

- A survey study of audiologists who work in “hearing conservation” with musicians
- Based on a previous Australian study by McGinnity and colleagues
- Our take: Did CEUs change behaviors?

Completed Procedure	No CEUs obtained (N=17)	Noise/Hearing conservation CEUs obtained (N=54)	Musician Specific CEUs Obtained (N=37)
Otoscopy	88%	98%	100%
Tympanometry	35%	57%	62%
Acoustic Reflex	24%	31%	35%
Otoacoustic Emissions	18%	41%	49%
Pure Tone Audiometry	41%	78%	86%
Extended High Frequency Audiometry	12%	39%	51%
Speech Recognition Threshold	35%	56%	59%
Word Recognition Score	41%	61%	65%
Speech-In-Noise Testing	18%	28%	35%
Loudness Discomfort Level	12%	22%	24%
Case History	94%	89%	92%
Counseling	88%	94%	92%
Education	65%	94%	97%

Hearing Conservation In Traditional Clinics

Surveyed audiologists who advertised musician-specific services related to in-ear monitors

- N was 400 AuDs (~4% of full-time audiologists, but we estimate that at least 30% or more take ear impressions for IEMs even though that specific service isn't advertised).
- These individuals indicated that they are seeing at least 90 music industry professionals per year for IEMs.

Hearing Conservation In Traditional Clinics

- Over **50%** don't routinely offer education or care during such an appointment
- Over **90%** either considered IEMs to be a safety device or were unsure, with over **50%** believing that IEMs might have output limiters.
- Over **90%** didn't refer any of these patients to a specialized Music Audiologist.
- Over **75%** did no verification or follow-up
- Over **72%** reported confidence in working with musicians with **60%** feeling that they needed more training

Hearing Conservation in Traditional Clinics

- Patients can now be reached by tele-audiology for education, follow-up care, and more

Intro to Teleaudiology

- A branch of Telehealth
 - The Lancet published about telehealth as early as 1879, stating that telephone calls could be used to reduce unnecessary office visits
 - Use of telemedicine didn't begin until the 1950s
 - “Teleaudiology” coined in the 1990s

Intro to Teleaudiology

- Globally, **430 million** individuals live with hearing loss that affects their quality of life
- By 2050, it is estimated to increase to **700 million**
- It is thought that much of this can be mitigated with hearing loss prevention measures.
- In the USA, more than 50% of counties do NOT have an audiologist

Intro to Teleaudiology

- “Teleaudiology will continue to be a promising tool for promoting relatedness and positive user experience, confidence and capability, and appropriate levels of autonomy for the user to choose from among the **person-centered care** options available.” (Brice & Almond, 2022)
- To date, there is limited research into all areas of teleaudiology

Intro to Teleaudiology

Ross, F., Wohllebe, A., & Diez, E. (2022). The Role of Personal Assistance in the Uptake of Smartphone-Based Tele-Audiology--An Extension of the Technology Acceptance Model. *International Journal of Interactive Mobile Technologies*, 16(12).

- Focused on individuals above the age of 65, their use of technology, and how teleaudiology fits into **hearing aid** models and use of smart phones with hearing aids.

Kokkonen, J., Kaski, H., Mäkinen, S., & Svärd, F. (2022). Remote **hearing aid** renewal using pre-existing audiograms during the covid-19 pandemic. *International Journal of Audiology*, 1-8.

Ebrahimi-Madiseh, A. (2022). Telehealth experiences and preferences of adults with **hearing loss**. *International Journal of Audiology*.

Intro to Teleaudiology

- American Academy of Audiology Teleaudiology Position Statement
 - “The full scope of audiological services should be considered for delivery via telehealth, including services associated with the screening, assessment, and treatment of hearing loss and auditory system disorders; the delivery, follow-up, and monitoring of hearing devices; assessment and treatment of vestibular and balance disorders; consultations with other health-care professionals; and remote service delivery.”

Intro to Teleaudiology

- Telehealth has plateaued at 38x higher use than pre-pandemic
- Especially lending itself to a specialist model (like audiology!)

Intro to Teleaudiology

- “The benefits of teleaudiology are numerous. ...Given the provider shortages throughout the world in both rural and urban areas, it has a unique capability to increase service to millions of patients who otherwise might not receive qualified hearing care...”
- “...Therefore, we can conclude that the systematic review supports the use of teleaudiology for hearing care professionals and **clients with hearing loss.**”

The Modern Patient Population

- Everyone.
- Let's focus on a subset: the workforce

Survey Study

New research:

353 workers

20–65 old

28% identified as “non-white”

Variety of job titles and salary ranges

Spanned the entirety of the USA

80% employed full-time basis

All remote or hybrid

83% receive health benefits from their employer

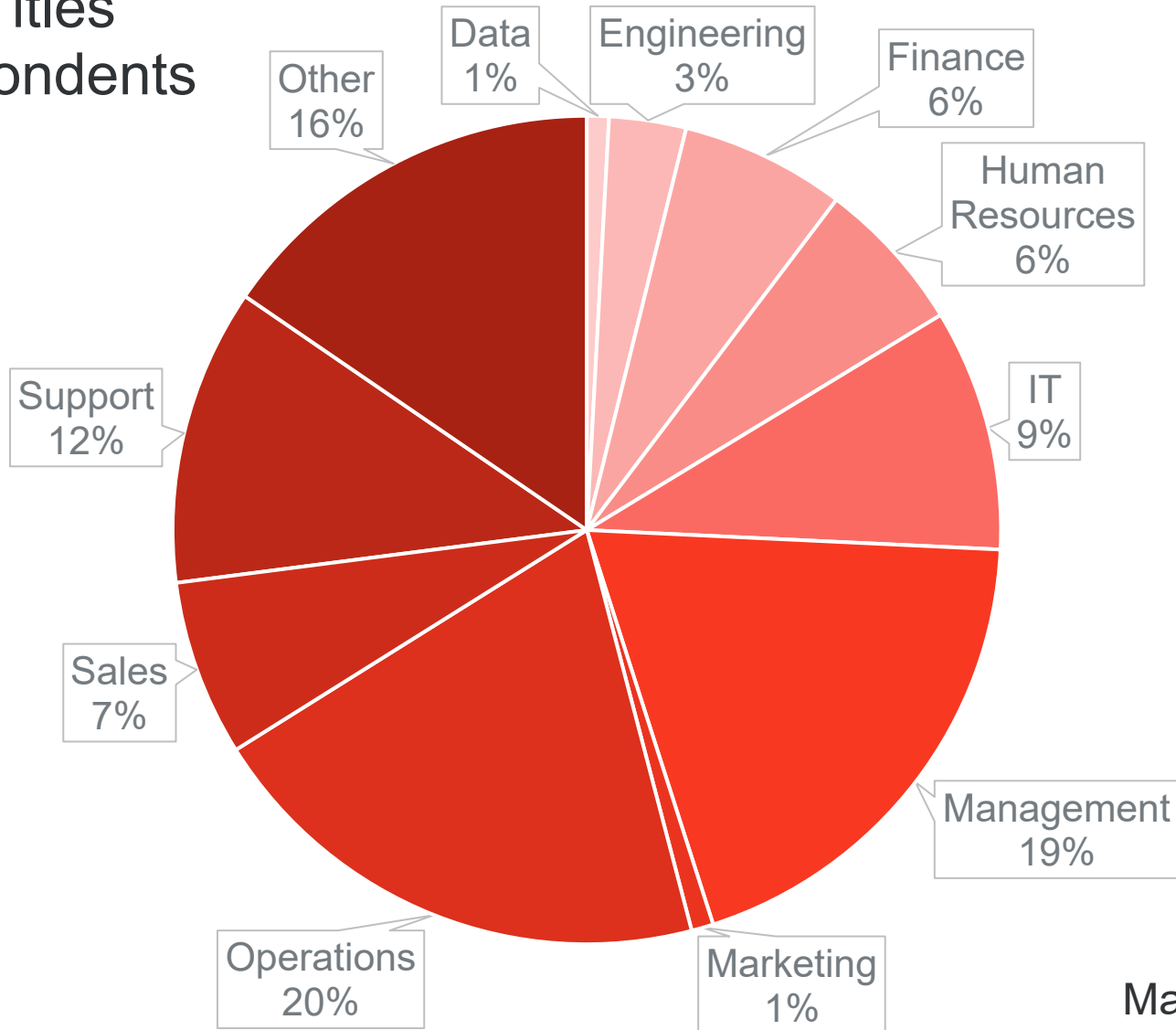
46% of those receive hearing benefits

Total: **233**

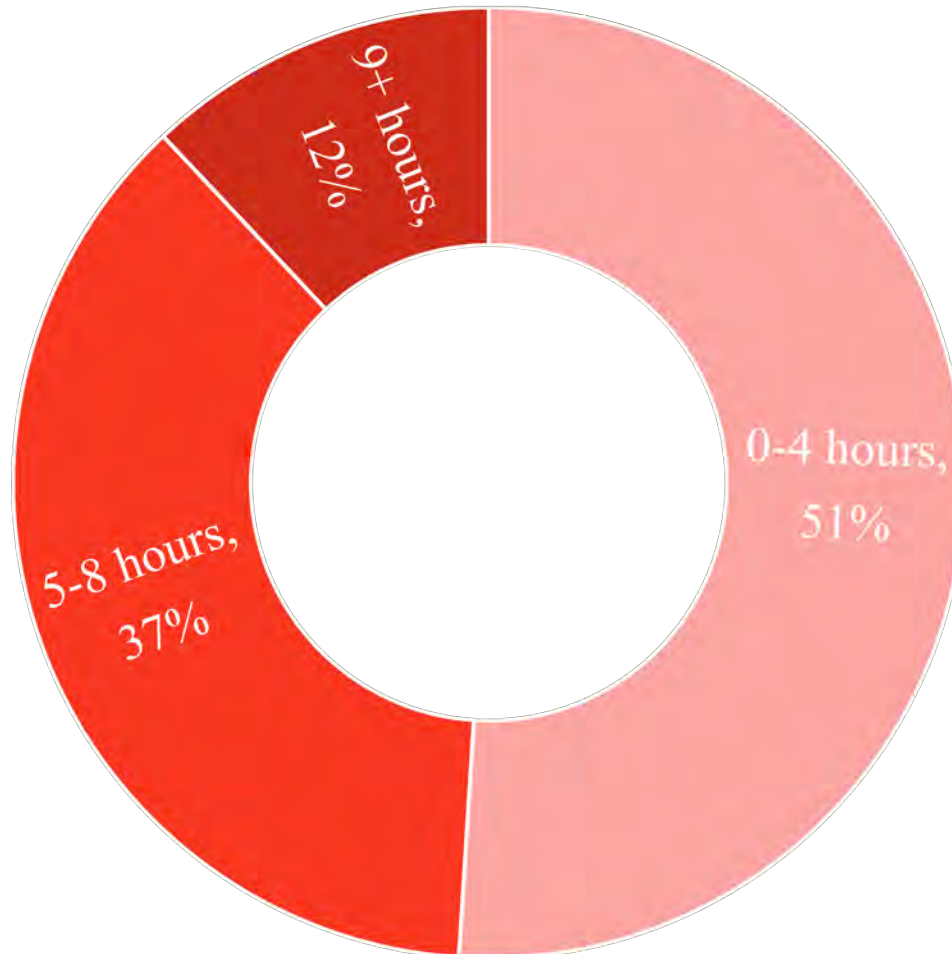
Surveyed to determine access to hearing health via their employer and their own hearing experiences

Malyuk, 2022

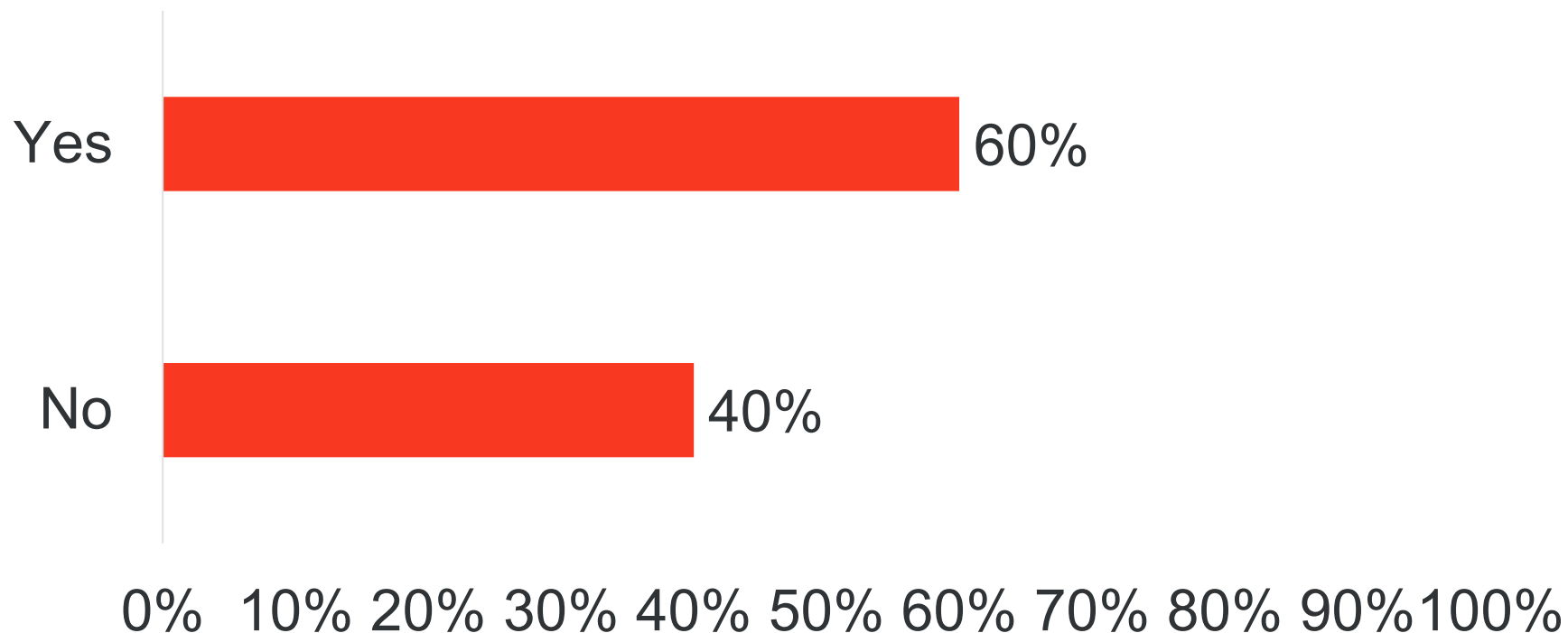
Job Titles of Respondents



Estimated hours of earbuds/headphones/headsets per day



Presence of listening fatigue at end of work day



52% admitted to additional breaks throughout the day due to listening fatigue

49% report more than 5 hours of ear level devices per day for work-related use

43% disclosed having tinnitus

26% disclosed increased tinnitus and perceived hearing issues since the pandemic (remote work)

Risks

- Temporary Threshold Shift
- Noise-Induced Hearing Loss
- Hidden Hearing Loss?
- Tinnitus
- Other auditory disorders

Care of the Modern Workforce

- Non-regulated hearing conservation
- Teleaudiology as a benefit?
 - Several teleaudiology companies now doing just that
- Large companies are offering annual screenings and even devices as a benefit

Care of the Modern Workforce

- Primarily hearing conservation with the younger workforce
- Wanting to prevent tinnitus and hearing loss
- Many mentioning difficulty understanding speech in background noise
- Average patient age: 34

Care of The Modern Workforce

Imagine you see a 30 year old woman experiencing listening fatigue. She has a teleaudiology benefit. What can you do?

Education/counseling

Screening

Recommendations

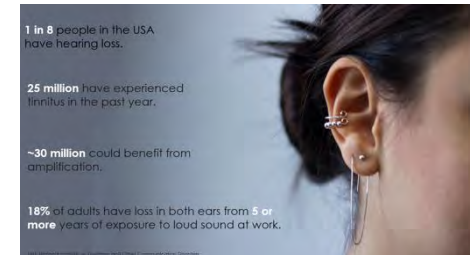
Follow-up care



A Modern Worker



Education



Care of the Modern Workforce

- A hearing screening can consist of an intake form, validated questionnaires, pure tones, Digits-In-Noise test, and more...
- Be CAREFUL with interpreting findings and discussing
 - Do not mislead any patient to believe this is a diagnostic test like what they would get in-person
- If any red flags are present, REFER

Care Of The Modern Workforce

- This patient's screenings were highly suggestive of normal hearing
- She needs something to help with clarity while working
- What would a traditional clinic recommend?
- Is this hearing conservation?

Care Of The Modern Workforce

- The recommendations (from me) were as follows:
 1. Try to see an audiologist annually for a hearing test, or at least establish a baseline diagnostic test somewhere
 2. New headphones
 3. Sonic Cloud software

Care Of The Modern Workforce

- Result:
 - Life changed
- Question: Does she “deserve” care if she doesn’t have a diagnostic test completed?

Care of The Modern Workforce

Imagine you see a 48 year old man who...

- Works at a small office and wears earbuds all day listening to Spotify
- States that the volume is usually at 95%-ish for “clarity”
- Works 9 hour days, using the earbuds ~8 hours
- Not listening to earbuds all day is “out of the question”
- “I don’t want to hurt myself.”

Care Of The Modern Workforce

- Diagnostic test completed 2 months prior, uploaded by him
- Decided to try his employee benefit as the audiologist told him his hearing is WNL
- Recommendation was to follow-up in a year, but no other recommendations or information given
- “I don’t want to wait to find out I have hearing loss when I read online hearing loss can be prevented.”

Care Of The Modern Workforce

- Discussion of signal to noise ratio in relation to earphone/headphones isolation and office
- Discussion of binaural summation and questions about wearing both earbuds
- Instructions on using EQ functions on Spotify

Care Of The Modern Workforce

- Results:
 - Empowered and confident about caring for his hearing
 - Reduced volume to about 60%

Other Considerations

- Limitations of teleaudiology
 - Screening vs diagnostic testing (can do remotely)
 - Transducer issues
 - What does “validated” mean?
 - Basics like otoscopy (can do remotely)
 - Asking questions about being seen previously by other health care providers

Other Considerations

- The role of educator, counselor, consultant
 - Limitations of audiologist's desires

Summary

- Audiologic care is for **EVERYONE**
- Teleaudiology is reaching people who we might otherwise not see
- While teleaudiology has many applications, non-regulated hearing conservation is a gap that is ready to be filled

Thank you!

Heather Malyuk, AuD



References

- American Academy of Audiology. (2021) The Use of Telehealth for the Delivery of Audiological Services.
- Bashshur R, Shannon GW. History of Telemedicine: Evolution, Context, Transformation (Vol. 2009). New Rochelle, NY: Mary Ann Liebert; (2009)
- Board on Health Care Services; Institute of Medicine. The Role of Telehealth in an Evolving Health Care Environment: Workshop Summary. Washington (DC): National Academies Press (US); 2012 Nov 20. 3, The Evolution of Telehealth: Where Have We Been and Where Are We Going? Available from: <https://www.ncbi.nlm.nih.gov/books/NBK207141>
- Brice, S., & Almond, H. (2022). Is Teleaudiology Achieving Person-Centered Care: A Review. International Journal of Environmental Research and Public Health, 19(12), 7436.
- Chadha, S., Kamenov, K., & Cieza, A. (2021). The world report on hearing, 2021. Bulletin of the World Health Organization, 99(4), 242.

References

- Ideker, K., Sears, A., Malyuk, H., McGinnity, S., Le Prell, C. (2021). Self-Reported Clinical Practices in Musician-Centered Hearing Health Care. Unpublished manuscript.
- Kim, J., Jeon, S., Kim, D., & Shin, Y. (2021). A review of contemporary teleaudiology: literature review, technology, and considerations for practicing. *Journal of audiology & otology*, 25(1), 1.
- Malyuk, H. (2022) Remote and Hybrid Workers in the White-Collar Sector: New Data Highlights the Modern Workplace's Toll on Hearing. *Spectrum*. 39(3) 16-17.
- Meibos, A. & Malyuk, H. Facilitating Custom In-Ear Monitors: A Cross-Sectional Survey. Unpublished manuscript.

References

- Ross, F., Wohllebe, A., & Diez, E. (2022). The Role of Personal Assistance in the Uptake of Smartphone-Based Tele-Audiology--An Extension of the Technology Acceptance Model. *International Journal of Interactive Mobile Technologies*, 16(12).
- Victory, J. (February 3, 2021) Need an audiologist but can't travel? Telehealth may be an option. *Healthy Hearing*.
<https://www.healthyhearing.com/report/52986-Need-an-audiologist-but-can-t-travel-telehealth-may-be-an-option>