

Hearing Wellness For The Collegiate Musician



UNIVERSITY OF
MICHIGAN

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Disclosures

- Allie Heckman receives a salary from Michigan Medicine.
- We have no other disclosures to report.

Objectives

- Introduction to the collaborative effort of the UM School of Music Theatre & Dance (SMTD) Wellness Initiative
- Discussion of the core components of our hearing conservation program
- Review results of our hearing conservation efforts
- What is the role of the audiologist?
- Discussion of future directions

Hearing Conservationist Definition

Consider this definition of a hearing conservationist:

“An individual who focuses on the prevention of auditory disorders as a result of potentially hazardous exposure.”

Who considers themselves to be a hearing conservationist?



Wellness for the Performing Collegiate Artist

- The Wellness Initiative includes team members representing the following specialties:
 - Audiology, Laryngology, Speech-Language Pathology (from MI Medicine Otolaryngology)
 - Counseling and psychology
 - Physical Therapy
 - Athletic Training
 - Occupational therapy



SMTD Wellness Initiative: A Collaborative Effort



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“The Artist is an Athlete”

- Is a student musician an “athlete” when it comes to hearing health?
- Music Induced Hearing Disorders (MIHDs) include hearing changes, tinnitus, hyperacusis, and sound distortion.
- Students can experience quality of life changes and danger to their performance ability

SMTD 2019 symposium for students, faculty, and healthcare professionals in the community



Transtheoretical Model Health Behavioral Change

- Includes:
 - Precontemplation → Contemplation → Action → Maintenance
- How can we help student musicians through this process?
- Gilliver & Beach (2021) discuss how this model applies to hearing conservation in young adults.



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umichsmtd The Wellness Initiative is so thankful for our Michigan Audiology colleagues and the Wayne State audiology students for providing free hearing screenings to our students, staff, and faculty here at SMTD last Friday!

[#WellnessWednesday](#) [#michigan](#) [#audiology](#) [#WayneState](#)

Hearing Screenings began in 2018

Currently includes

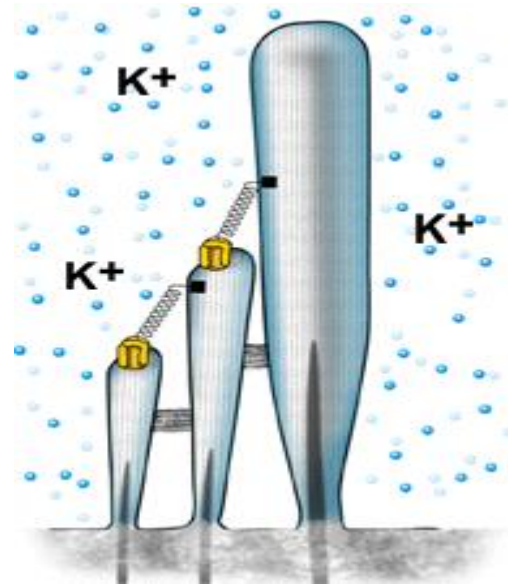
- Hearing Health Questionnaire
- Otoscopy
- Pure tone screening at 1000, 2000, 3000, and 4000 Hz
- DP otoacoustic emissions
- Counseling regarding results with the opportunity to ask questions related to their sound exposures, earplugs, etc.

Hearing Health Questionnaire

- Music students are asked to provide:
 - Various demographic information
 - Symptoms of MIHDs
 - Complete THI if they experience tinnitus
 - Musical sound exposures including:
 - Time duration, rehearsal environment, performance environment
 - If they teach applied lessons
 - Recreational/occupational sound exposures
 - Including headphone use
 - Earplug use

Use of DPOAEs in Screening Setting

- As indirect measure of “cochlear health” could DPOAEs serve as a useful indicator of high-risk or overexposure for select student?
 - Concern for hearing difficulty despite passing puretone screening?
 - Concern for acoustic trauma due to experience of tinnitus?
- Could measures be “overly sensitive” or just right for students in loud music settings?



Counseling Students on Results and Recommendations

- Discussion of screening results
 - Pass/refer for puretone and DPOAE screening
- Opportunity for questions regarding sound exposures, prevention methods, types of earplugs
- Discuss further follow-up options, such as a comprehensive audiology exam
 - How to pursue this (Example: obtaining order for audiology testing)

Collaboration with AuD Students

- Introduction to clinical applications for hearing conservation and music audiology
- Facilitating screening events
- Identifying “at risk” based on screening results
- Helps Audiology trainees add certain skill set components such as
 - otoscopy
 - DPOAE testing
 - Earplug fitting and verification including:
 - Non-directive counseling
 - Use of technology tools such as smartphone applications for volume limits and sound level awareness
 - Networking with experienced providers that may lead to door opening opportunities



Musicians' Hearing Conservation-Establishing Preventative Measures at the Collegiate Level Through a Partnership Model (Nov, 2021)

Authors: Paola Savvidou, Allie Heckman, Annie Jeng, Samantha Kesteloot, Bruce Edwards

Targeted audience: music teachers, administrators



Selected results of pilot study (2018-2019)

- 9 (9.6%) of participants referred on pure tone screening
 - 8/9 referred at > 1kHz
- Average age referring on pure tone screening was 45 years
- Average age of tinnitus reporters was 27 years of age
 - 31 of 52 (~60%) participants who answered tinnitus questions in the hearing health questionnaire

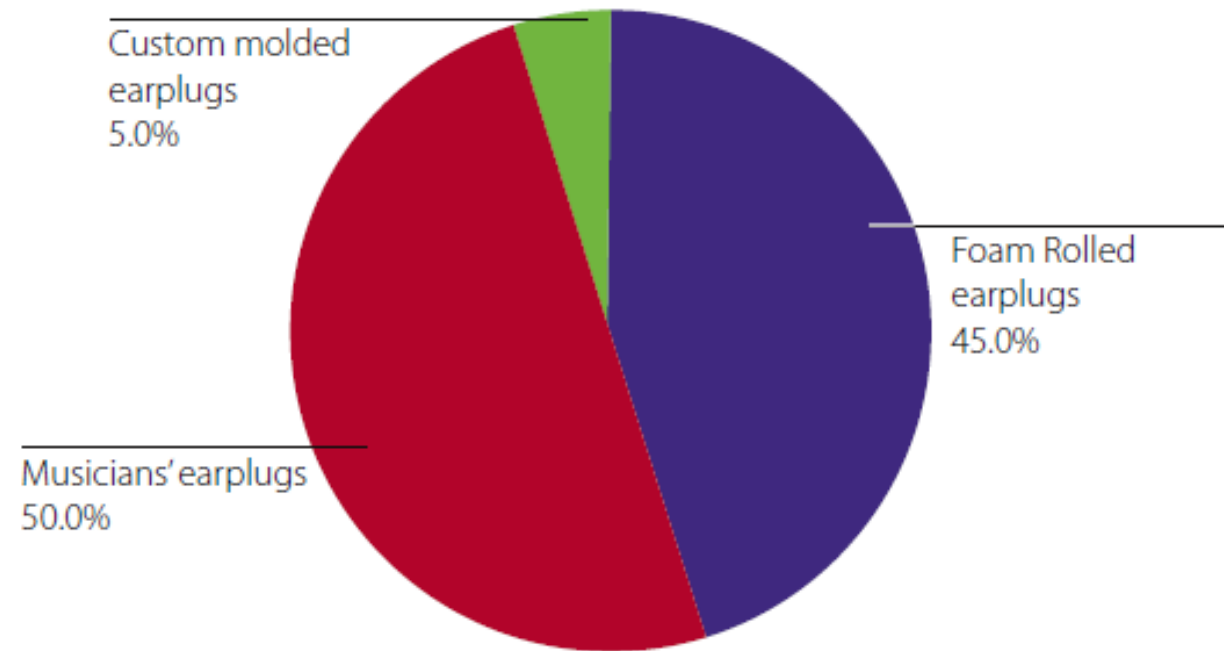


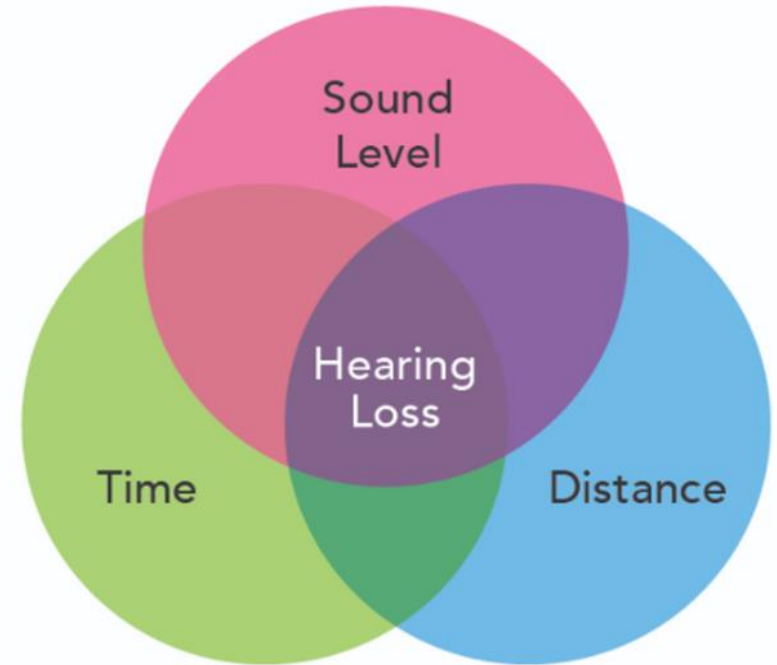
Figure 2: Hearing protection device use for at-risk individuals.

Trends

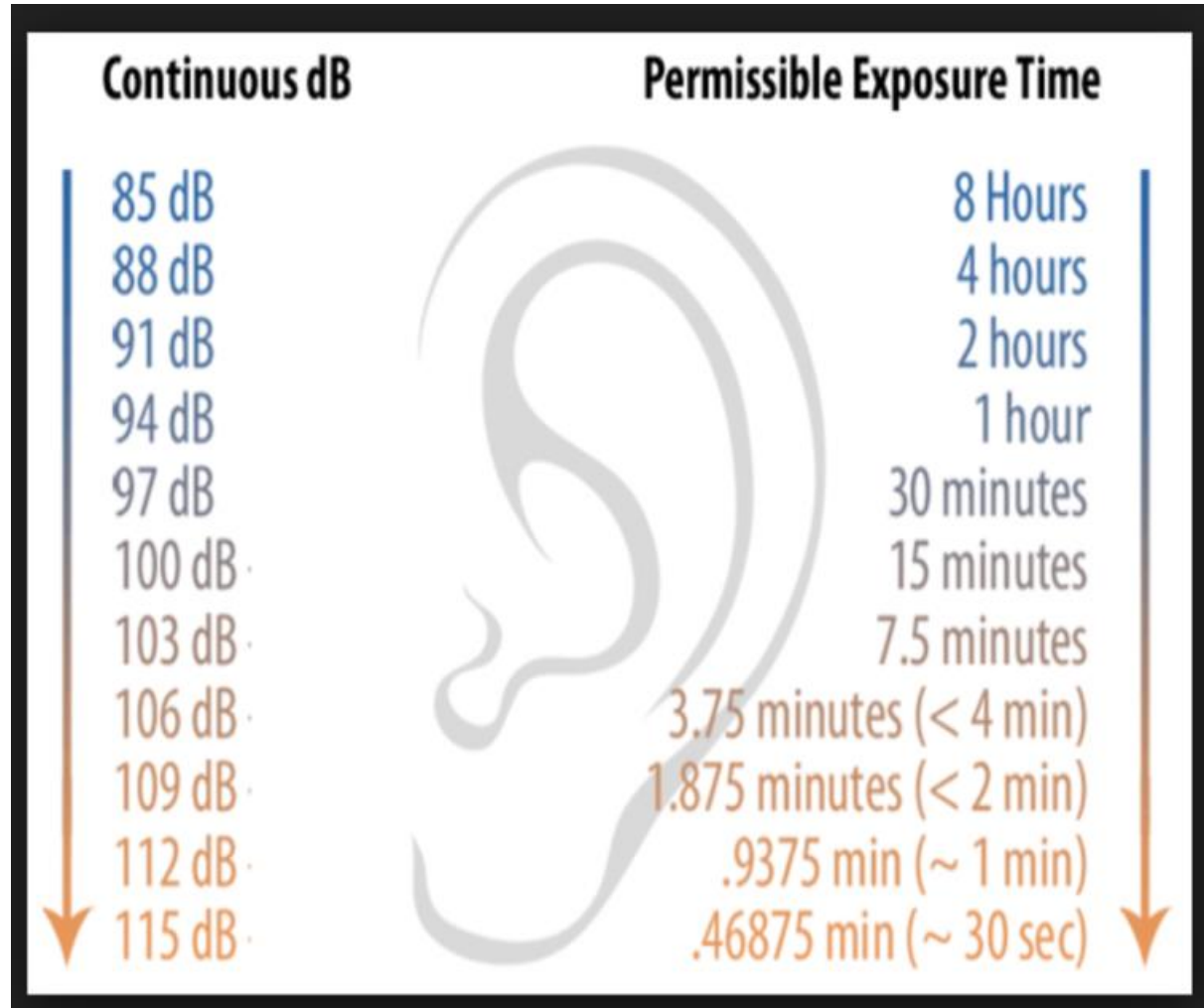
- How hearing screenings are advertised may influence who attends
- Are DPOAEs another valuable screening tool?
 - Recently added to our screening events
- Relatively low THI questionnaire scores supported by few music students seeking tinnitus rehabilitation

Hearing Wellness Education for Student Musician

- Understanding Music Induced Hearing Disorders (MIHDs):
 - Hearing loss, tinnitus, hyperacusis, sound distortion
- Understand the relationship of sound level, time, and distance from sound source



Sound Pressure Level (SPL) & Exposure Time



Continuous dB	Permissible Exposure Time
85 dB	8 Hours
88 dB	4 hours
91 dB	2 hours
94 dB	1 hour
97 dB	30 minutes
100 dB	15 minutes
103 dB	7.5 minutes
106 dB	3.75 minutes (< 4 min)
109 dB	1.875 minutes (< 2 min)
112 dB	.9375 min (~ 1 min)
115 dB	.46875 min (~ 30 sec)

The more intense the sound, the shorter exposure duration necessary to prevent auditory injury.

Education Delivery

- In person counseling at hearing screening
- Past in person and virtual presentations
- 2019 “Artist is an Athlete” symposium
- Wellness Initiative Newsletter
 - Including blog articles
- WellCast youtube video on SMTD channel
- SMTD social media

Bucket Analogy



*LOUDNESS,
DURATION &
DISTANCE*

*All contribute to how we fill our
“bucket” for our daily dose of sound.*

Sound Levels of Music

- Normal piano practice 60 -70dB
- Fortissimo Singer@ 3' >70dB
- Chamber music, small auditorium 75 - 85dB
- Clarinet 85 - 114dB
- Violin 82 – 92 dB
- French horn 90 - 106dB
- Trombone 85 - 114dB
- Tympani & bass drum 106dB
- Walkman on 5/10 94dB
- Symphonic music peak 120-137dB
- Amplified rock @ 4-6' 120dB
- Rock music peak 150dB

How are you filling your bucket?



 musicbyknox

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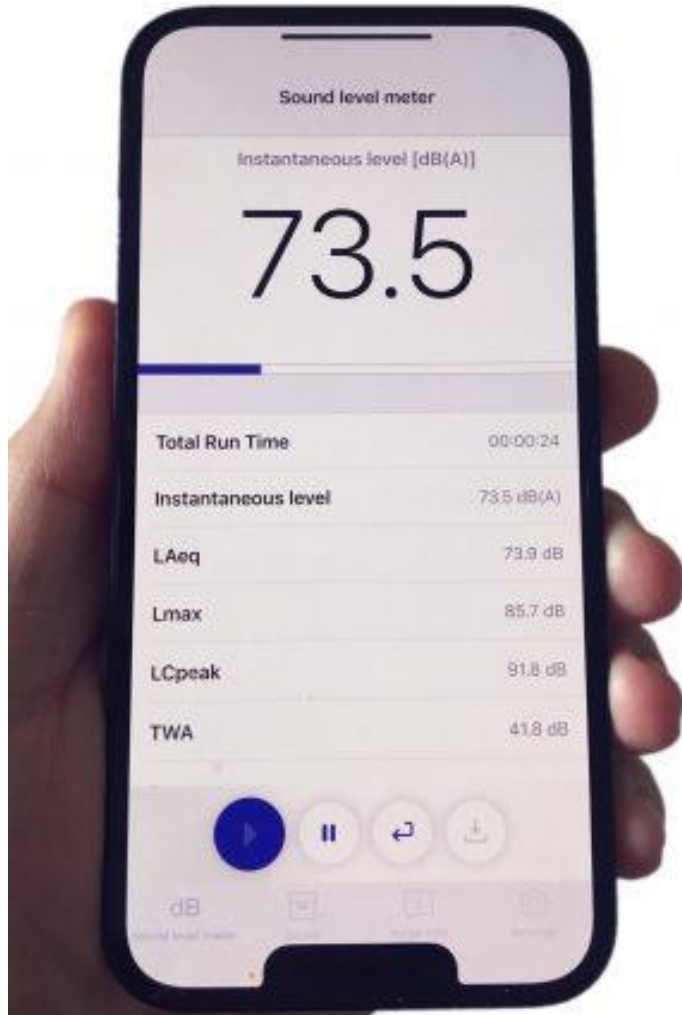


Improving awareness of sound/listening levels

- Every student musician is going to have their own musical sound exposures, but they will also be adding their own personal recreational/occupational everyday sound exposures to their “bucket” as well.
- What is the easiest way increase their awareness of how loud their sound exposures may be?

Hint hint... RING RING!

Sound Level Meter Apps

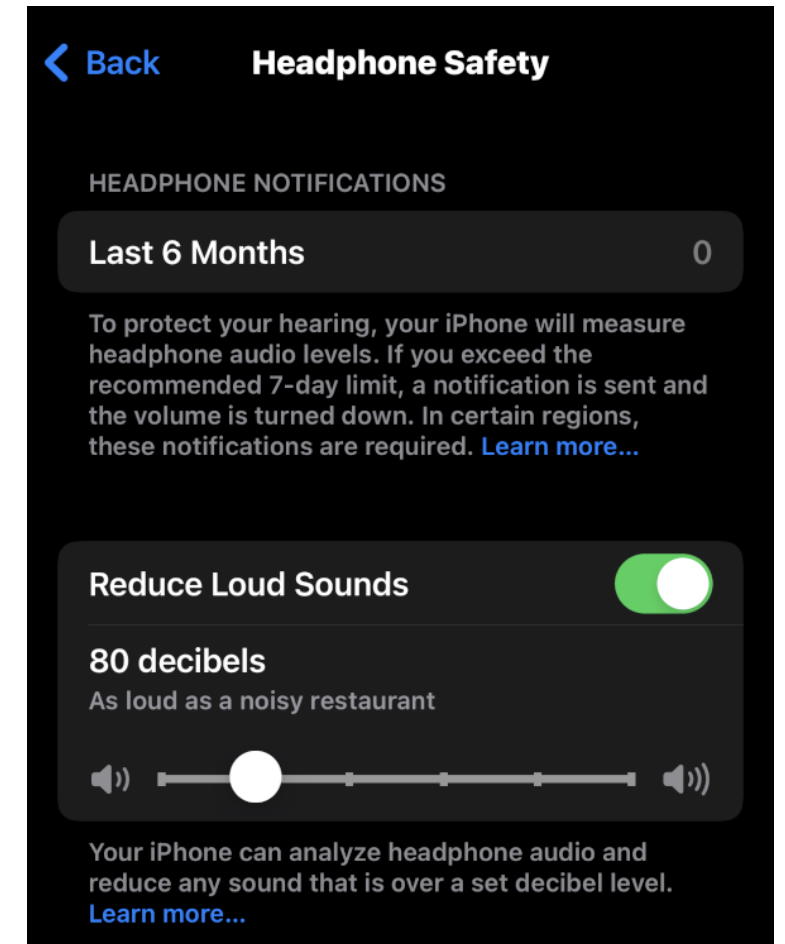
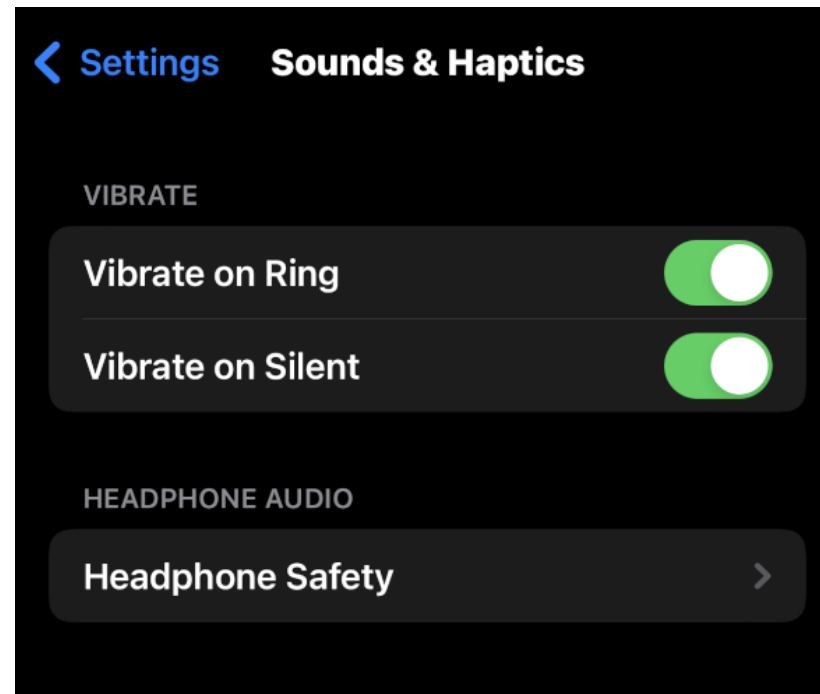


- Accurate enough for general awareness of environment
- Usually a free smart phone app
- Consider NIOSH sound level meter

Volume Limit for Apple



Settings → Sounds & Haptics → Headphone Safety

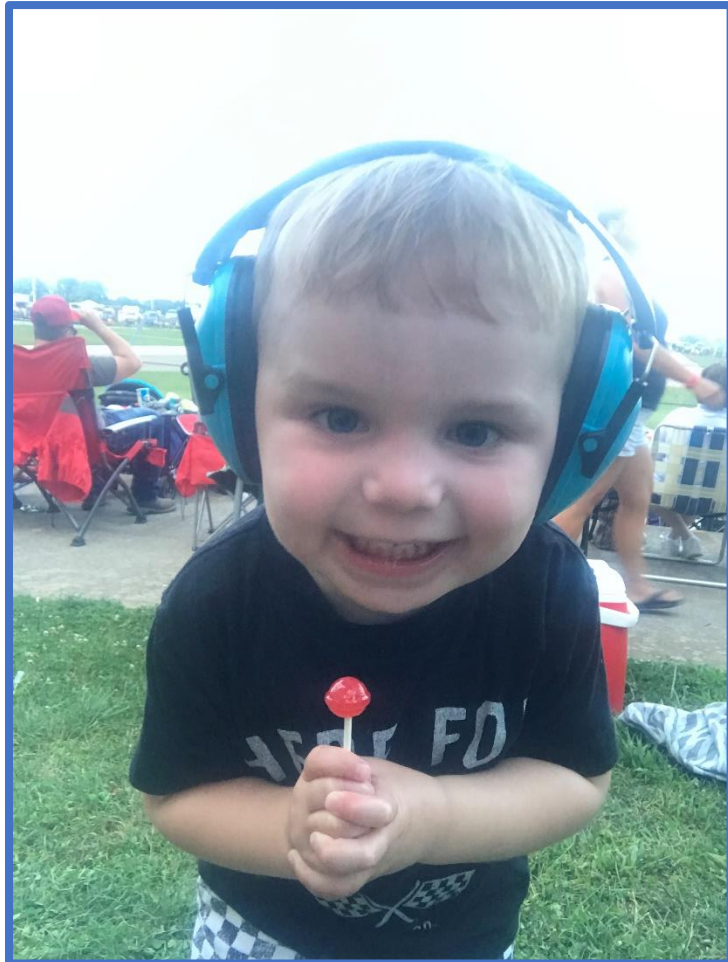


Volume Limit for Android



1. Settings > Sounds and vibration > Volume.
2. Expand the three-dot menu in the top right and tap Media volume limit.
3. On the next screen, you can turn On the media volume limit.
4. Next, move a slider to choose a custom volume limit and set a volume limit PIN.

MIHDs prevention stage



Role of the audiologist

Returning to our definition of a hearing conservationist:

“An individual who focuses on the prevention of auditory disorders as a result of potentially hazardous exposure.”

What is our role in the support of a student musician?

Call to action

- Our scope of AuD practice says we are all hearing conservationists!
- Audiologists have the educational and clinical background to best support musicians
- Musicians are patients for life

Future Directions

- Fitting of Westone non-custom musician earplug
 - Fitting with audiology
 - Real Ear Verification
- Follow-up, longitudinal earplug questionnaire
- Custom hearing protection via support or financial donors
- Small group educational discussions
 - Tinnitus coping strategies for any musician
 - Opportunity for musicians who have expressed specific interest
- Increase support for Michigan Marching Band

Future Directions

- Bring knowledge of the loud music issue to local school districts
- Share resources with local school district directors, administrators, and educators

Helpful Resources

- National Hearing Conservation Association (NHCA)-
www.hearingconservation.org
- Performing Arts Medicine Association (PAMA)- www.artsmed.org
- National Institute on Deafness and Other Communication Disorders (NIDCD), Noisy Planet- www.noisyplanet.nidcd.nih.gov
- American Academy of Audiology Clinical Consensus Document-
Audiological Services for Musicians and Music Industry Personnel

Helpful Resources / References

- The Importance of Hearing Protection for Musicians (schoolofrock.com)
- 5 Tips for Musicians About Protecting Your Hearing From Loud Music (lucidhearing.com)
- Considerations and Tips for Hearing Conservation: Information for Musicians | Iowa Head and Neck Protocols (uiowa.edu)
- Protect Your Hearing When You Play a Musical Instrument | Noisy Planet (nih.gov)
- Protecting Your Hearing as a Musician - School of Music | CSUF (fullerton.edu)
- Protecting the Hearing of Young Musicians - San Diego - Sharp Health News
- Hearing Protection Success: Musicians Have a Favorable Response to Hearing Protection and Listeners
- Are Unable to Identify Music Produced by Musicians Wearing Hearing Protection - PubMed (nih.gov)
- 4a_NASM_PAMA-Student_Guide-Standard.pdf (arts-accredit.org)
- Musicians and the Prevention of Hearing Loss: An Introduction (audiologyonline.com)
- H.E.A.R. Are You At Risk? Hearing Education and Awareness for Rockers (hearnet.com)
- Hearing Conservation Through Partnership With Musicians : The Hearing Journal (lww.com)

Helpful Resources / References

- Music for the Hearing Care Professional.pdf
(marshallchasinassociates.ca) www.audiology.org/wp-content/uploads/2021/05/Musicians-Consensus-Doc_Final_1.23.20.pdf
- NASM-PAMA Advisories on Hearing Health - National Association of Schools of Music (arts-accredit.org)
- www.pluralpublishing.com/publications/hearing-loss-in-musicians-prevention-and-management
- Marshall Chasin | Hear The Music @ HearingHealthMatters.org (blog)
- (PDF) MTNA E-Journal Musicians' Hearing Conservation Nov 2021
(researchgate.net)

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