Development of a Computer-based Hearing Loss Prevention Education Program for Veterans and Military Personnel

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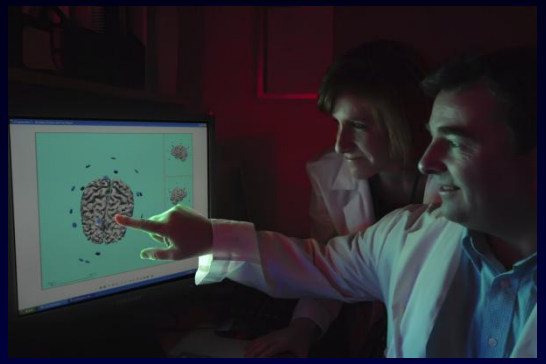


National Center for Rehabilitative Auditory Research (NCRAR)

VA RR&D Centers of Excellence

Limb Loss & Prosthetics
(Seattle, WA)

Functional Electrical Stimulation
(Cleveland, OH)

Wheelchair Technology
(Pittsburgh, PA)

Innovative Visual Rehabilitation
(Boston, MA)

Restorative & Regenerative Medicine
(Providence, RI)

Auditory Rehabilitation
(Portland, OR)

Spinal Cord Injury & MS
(West Haven, CT)

Bone & Joint Rehabilitation
(Palo Alto, CA)

Spinal Cord Injury
(Bronx, NY)

Platform Technology
(Cleveland, OH)

Aging & Vision Loss
(Decatur, GA)

Brain Rehabilitation
(Gainesville, FL)

Spinal Cord Injury
(Miami, FL)

Exercise & Robotics
(Baltimore, MD)

Mission of the NCRAR

"To benefit Veterans by alleviating the economic, social and communicative problems resulting from auditory system dysfunction."

Hearing Loss Prevention Program

DoD / VA Joint Incentive Fund (JIF)

JIF is a collaborative program between the Department of Defense and the Department of Veterans Affairs. The program's goals are to enhance cost-effectiveness of, quality of, and access to health care for military personnel and Veterans.

The hearing loss prevention education program described here is a JIF project.

The goal of this project is to create a self-administered, computer-based, interactive, multimedia Hearing Loss Prevention Program (HLPP) that can be delivered at military bases, primary care and other medical settings.

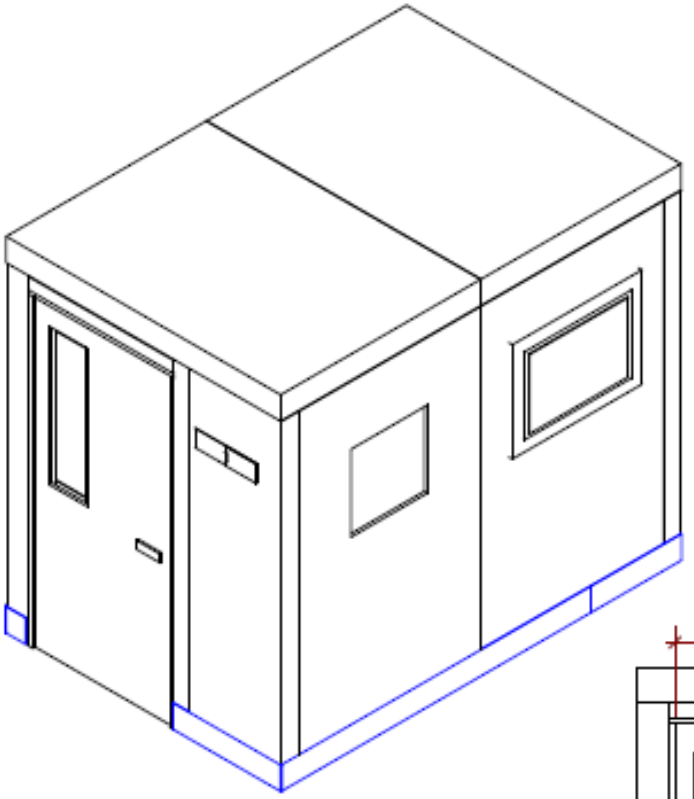
Initial Installations

- Portland VA Medical Center
- Madigan Army Medical Center, Fort Lewis, Washington
- Womack Army Medical Center, Fort Bragg, North Carolina

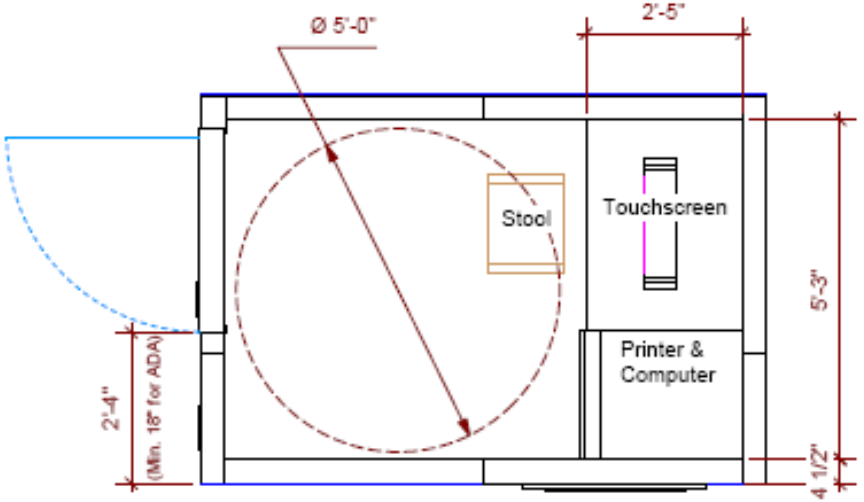
Program Elements

• Sound-attenuated enclosure in which one participant at a time uses the program

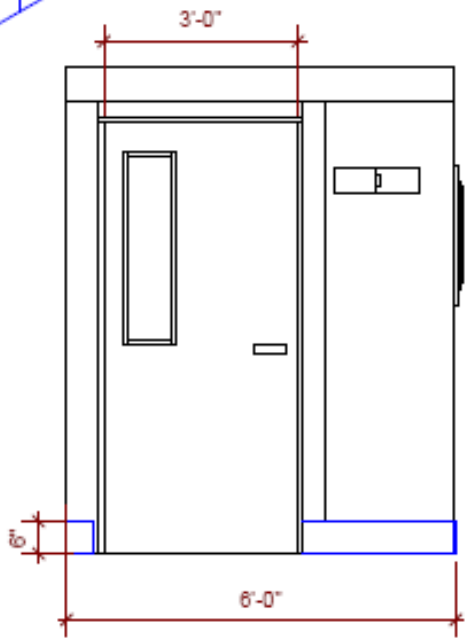
FLAT SCREEN
WILL PROJECT
VIDEO IMAGES



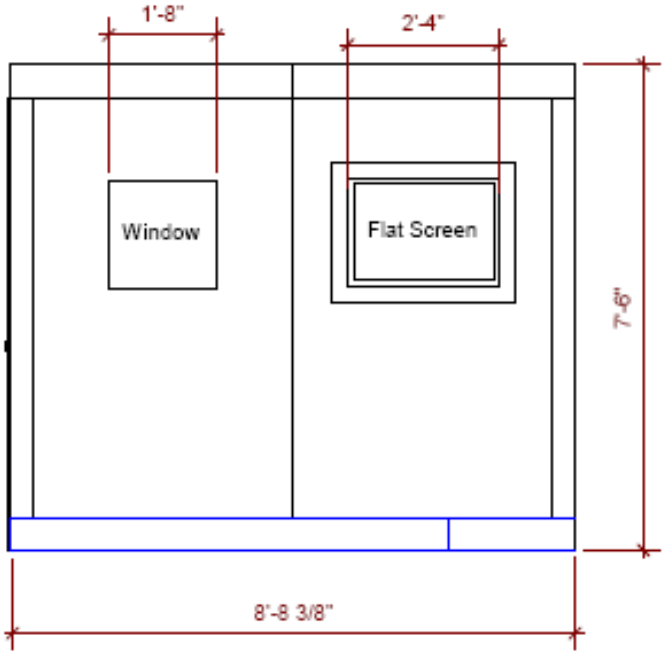
1/2 Isometric View
Scale: 1/2" = 1'-0"



2/2 Plan View
Scale: 1/2" = 1'-0"



3/2 Front Elevation
Scale: 1/2" = 1'-0"



4/2 Side Elevation
Scale: 1/2" = 1'-0"

Oregon Museum of Science and Industry (OMSI)


Dangerous Decibels™
Noise-Induced Hearing
Be Prevented
Dangerous Decibels™ consists of:
• a science exhibition at OMSI
• an educational outreach program for schools

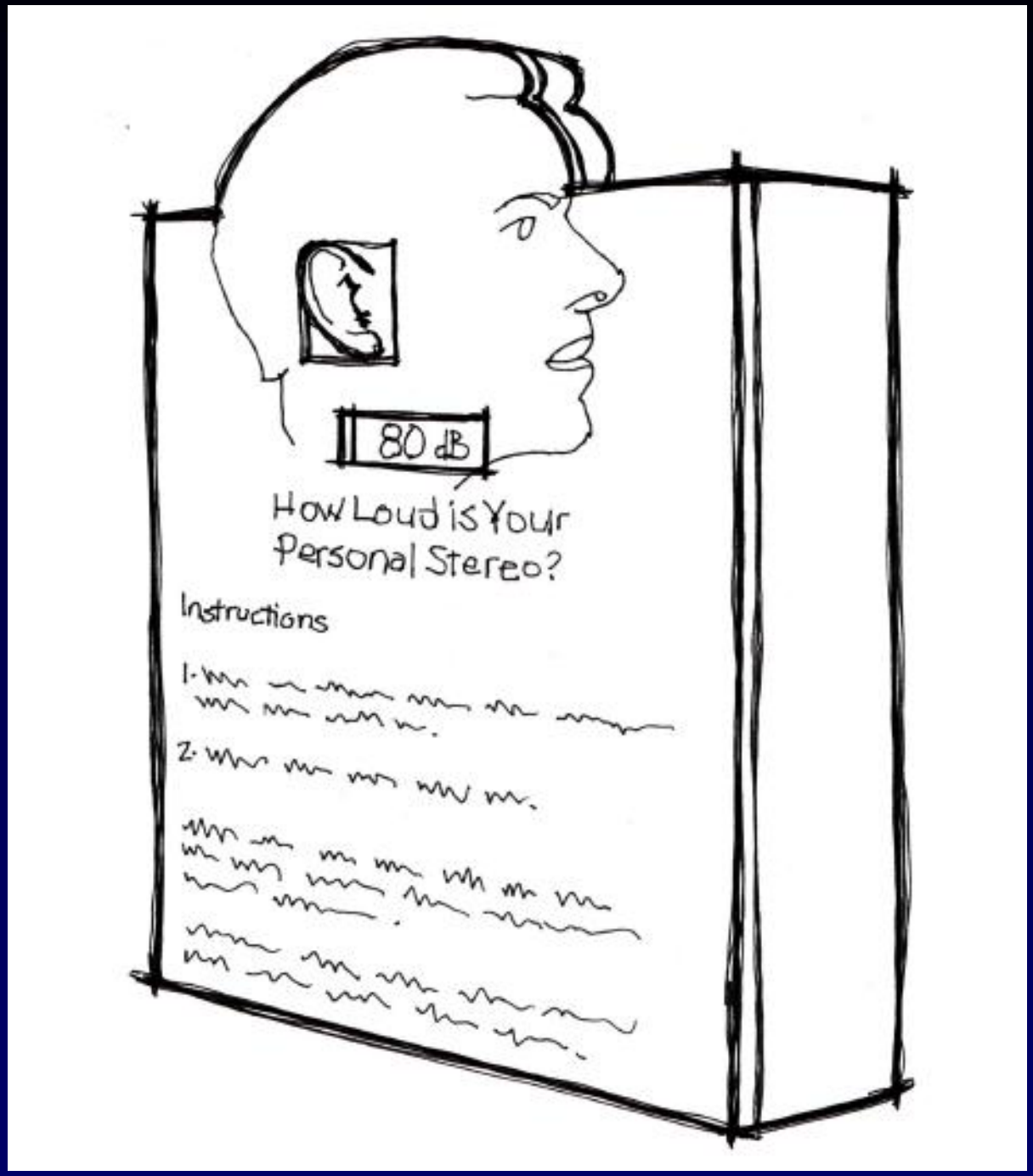

TESTING
In Progress


Welcome to the
Dangerous Decibels project!

booth walls are modular, so the door and window can be put in 3 different configurations

foam insulation between double walls


FLAT
VIDEO
SCREEN
WILL GO
HERE
iPod
TEST
EAR
WILL
GO
HERE


80 dB
How Loud is Your
Personal Stereo?
Instructions
1.
2.

Program Elements

- Computer touch screen allows participants to select activities
- Printer allows participants to receive copies of hearing test results and to print other info sheets

All booth interior surfaces are carpeted

Welcome to the Hearing Education Center

Touch the screen to begin

A Joint Incentive Fund (JIF) Program

Sponsored by

Developed by **NCRAR**
National Center for Rehabilitative Auditory Research
VA Rehabilitation Research & Development Service

LEFT

RIGHT

You need to wear headphones to hear the presentation and to take the hearing test.

Put the BLUE headphone on your LEFT ear, and the RED headphone on your RIGHT ear.

BEGIN

SKIP HEADPHONE PRESENTATION

Now we will set the volume.

Please touch the button marked
Play on the screen.

You will hear music.

SKIP HEADPHONE PRESENTATION

Do you hear music?

If you did not, or if the music was quieter than you'd like, press the up arrow.

If you hear music that was louder than you'd like press the down arrow.

When the volume is just right press "OK".

OKAY

SKIP HEADPHONE PRESENTATION

Please answer the following questions.

	Yes	No
Have you used this program in this booth before?	○	○
During the past year, I *(check all that apply)*		
have been around loud sounds that made my ears hurt or "ring"	○	○
used power tools or other loud machinery	○	○
fired a gun	○	○
listened to loud music	○	○

SKIP NEXT

I am □MALE □FEMALE

My age:

□ **1-17 years**	□ **50-59 years**
□ **18-29 years**	□ **60-69 years**
□ **30-39 years**	□ **70-79 years**
□ **40-49 years**	□ **80+ years**

I wear ear plugs or ear muffs when I am around loud sounds:

□ALWAYS □SOMETIMES □NEVER

Intro Video

What would you like to do?

Learn why, when and how to protect my hearing

Learn how hearing works and how loud sounds damage hearing

Learn how sound intensity is measured and which sounds are too loud

Take a screening test of my hearing

Learn about the consequences of hearing loss and listen to demonstrations of simulated hearing loss

Learn how to select and use hearing protective devices

Evaluate the fit of my ear plugs

Learn about tinnitus (ringing of the ears)

Learn about hearing health care services at

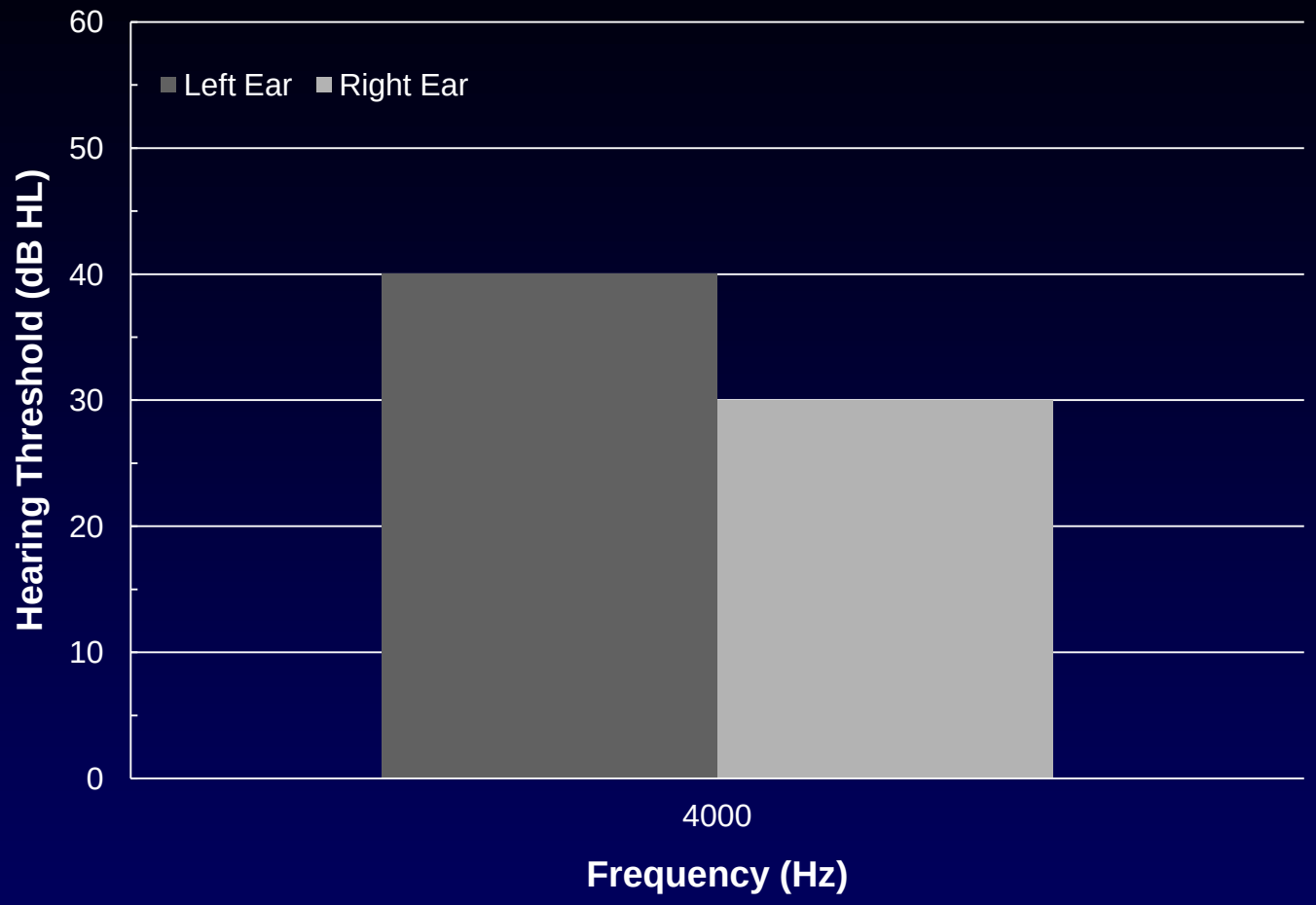
DONE

Hearing Screening Test

- Self-administered
- “Quick Test” screens 4000 Hz to 20 dB HL – takes about 2 minutes for both ears
- More Complete Test screens 3, 4 and 6 kHz to 20 dB HL – takes about 6 minutes
- Pulsed tones are used
- Participants have the option of printing a graph of results + an info sheet

TEST IN PROGRESS . . .

PRESS HERE WHEN YOU HEAR A TONE



Your results suggest that you may have hearing loss. However, this program tested only one frequency of your hearing, and noise outside of the booth may have caused problems with the test. To know your hearing results for sure, it is best to get a complete hearing test from an audiologist or physician.

Learn Why, When and How to Protect Your Hearing

TEST YOUR KNOWLEDGE

How can you protect your hearing?

a) Wear hearing protection
b) Move away from the noise source
c) Turn down the volume of loud music
d) All of the above

Learn How Hearing Works and How Loud Sounds Damage Hearing

TEST YOUR KNOWLEDGE

Hair cells are located in the

a) outer ear
b) middle ear
c) inner ear (cochlea)
d) brain

Learn How Sound Intensity Is Measured and Which Sounds are Too Loud

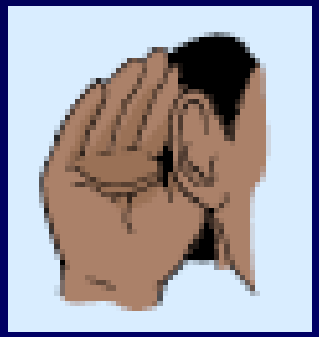
TEST YOUR KNOWLEDGE

The louder a sound is, the

- MORE
- LESS

time it takes to damage your hearing.

Learn About the Consequences of Hearing Loss and Listen to Demonstrations of Simulated Hearing Loss



TEST YOUR KNOWLEDGE

Hearing loss can contribute to

a) Communication problems
b) Frustration and isolation
c) Tinnitus (ringing in the ears)
d) All of these

Learn How to Select and Use Hearing Protective Devices

Foam Earplugs

Foam earplugs are made from expandable foam designed to conform to the shape of your ear canal. They provide a good combination of protection and comfort for most people.

Combat Arms Earplug

Combat arms earplugs contain a linear and non-linear setting. This means that they have the ability to protect against continuous noise (such as vehicles or machinery) as well as level-dependent or impulse noise (such as weapons fire).

Standard Earmuffs

The most common type of earmuff, these can be worn over the head, behind the head, or under the chin, depending on the model.

Tactical Communication and Protective Devices (TCAPs)

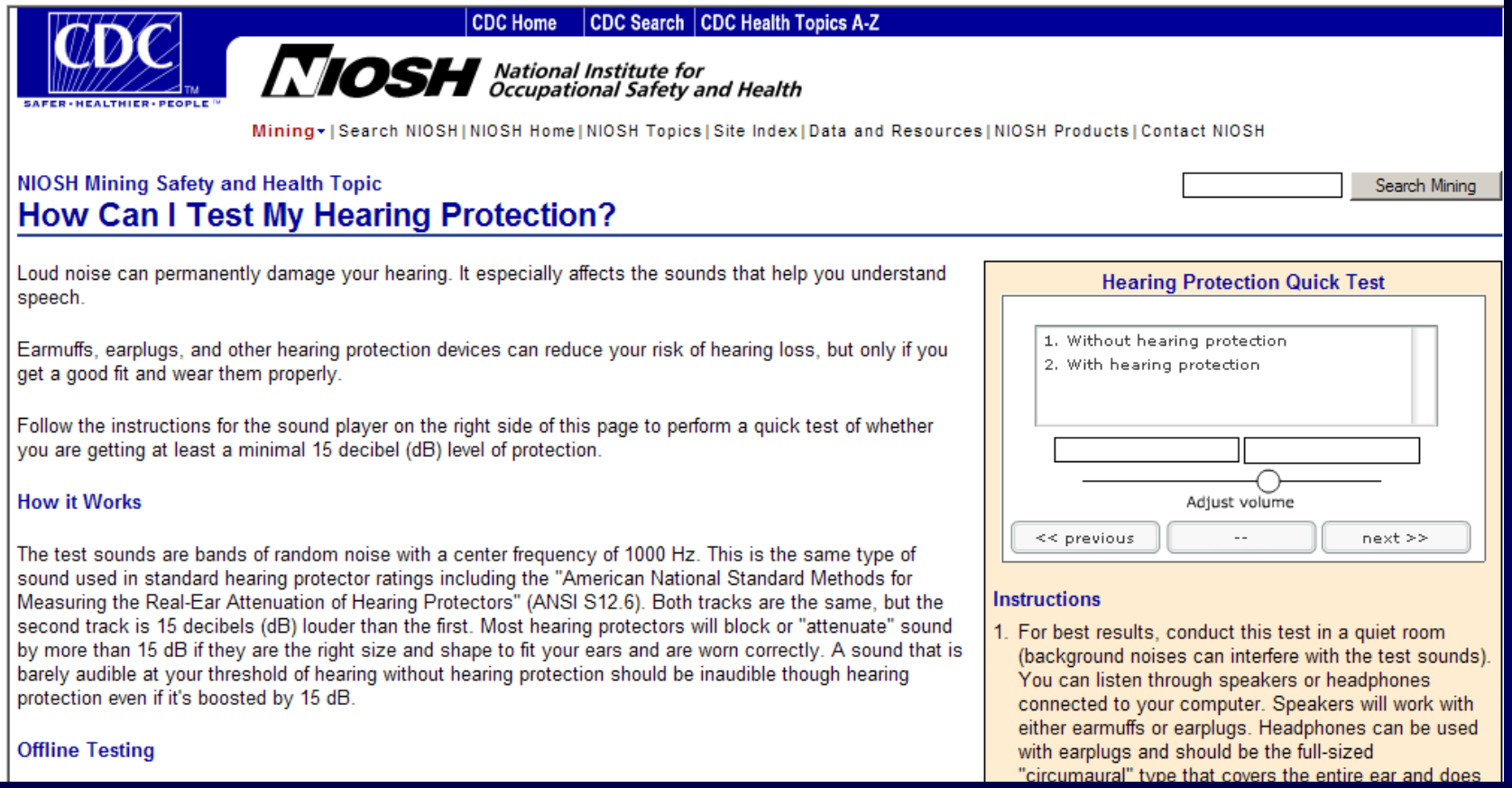
TCAPs combine hearing protection with electronic systems that enable you to communicate with other members of your unit and still hear ambient sounds to provide situational awareness.

TEST YOUR KNOWLEDGE

What is the best type of hearing protection for you?

a) The one everybody else is using
b) The one you will wear consistently
c) Ear muffs
d) Ear plugs

Evaluate the Fit of My Ear Plugs



Module based on NIOSH Quick Fit Test

www.cdc.gov/niosh/mining/topics/hearingloss/quickfitweb.htm

Learn About Tinnitus (ringing in the ears)

TEST YOUR KNOWLEDGE

Tinnitus can occur

a) After exposure to loud music
b) If someone uses power tools without wearing hearing protection
c) As a consequence of hearing loss
d) All of these are true

Learn About Hearing Healthcare Services at Portland VA Medical Center

Do you think this program is a good way to provide information to Veterans and their families?

☐YES ☐NO

After viewing this program, will you be more likely to protect your hearing from loud sounds?

☐YES ☐NO

GOALS OF HEARING LOSS PREVENTION EDUCATION

- raise awareness about
  - mechanisms of hearing,
  - how and why hearing loss occurs,
  - consequences of hearing loss,
  - how to prevent NIHL -- protect ears
- change knowledge, attitudes, behaviors
- reduce the prevalence of NIHL

Formal Evaluation of the Program and Its Effectiveness for Veterans

- ***VA RR&D Merit Review 3-Year Study***

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Future Applications

Additional refinement and dissemination of the program throughout the VA, DoD and other healthcare systems *(booths are not necessary for the education program)*

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Thank You!

Questions and Discussion