# SHOEBOX® Platform
## User Guide

*Think Outside of the Booth!®*

# Introduction

Welcome to the SHOEBOX® Platform!

SHOEBOX Platform is built with an ISO 13485 certified quality management system and listed as a Class II medical device with US FDA.

This user guide will help you learn all the capabilities of the SHOEBOX Platform.
If you have any questions about SHOEBOX, please contact support@shoebox.md.

## Prerequisites

Before you start using SHOEBOX, check the following requirements:

- A "Full HD" screen of 1920 x 1080 pixels is recommended for optimal work conditions. A minimum horizontal resolution of 1280px is required.
- Google Chrome with automatic updates (activated by default). **SHOEBOX Platform is only supported by Google Chrome**.
- Noah 4.5.x or more recent versions to use Noah Mobile functions.
- Noah 4.2.x or more recent versions to use the module for Noah.
- Microsoft Windows 7 or later or any other operating system supported by Google Chrome including MacOS 10.13 or later.
- Internet connectivity with minimum speed of 2 Mbit/sec.

## Safety

Before you start using SHOEBOX, please read the following safety information:

- There are no known contraindications for the use of the SHOEBOX Platform medical device software
- The system is designed so that it can produce sound limited up to 120 dB hearing level (HL) output, which is based on the common diagnostic practice of audiometers (according to IEC 60645-1 and IEC 60645-2)
- No alarms are used in the system. Error and warning messages are used in the system to inform abnormal device state (e.g. no internet connectivity with the server, when attempting to exit the test procedure before save etc)
- A warning message appears when attempting to exceed 100dB, which warns the operator that higher tone levels may damage the patient's hearing. The operator must approve the message before being able to raise higher than 100dB
- A warning message appears in the application which warns about sensitive patient data, whenever the user is intending to export the data
- Subscription validity defines the device lifetime and there is no processing required between uses of the software device.

SHOEBOX Ltd.
301-80 Aberdeen St
Ottawa, ON, Canada K1S 5R5
www.shoebox.md
1-877-349-9934

SHOEBOX® Platform is a Class II medical device listed with
FDA (Registration No: 3007307502)
and Health Canada (License No: 93571).

SHOEBOX® Platform is a web-based Type 2 Audiometer (as defined in ANSI/ASA S3.6-2018 and IEC 60645-1:2017) intended for diagnosis of human hearing loss.

A serious incident is one that results or could result in death, life threatening illness or injury. Please report any serious incident occurring in relation to the use of the SHOEBOX Platform directly to SHOEBOX Ltd. and your local health authority.

IFU-31 1.0 2022/06

Legend:

REF Catalog Number

Manufacturer

Consult IFU

A paper copy of this document is available upon request.

Please see transducer documentation for independent instructions for use related to hardware.

# Contents


Introduction 2
- Prerequisites 2
- Safety 2

Contents 4

Initial Setup 7
- Account Creation 7
  - Don’t know your SHOEBOX Login? 8

Home Page Walkthrough 9
- Activity Feed 11
  - Quick actions 11

Patient List 12
- Accessing the Patient List 12
- Adding a New Patient 12
- Setting your Active Patient 14
- Searching for Existing Patients & Viewing Results 14

Administrator Role 15
- Administrative Actions 15
  - Adding New Users 15
  - Managing Users 16
  - Downloading Center Data 17
  - Modifying Center Information 18

Noah Integration 19
- Installation and Configuration 19
  - Installing SHOEBOX Module in Noah 19
  - Transferring Data 20
- Plugin Features 20
  - Opening the SHOEBOX Platform from Noah 20
  - Syncing Data 21
  - Changing Centers and Switching Users 21

Profile Configurations 21
- Profile Setup 21
  - Editing Your Profile 21
  - Changing the Email Settings 22
  - Changing the Center 23

Patient Folder 23

Patient Information 24
Generating a Report 25
History 25
Case History 26
Fitting 29

Audio Setup 30
Setting up your booth 30
Setting up Free-Field 32

Otoscopy 36

Pure Tone Testing 38
Accessing the Pure Tone Test 38
To access the pure tone test page: 38
Navigating the Pure Tone Test Page 38
Completing a Pure Tone Test 39
Setting up the test 39
Starting the Test in Manual Mode 39
Switching Ears 40
Switching to Bone Conduction Testing 41
Applying Masking 42
Talk Forward 43
Talk Back 43

Speech Testing 44
Accessing the Speech Tests 44
Navigating the Speech Test Page 44
Completing a Speech Test 45
Starting the Speech Test 45
Starting a Discrimination Test 46
Applying Masking 48

Speech Testing (In Noise) 49
Accessing the Speech Test (In noise) 49
Navigating the Speech Test (In Noise) Page 49
Completing a Speech Test (In Noise) 50
Starting the Speech Test 50

ANL Test 52
Accessing the ANL Test 52
Navigating the ANL Test Page 52
Completing an ANL Test 53
Stage 1: Measuring the MCL (Most Comfortable Level) 53
Stage 2: Measuring the BNL (Background Noise Level) 53
ANL Test Controls 53

Ambiance Studio 56
Accessing the Ambiance Studio 56
Creating your Ambiance 56
Listening to your ambiance 59
Accessing your Saved Ambiance 60
Sonogram 61
Accessing the Sonogram 61
Reading the Sonogram 61
Starting a Remote Session 62
Getting Started 62
Invite a Remote User 62
Video Conferencing 64
Remote Otoscopy 65
Remote Pure Tone Test 68
Switching to Bone Conduction 69
Prepping the Patient: Placement 69
Remote Speech Test 69
Reviewing Results 70
Changing Views 71
Expanded View 71
Condensed View 71
All results enabled 72
Some results disabled 72
Graph Comparisons 73
Detailed Results 74
Detailed Speech Results 74
Keyboard Shortcut Overview 75
Pure Tone 75
Speech 75
Speech Discrimination + Speech in Noise 76
ANL 76
Otoscopy 76
SHOEBOX Platform Specifications 77

# Initial Setup

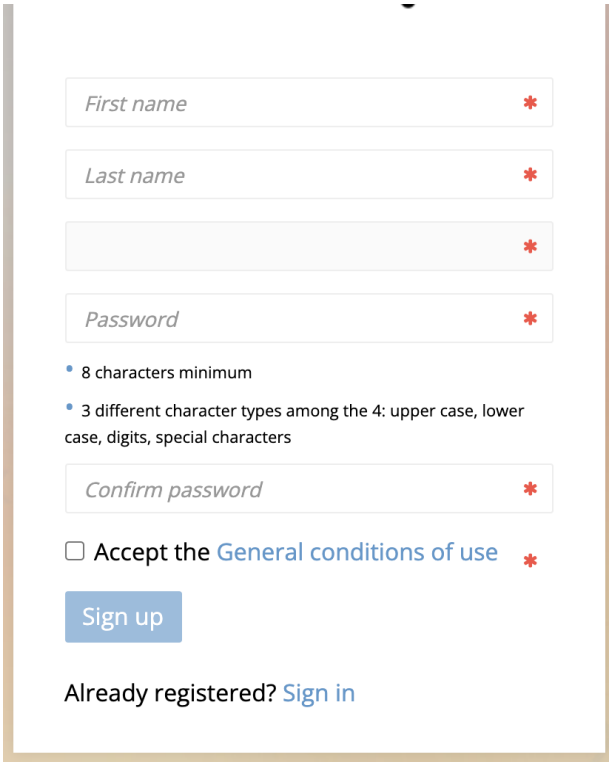
As a web-based application, SHOEBOX does not require any downloads or installation. Simply open a new window in Google Chrome, navigate to your login page, and use your credentials to log in to the platform.

***Note:*** the SHOEBOX Platform is **only supported by Google Chrome.**

## Account Creation

To create an account:

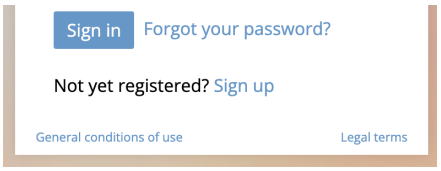
1. Click on the invitation that was sent to you via email by your administrator or support team
2. Enter your first and last name
3. Create a password according to the security conditions, and confirm your password
4. Accept the terms of use and sign in



## Don’t know your SHOEBOX Login?

***Hint:*** the email is the one where you receive your SHOEBOX emails, and the password is the one you created in the step above. If you don’t know what these are, contact support@shoebox.md

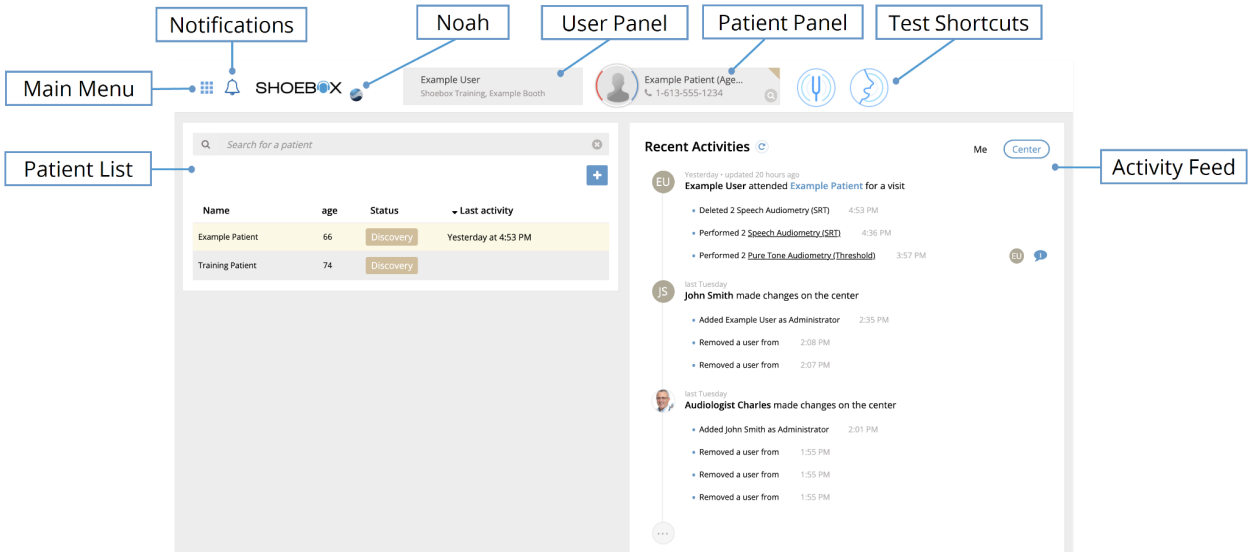
If you forgot your password, click on the “Forgot your password?” link on the login page. You will be prompted to enter your email address to receive an email which will contain a link for you to reset your password. If you are not yet registered, contact the support team or your center administrator in order to obtain an invitation to access the platform.




After logging in to SHOEBOX Platform, Chrome will open three separate pop-ups to ask for microphone, webcam, and storage permissions. You will need to allow all three of these permissions in order to use the platform without any errors.

# Home Page Walkthrough

After logging in to your account, you will find yourself on the Patient List page, which acts as the homepage for the platform.




This page consists of the following:

**Patient List:** Provides a list of patients in your center. Clicking on a patient's name will take you to their individual Patient Folder.

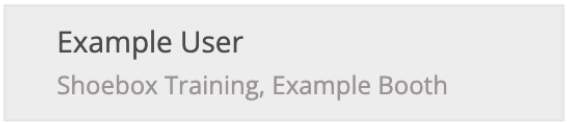
**Main menu:** Provides access to the Patient List, Patient Folder, Test Menu, Setup, Audio Setup, Otoscope, Support, and Logout icons.
***Note:*** additional features may be added to your account depending on availability.

**Notifications**: Notifies you of any updates or areas you have been tagged in by other users

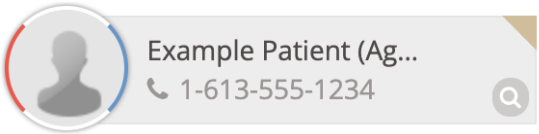
**SHOEBOX Logo:** Clicking this will take you to the Patient List page, which acts as the homepage for the platform.

**Noah:** Indicates the connection status of Noah.

**User Panel:** Indicates the user's name, the center's name, and currently selected booth. Clicking this will take you to the Configuration page.




**Patient Panel:** Indicates the patient name, age, and hearing status based on tests previously done (the colored dot on the left and/or right ear of the patient panel). Clicking on the patient panel will take you to their individual Patient Folder.



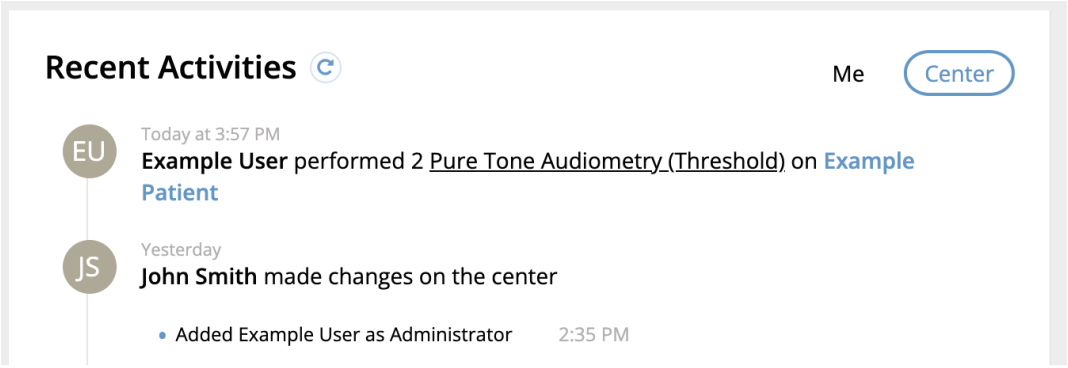

**Test Shortcuts:** Presents shortcuts for both the Pure Tone Test and Speech Test



**Activity feed:** Displays all the activities that were performed in your center (and Noah if the login details are identical.)

## Activity Feed

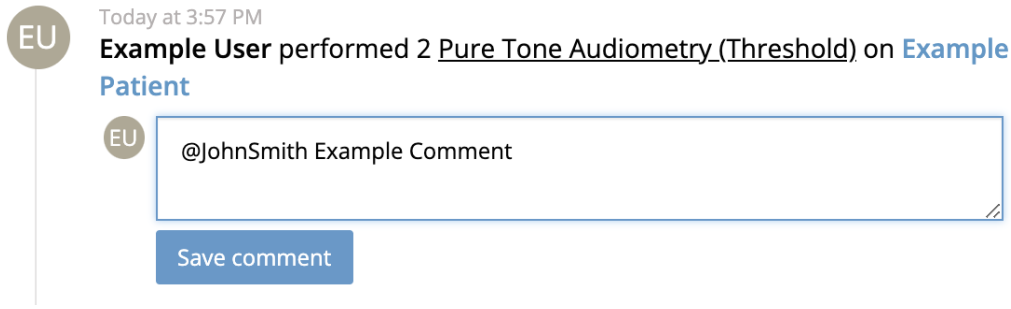
The activity feed summarizes all the activities carried out by you and other users in your center. The activity feed is found in the right panel of the home page, next to the patient list.



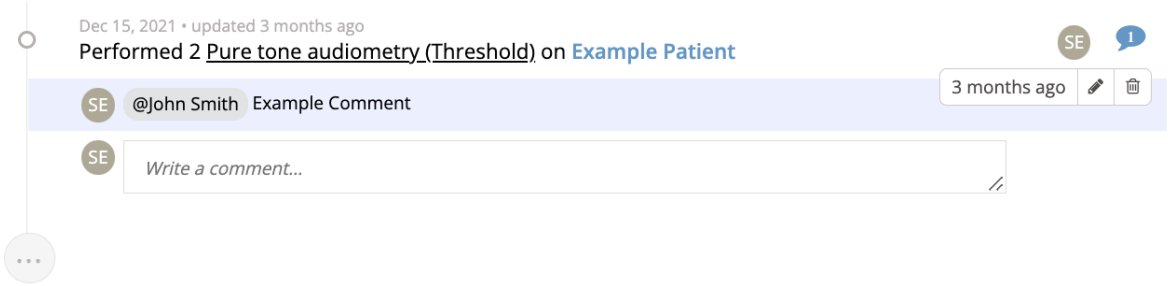

***Note:*** if you are an administrator you can swap between your activities and other users' activities by clicking on "Me" or "Center". However, if you are not an administrator, you will only see your activities.

## Quick actions

- To add a comment to an activity and start a conversation with another user, click on the comment icon that appears when hovering over an activity. Enter your comment, then click on **Save comment.**
- To notify another user to join a conversation, type in @ followed by their name in the comment section.




***Note:*** You can edit or delete your comment after you save it.




- To display the test results in the patient's folder, click on the patient's name
- To expand the list and view past activities that are hidden from view, click on the three dots icon at the bottom of the activity feed

# Patient List

The patient list allows you to add new patients to your center and search for existing patients.

## Accessing the Patient List

The patient list is found on your center's home page. When you first log in, you will find yourself here. If you navigate away from this page, you can return to it by either clicking on the SHOEBOX logo in the top left, or by clicking on the Patient List icon in the main menu.




## Adding a New Patient

To add a new patient:

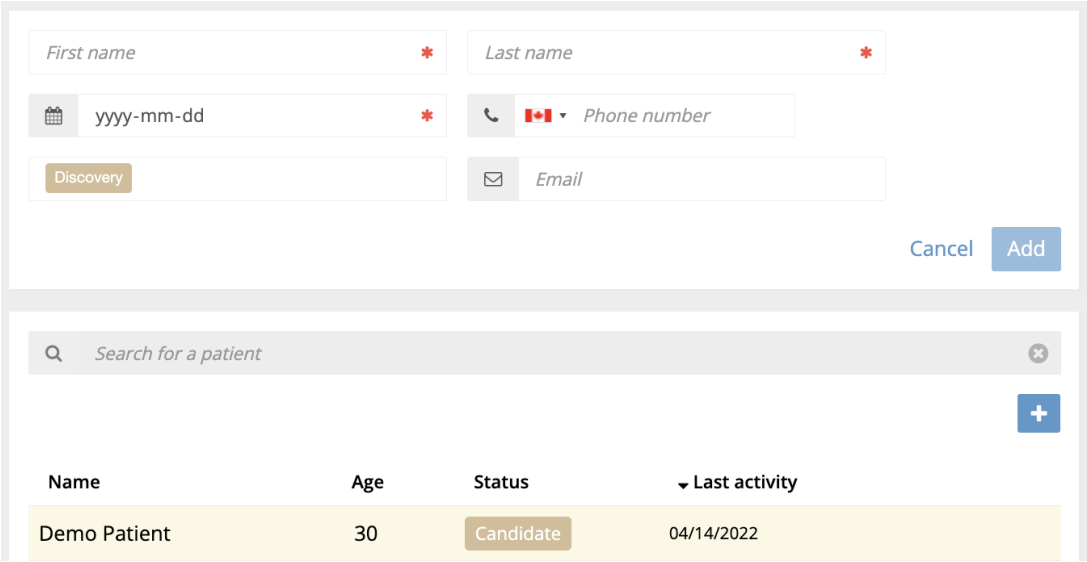
1. From the patient list, click on the **plus** icon 
2. Enter the patient's first name, surname, date of birth (required), phone number, and email (optional)
   ***Note:*** country icon will update automatically upon entering the area code

3. Add a patient's status. There are seven statuses for each patient as follows:

    a. **Discovery:** This is the default status for all new patients
    b. **Normal hearing:** Indicates that the patient has normal hearing. After a test, if the patient's hearing is normal, the status will automatically change to "Normal hearing." They will need to have a Pure Tone Average (PTA) of less than 20 dB at the 500, 1000, 2000 and 4000 Hz thresholds
    c. **Candidate:** Indicates that the patient is a candidate for hearing services. If the patient's PTA for 500, 1000, 2000, and 4000 Hz is more than 20 dB, the status will change automatically to "Candidate."
    d. **Adaptation:** If the patient's folder indicates that the patient uses hearing aids, the status will automatically change to "Adaptation"
    e. **Decline care:** If the patient is a hearing aid candidate but is not interested in hearing aids or hearing services, the examiner can change the status to "Decline care" in their patient file

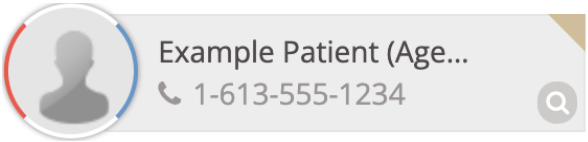
f. **Waiting:** If the patient wants to wait before they buy hearing aids, the examiner can change the status to "Waiting" from the patient file
g. **Success:** If the patient bought hearing aids or is receiving hearing services, the examiner can change the status to "Success" from the patient file

4. Click on the **Add** button to add the patient




## Setting your Active Patient

When you hover over and click on a patient entry in your patients list, that patient will be selected as your current "active" patient. The patient panel at the top of your screen will change to indicate that the patient you have selected is now the current active patient.




This means that:

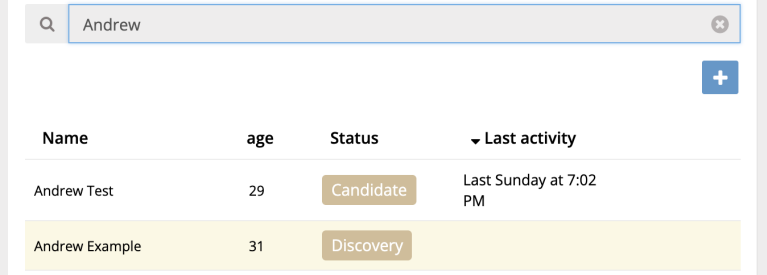
- The Patient Folder page will display the data of your current active patient
- All tests performed will be performed on the current active patient

Ensure that the correct patient has been selected as active before beginning testing.

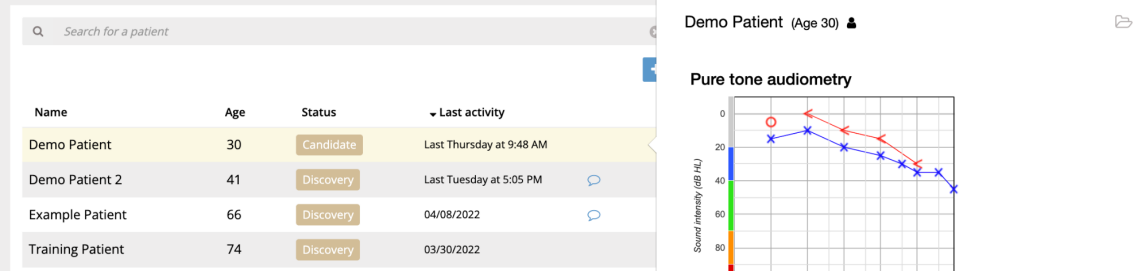
# Searching for Existing Patients & Viewing Results

To search for an existing patient and view their results:

1. Enter the patient's first name, surname, or status in the search bar




2. Hover over the patient and click on the **magnifying glass** to see a basic overview of the patient's results




3. Click on the patient's name or click on the **folder** icon to open the patient's full results from the patient folder

***Note:*** You can check the last time the patient was tested under the last activity column in the patient list. You can also filter the list based on a column criteria of your choice by clicking on the column header. The arrow will indicate if the list is being filtered in ascending ▲ or descending ▼ order.

# Administrator Role

Every center requires at least one user with the Administrator role. The administrator has the ability to manage users (non-admin and admin), add new users, and view their activities. Most of these administrative actions are performed on the **Configuration** page.

The Configuration page allows you to manage information about the users in your center.

***Note*:** Some administrative actions will require you to enter your password.

## Administrative Actions

### Adding New Users

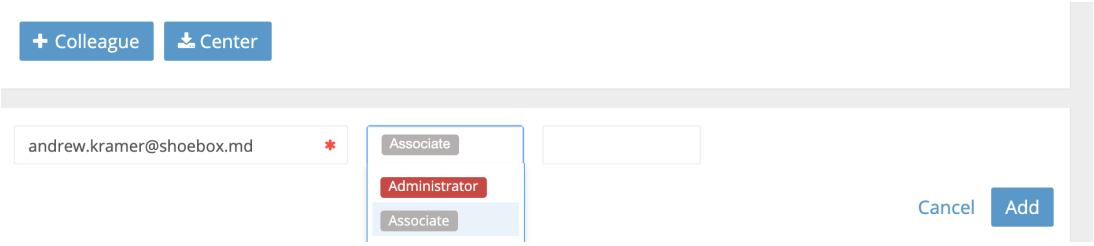
To add a new user:

1. Click on the user panel to access the configuration page
   ***Note:*** you can also access this page by clicking on **Configuration** in the main menu
2. Click on the **+Colleague** button
3. Enter the colleague's email address
4. Identify the colleague's role: Administrator or Associate
5. Click on **Add**









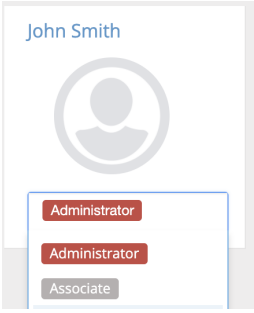

***Note:*** The new user will receive an invitation via email and will be added to your center once they accept the invitation. If the new user informs you that the email has not appeared in their inbox, instruct them to check their spam folder.

## Managing Users

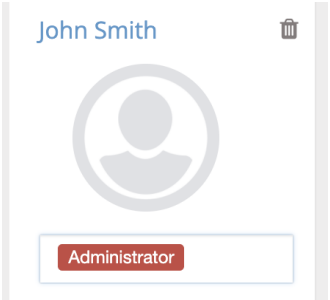



1. Click on the **User Panel** to access the Configuration page or click on **Configuration** in the main menu
2. In the user list on the bottom left, locate the user you would like to manage
3. You can perform the following actions:

    a. Change the user's role using the drop down menu
    ***Note:*** this action will require you to enter your password




    b. Delete a user from your center by clicking on the **trash can** icon. This action will be visible for admin users in the activity feed. An email is also sent to the user that was removed, as well as all admin users in the center.



## Downloading Center Data

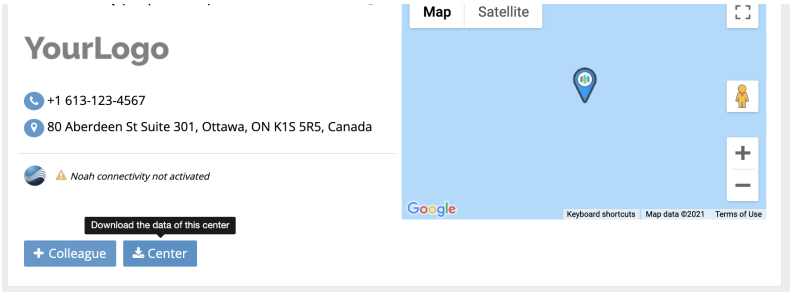
The Configuration page allows you to download CSV lists of a Center's data, including both patient information and test data.

To download center data:

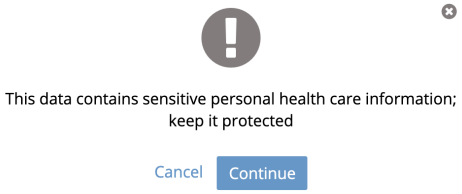
1. Click on the **user panel** to access the configuration page or click on **Configuration** in the main menu



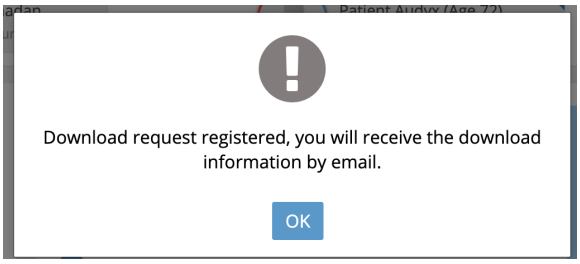

2. Click on the **Center** button




3. Because the CSV contains personal health information, a data sensitivity warning message will pop up. Click on **Continue**




4. Enter your password in the prompted window
5. Another window will pop up to inform you that you will receive the data via email. Click on **OK**

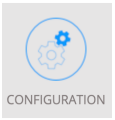



The email you receive will provide you with a link to download the center data in CSV format.

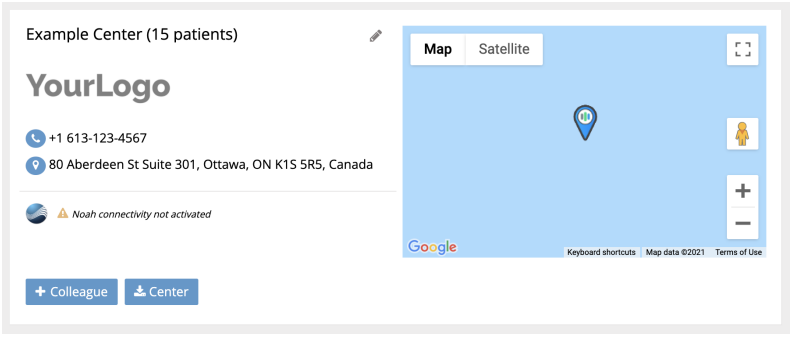
***Note:*** if you are not signed in to the platform, you will be asked to authenticate before you are able to access these files.



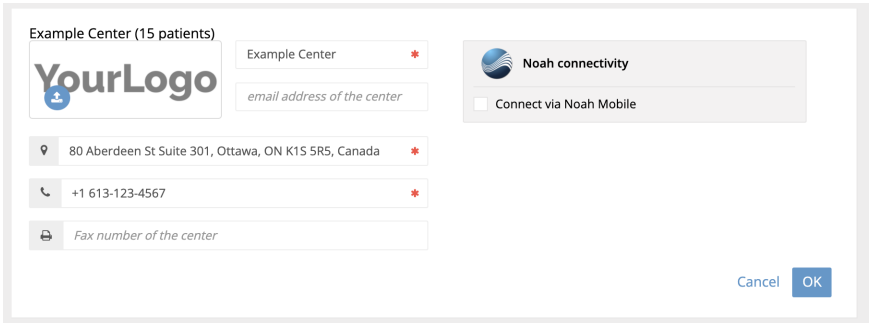

## Modifying Center Information




1. Click on the **User Panel** to access the Configuration page or click on **Configuration** in the main menu
2. Hover over your center's profile, and click on the **Edit** icon that appears next to your center's name




3. Enter/edit the center's name, address, and phone number (required)
4. Enter/edit the center's logo, fax number and email address (optional)
5. Click on **OK**



# Noah Integration

This feature allows organizations that use Noah to synchronize their Noah database with their center on the SHOEBOX Platform.

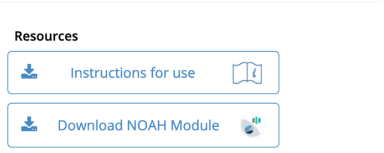
***Important***:

- Ensure the name used on your Noah profile matches the name of your center, to prevent any errors.
- Noah can **only be installed on Windows.**

## Installation and Configuration

### Installing SHOEBOX Module in Noah

1. From the main menu, click on the **Support** icon
2. Click on **Download NOAH Module**

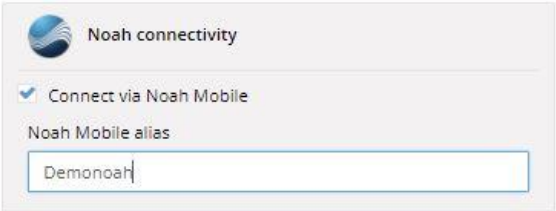



3. Enter your username
4. Enter the center which the patient data will be imported to

### Transferring Data

To transfer data from center to your Noah server:

1. Create a Noah Alias on your server
2. Activate the Noah mobile access from the Noah Interface
3. Enter your Noah Alias on the configuration page



Another page will then open to connect the accounts. Once SHOEBOX and Noah are connected, you will be able to sync each of your individual Noah patients into the SHOEBOX Platform. Conversely, when a patient's file is updated on the SHOEBOX Platform, the changes can be synced to Noah.

***Note:*** The Noah icon on the SHOEBOX platform will display a red lock symbol  if your data failed to transfer. This occurs if the connection to Noah is interrupted, which can be caused by an unstable internet connection, or a Noah server outage.

# Plugin Features

Once the module has been installed in Noah, three buttons labeled, "Koalys" will appear in your Noah interface. Each of these buttons performs a unique feature related to integrating your existing Noah account with SHOEBOX.

### Opening the SHOEBOX Platform from Noah




This button (see right) will open the SHOEBOX Platform in your browser. Before clicking you **must have a patient selected in Noah first**. Once clicked, it will open the selected patient's folder in the SHOEBOX platform.

### Syncing Data




When you perform a test or update a patient's folder on the SHOEBOX platform using Noah Mobile, your data will automatically sync with Noah. If you are not using Noah Mobile, or you want to perform a manual sync, you can click on the sync button (see right). Note that you **must have a patient selected in Noah before performing a sync**. Once clicked, all data for this patient will be immediately synced between your center and your Noah database. It is **recommended to perform manual syncs after updating a patient's data** to ensure the data is synced between the two platforms.

### Changing Centers and Switching Users




The last of the three buttons in your plugin will allow you to change your active Center. This is also where you will go to log out if you need to change which user is currently logged in.

# Profile Configurations

Profile configuration is available to all users, regardless of role.

## Profile Setup

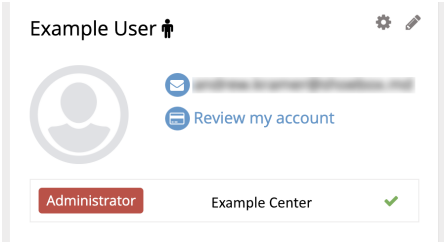
### Editing Your Profile

To edit your profile:

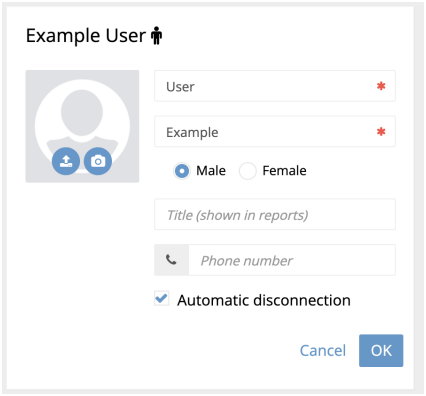
1. Click on the **user panel** to access the configuration page
   ***or*** click on **Configuration**
   in the main menu




2. Hover over your entry in the user list and click on the **edit** icon




3. Edit your first and last name (required)
4. Edit your gender, title, phone number and profile picture (optional). You can also enable automatic disconnection, which will auto-logout after 30 minutes of inactivity for your user.



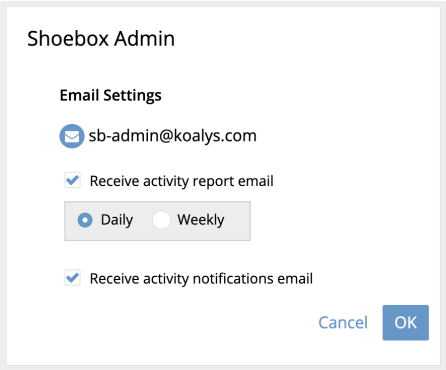

5. Click **OK**

## Changing the Email Settings

Email settings help with center management by providing an easy way to keep track of activity on your center.

To change the email settings:

1. Click on the **Settings** icon
2. Check the boxes for the notification emails you would like to receive, and select if you would like to receive an activity report email daily or weekly.
3. Click **OK**




**Activity Report Email:** This is a summarized report of all activity that has taken place in your center and on Noah if your center has a linked Noah account. It can be configured to be a daily report or a weekly report.

**Activity Notifications Email:** These are alert emails that send automatically whenever a new activity has occurred in your center. For example, if a test was completed, or if center data was downloaded.

## Changing the Center

If you work in more than one center, you can easily switch between them. This allows you to use one login for your users in different accounts or centers.

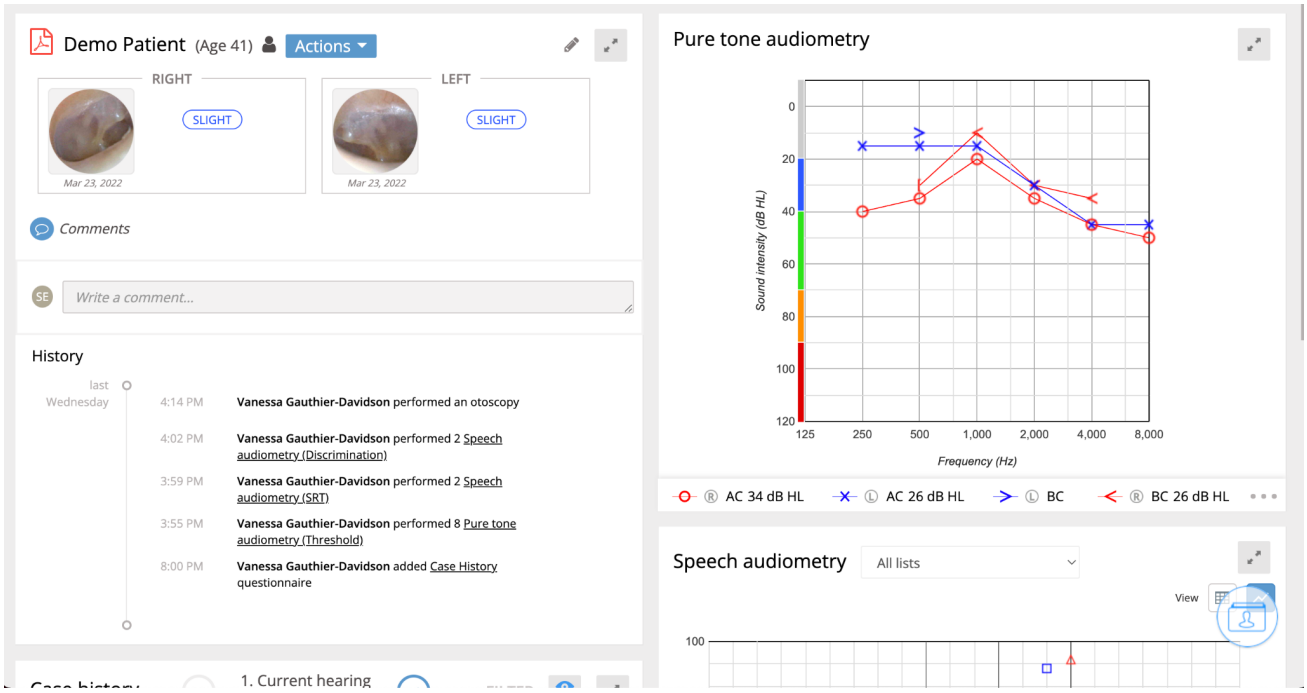
To change the center:

1. Click on the **user panel**
2. From the center's list, hover over the center that you want to activate
3. Click on the **arrow** icon

***Note***: Changing centers will also change the patient list, the user list, and the center's data.

# Patient Folder

The patient folder contains a complete summary of all of a patient's data.




You can expand or condense the view of each patient folder section by clicking on  or 

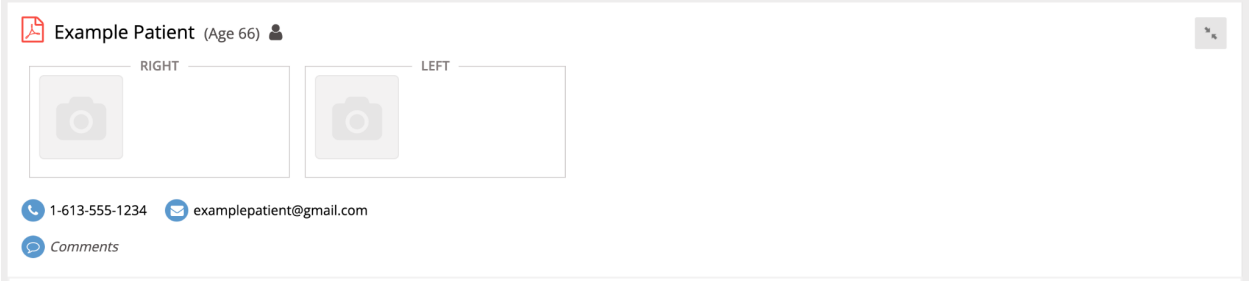
You can use the folder menu on the bottom right hand side of the page to navigate through the various sections of the Patient Folder.

Hover over the folder icon  to open the folder navigator. You can quickly jump between each section of the patient's folder, as well as add the patient's case history and fitting information.



***Note:*** Only the tests that were performed for the patient will be displayed in the navigation section.

# Patient Information




This section includes:

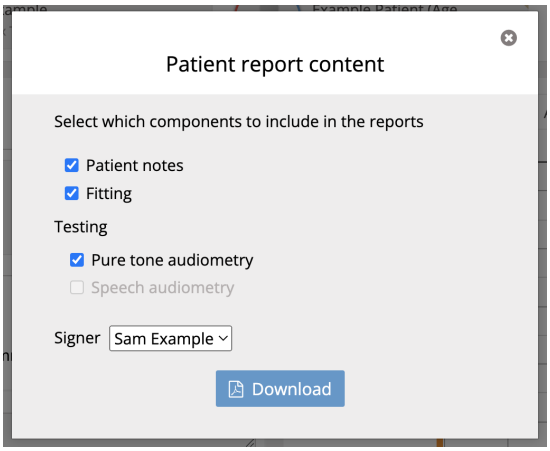
- The patient's name, age, gender
- The patient's otoscopy photos with hearing level indicators if available
- The patient's hearing aids make and model (as retrieved by Noah)
- The patient's contact information
- Any additional notes or comments about the patient. These comments will appear in the patient report

Additionally, clicking on the PDF icon will allow you to generate a PDF report of the patient's results.

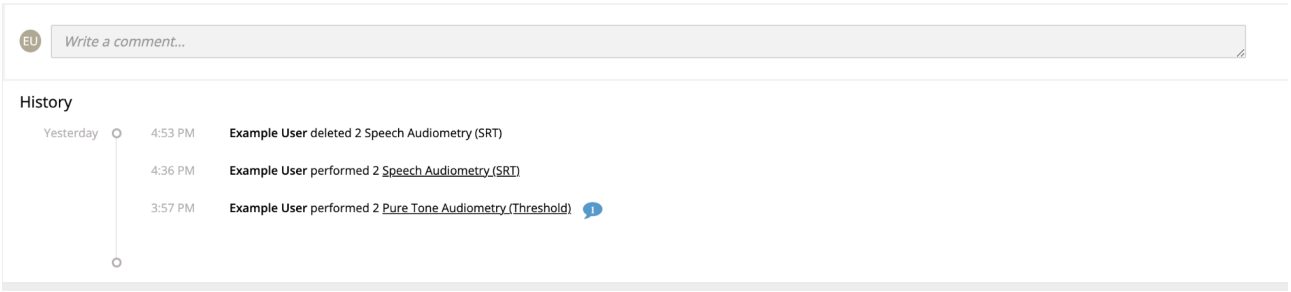
## Generating a Report

To generate reports (in PDF format) from the patient file:

1. Click on the **PDF file icon** to the left of the patient's name
2. Select the components that you want to include in the report
3. Select your name from drop-down menu
4. Click on **Download**



# History




This section includes:

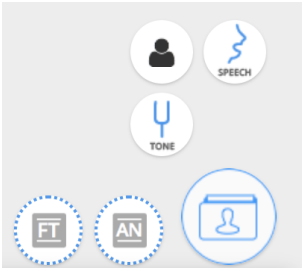
- A full, comprehensive history of the patient activities The date and time of each test
- The type of test that was performed with the patient
- The source platform (SHOEBOX or Noah)
- The user that tested them
- If a user deleted a patient's test data, the date and time when the user deleted the test data and the name of the test that was deleted

All history activities are listed in chronological order, the most recent being at the top of the list. Click on the  icon to view more of the patient's history.

You can manually add an activity to the list using the "Write a comment..." bar above the patient's history. Type in the event as a comment, then click on **Save** to save it to the patient's history.

# Case History

This section contains a full summary of the patient's case history based on their questionnaire responses and notes. The different sections of the case history allow for a variety of use cases, and all fields are optional. Click on the expand icon to access a search bar to quickly look up key questions that relate to your patient. All content will be saved automatically when added.




If there is no case history for the patient, you can create one by clicking on 

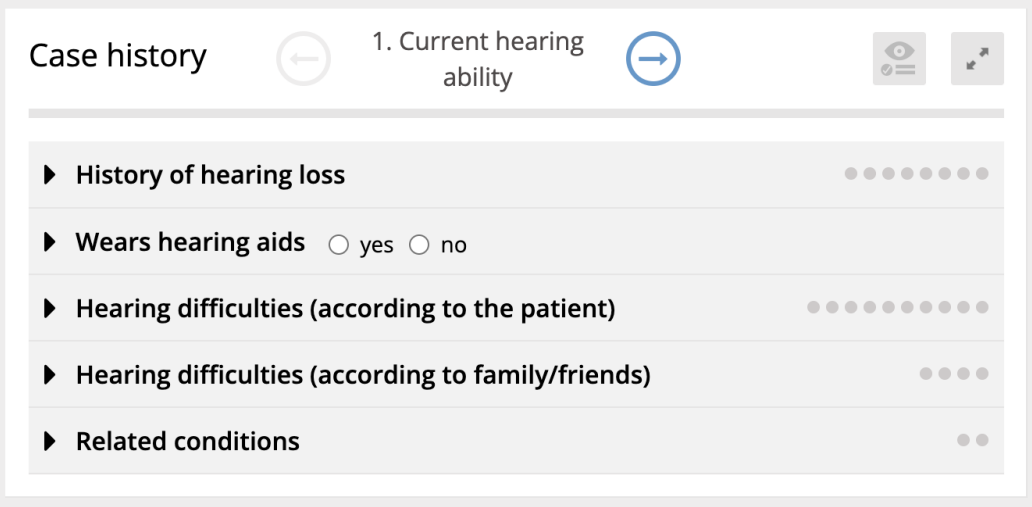
in the patient folder navigator.

All sections of a patient's case history can be manually edited at any time, if necessary.

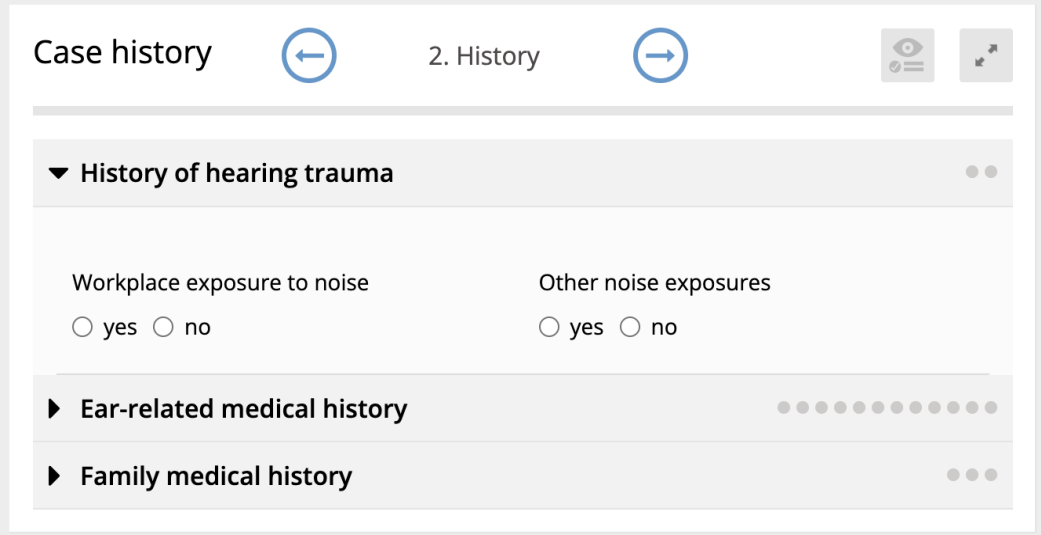
There are four subsections in a patient's Case History, each will be displayed below in a condensed view. In the condensed view, click on the arrows to switch between case history sections. If viewed in expanded mode, all the sections will be displayed on the screen.

Clicking the Eye icon will filter the Case History to only show answered fields.

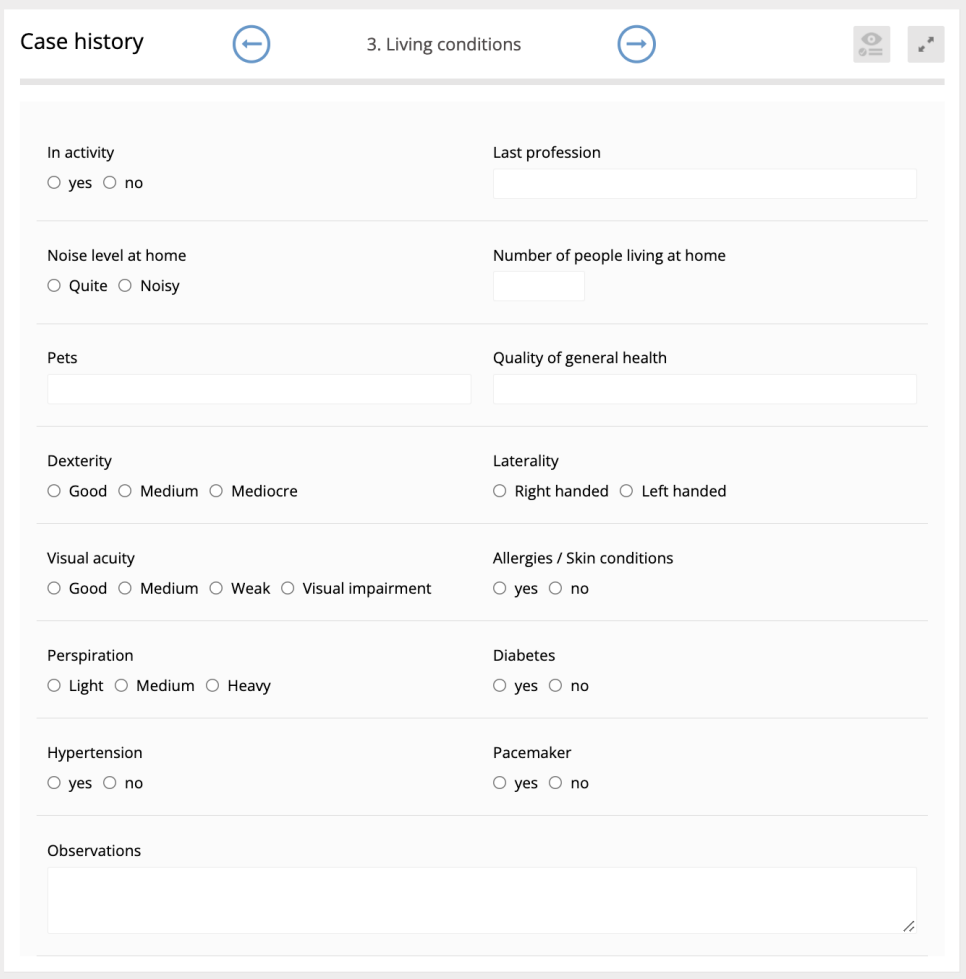
1. State of Hearing Abilities: contains various categories of hearing ability questions and ear-related disorders.



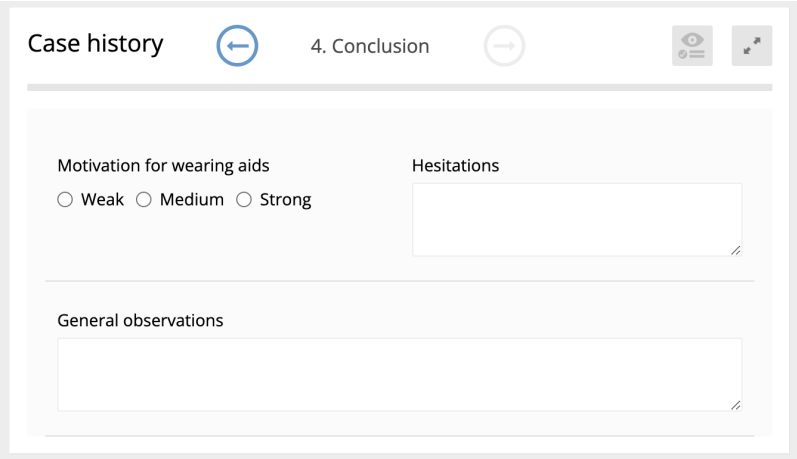

2. Medical History: contains information about medical history, including previous noise exposure, ENT history, and family medical history.



3. **Living Conditions:** contains information about current living conditions




4. **Conclusion:** Hearing care professionals notes and observations

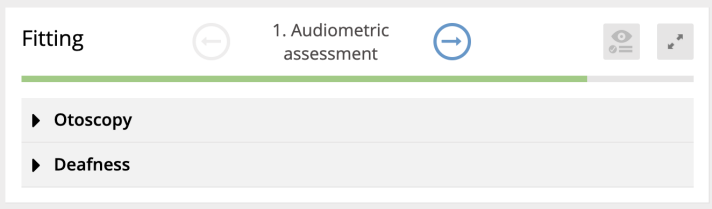


# Fitting

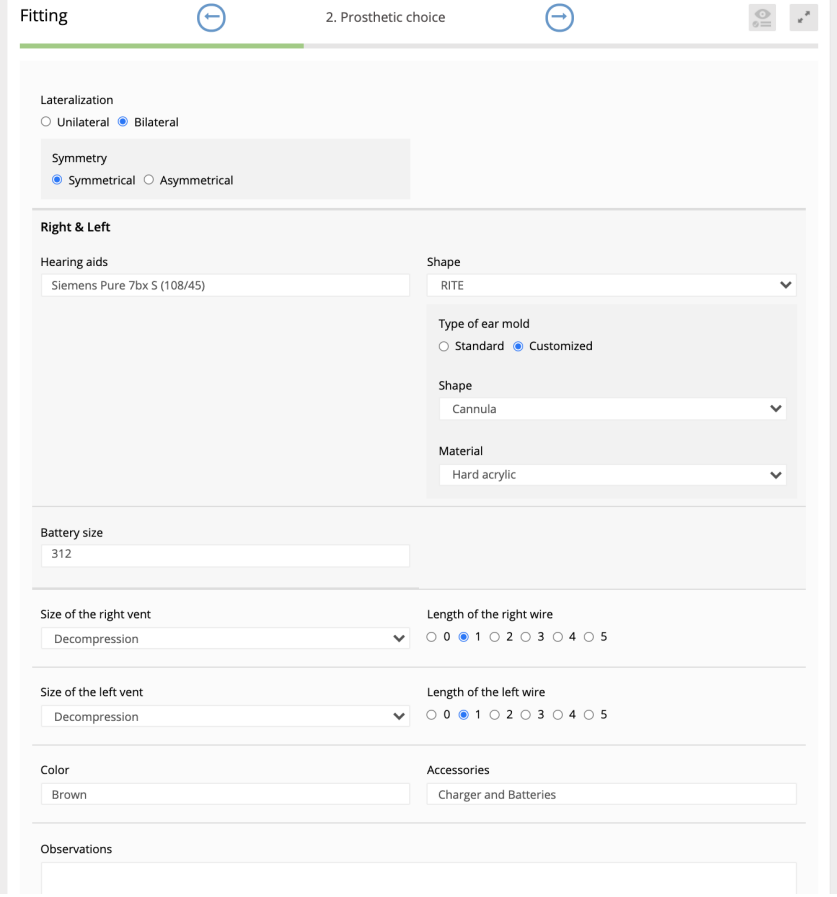
If the patient has been or will be fitted for hearing aids, this section contains data pertaining to their fitting process.

The Fitting section is divided into four subsections, each will be displayed below in condensed view.

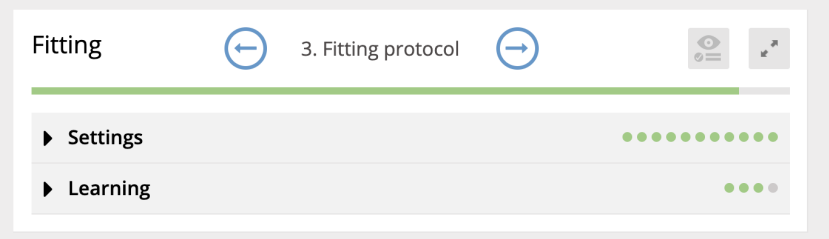
1. **Audiometric Assessment:** otoscopy results and a summary of their hearing diagnosis.



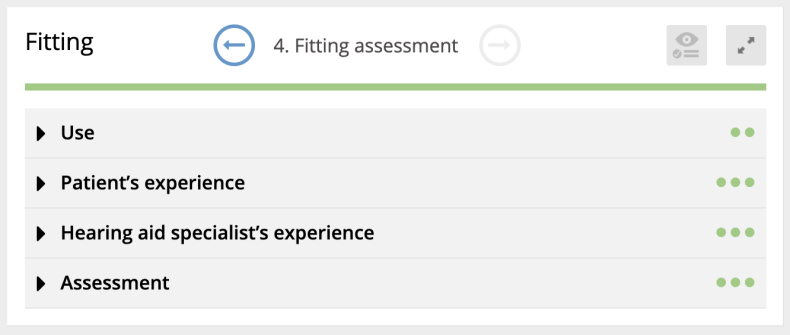

2. **Hearing Aid Choice:** a full description of the patient's hearing aid(s).



3. **Fitting Protocol:** contains information regarding the patient's hearing aid settings and the patient's level of knowledge related to the use of their hearing aid.




4. **Fitting Assessment:** contains feedback about the patient's experience with the hearing aid, notes on the patient's adjustments, satisfaction, limits and experiences shared using the hearing aid.




# Audio Setup

Before you test a patient, you will need to use the Audio Setup page to configure a booth that you will be using. The booth will remember the configuration of your testing hardware, to streamline the testing experience.

## Setting up your booth

1. Access the Audio Setup page by clicking on the **Audio Setup** icon 

in the main menu

2. Click on the "plus" icon  to add a new sound booth

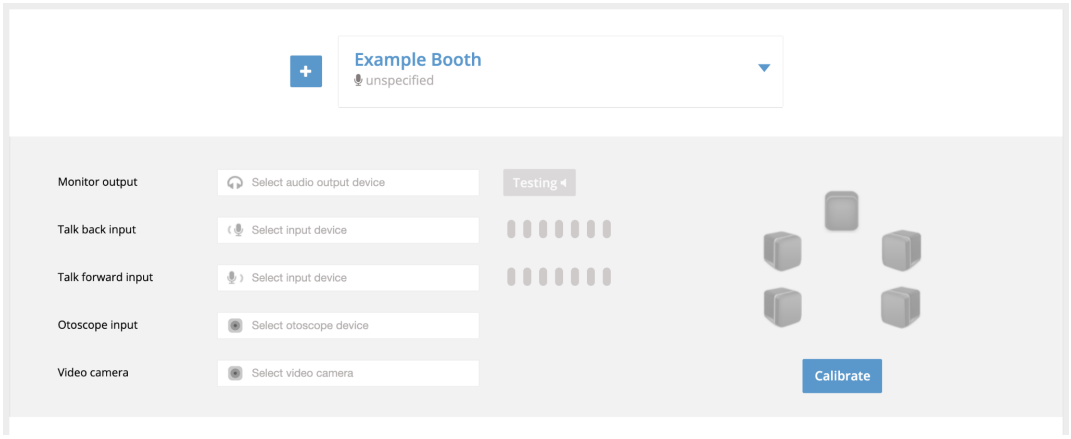
3. Give your sound booth a name, then click the **Create** button 



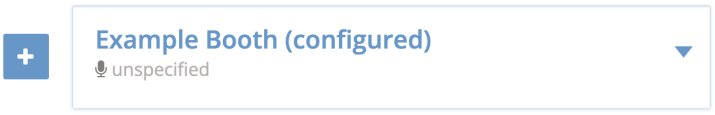


4. Use the drop-down menus on the left to select the hardware that will be used for each test.

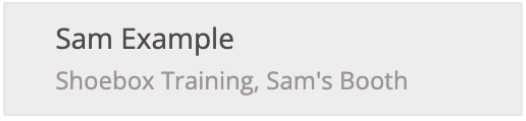
    a. **Monitor output:** the headphones/speakers used by the clinician to hear presented tones/words
    b. **Talk back input:** the microphone used for talk back
    c. **Talk forward input:** the microphone used for talk forward
    d. **Otoscope input:** the otoscope used for otoscopy
    e. **Video camera:** the camera used for video conferencing (if applicable)




Once all hardware has been selected, the booth's status will change to (Configured) and you will be ready to begin testing using this sound booth.




***Important:*** if your center will contain multiple booths, always check the user panel on the top of the page to make sure that you have the correct booth selected before beginning a testing session. We recommend naming your booth something easy to remember and distinguishable from any other booths in your center.



# Setting up Free-Field

If your center is planning on conducting free-field testing, there are a few extra steps you will need to perform before moving on.

While still on the audio setup page, access the Free-Field calibration menu by clicking on the **Calibrate** button beneath the image of the free-field speakers on the right.




### Step 1: Microphone calibration

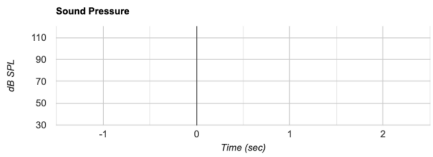
a. Enter the serial number of your microphone into the serial number bar on the left of your screen

b. Click on the **checkmark** icon 










### Step 2: Output (Speaker) Calibration

a. Select your speaker from the **Audio Output Device** drop-down menu

b. Select your booth configuration under **Setup**: stereo for two speakers, or multichannel for five speakers
c. Position the microphone vertically at the same level as the middle of the patient's head inside the booth
d. Click on the Test button to test the signal. If successful, the test will automatically continue to Step 3



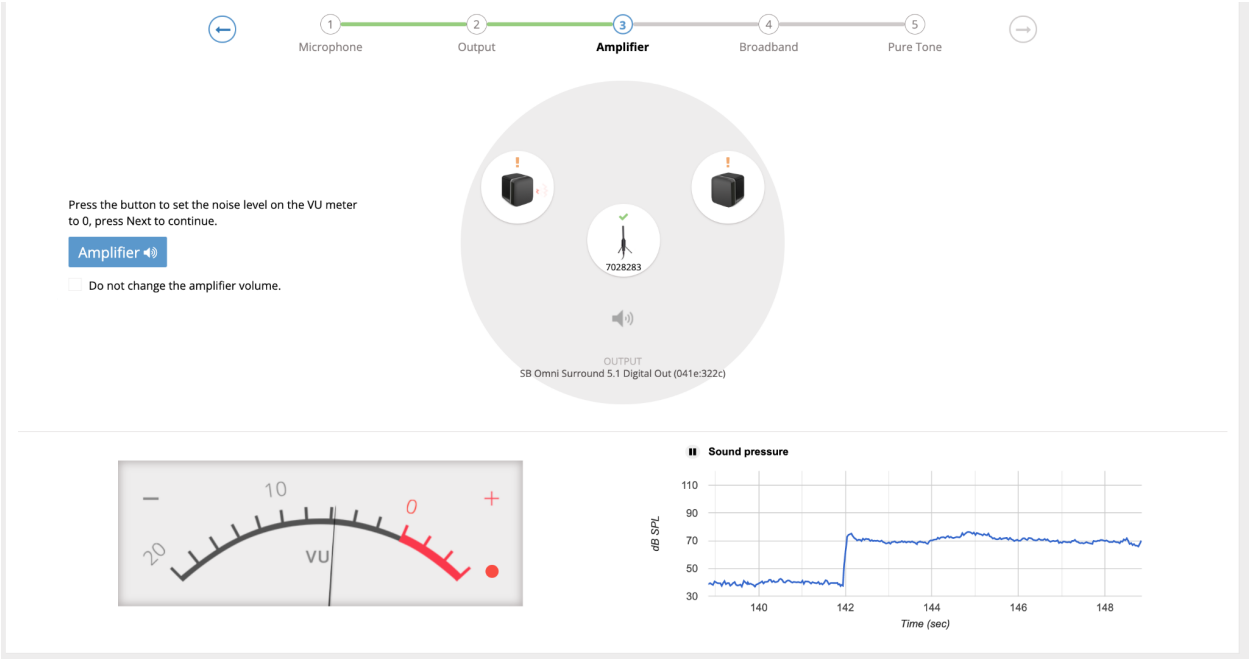

## Step 3: Amplifier Calibration

***Note:*** To skip this step click on "Do not change amplifier volume."

a. Click the **Amplifier** button Amplifier
b. Set the amplifier level until the needle of the SLM (Sound Level Meter) at the bottom left reads zero
c. Wait for a few seconds at level zero and you will automatically be prompted to the next step

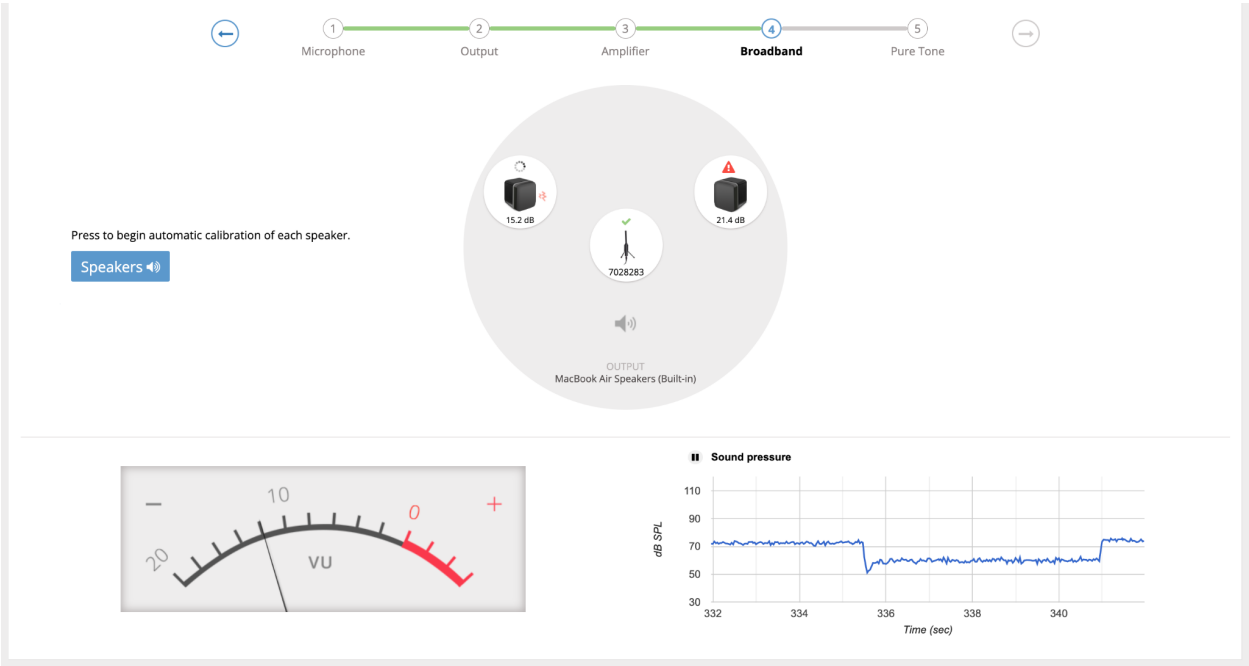
***Important:*** Once it has been set, the amplifier volume must not be changed as the cabin calibration might be lost. It is advisable to note the value of this setting clearly on the amplifier.

***Warning!***: Increasing the amplifier level could cause your patient permanent auditory damage by potentially exposing them to very high sound intensities.



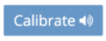

## Step 4: Broadband Calibration

a. Click the **Speakers** Speakers button to begin the automatic calibration process of each speaker. You will automatically be prompted to the next step upon completion



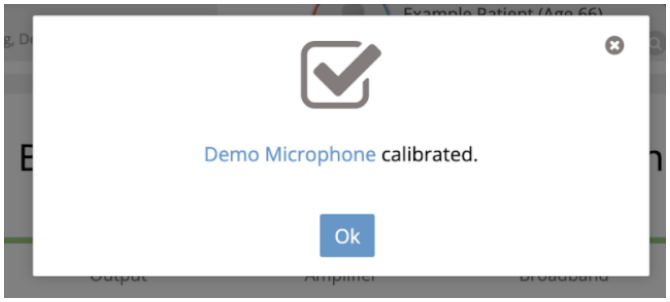
## Step 5: Pure Tone Calibration

a. Select the speaker to perform pure tone calibration on, **Left** or **All**

b. Click the **Calibrate**  button to begin the automatic calibration process of the selected speakers



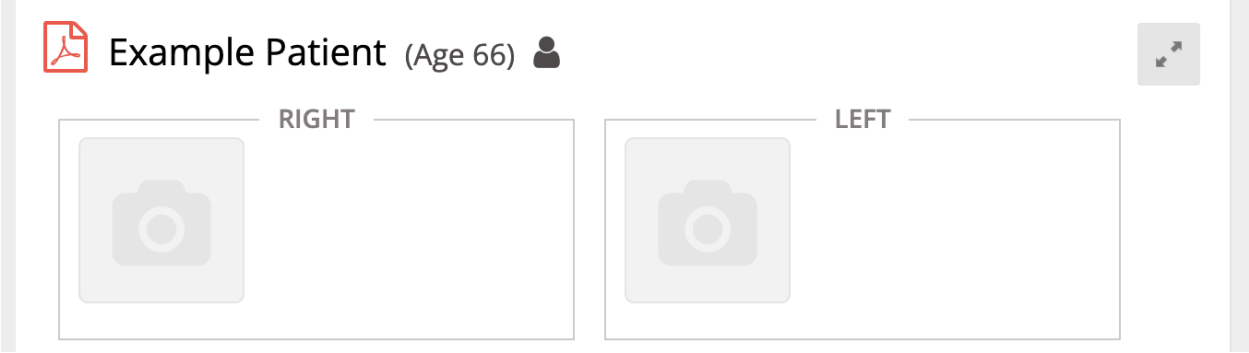
Once the calibration process is completed, a message will indicate that your booth is now calibrated.



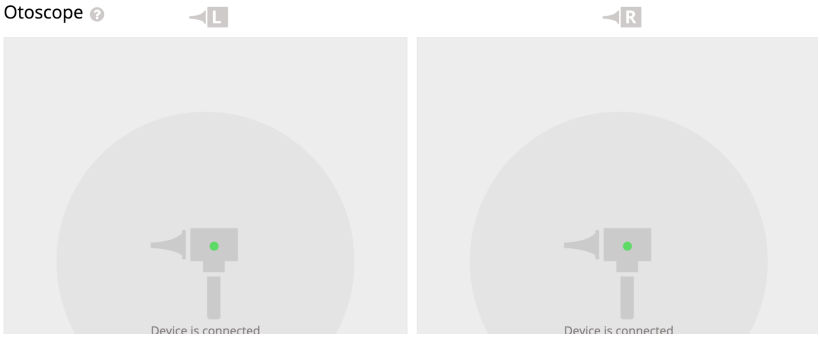
# Otoscopy

From the main menu, click on the **Otoscope** icon 


***Note:*** You can also access the otoscope page from the patient folder by clicking on the camera icons for the right or left ear. (See image below)



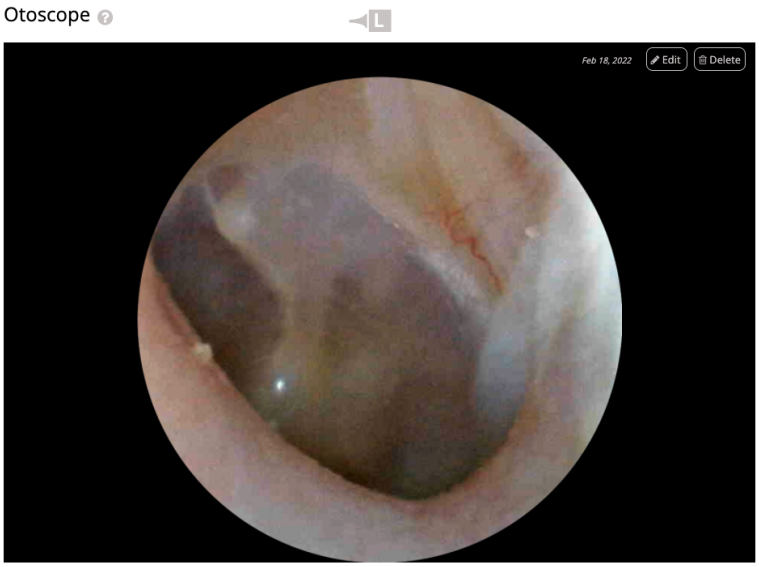

1. Click on the right (R) /left (L) otoscope icons to open the camera



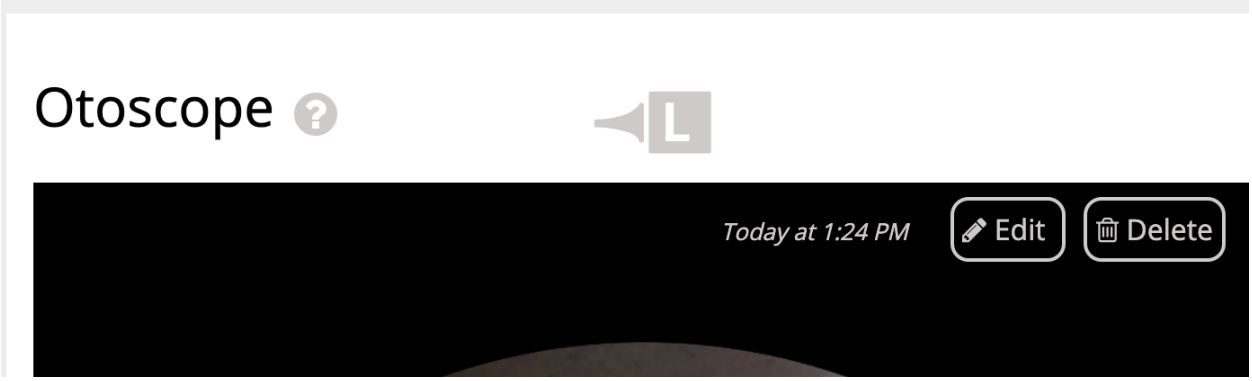

2. Click on **Capture** to capture the image



3. Click on **Save** to save the image to the patient file
   ***Note:*** You can also crop the image and save the edited version.




To delete or edit the image after you saved it, click on the **Delete** button or **Edit** button respectively.




***Note:*** click on the question mark to view the keyboard shortcuts for the otoscope page. (See page 74 for an overview of keyboard shortcuts)

# Pure Tone Testing

## Accessing the Pure Tone Test

**To access the pure tone test page:**

1. Click on **Test Menu** 

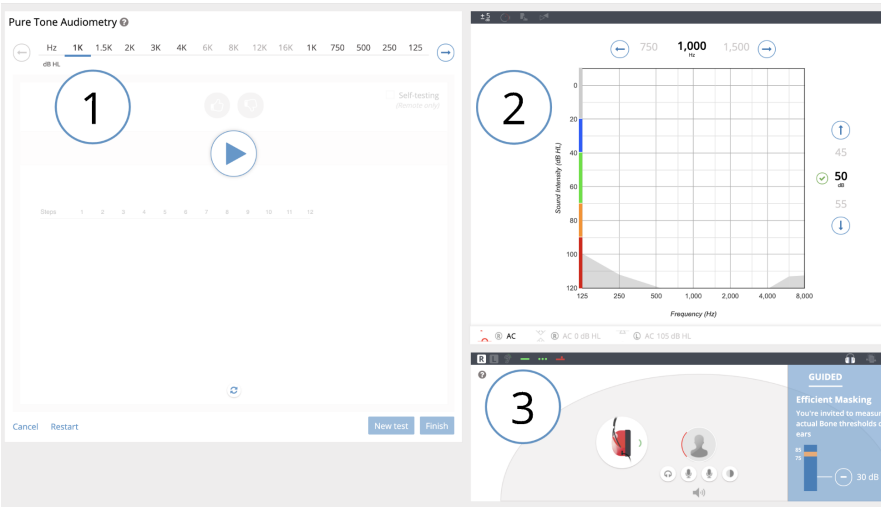
to select a test type
2. Select the tonal test by clicking on the **Pure Tone test** icon 

***Note:*** If your audio setup is not completed, you will be taken to the audio setup page to complete the setup instead of being taken to the test page.

## Navigating the Pure Tone Test Page

The Pure Tone Test page is divided into **three** sections:

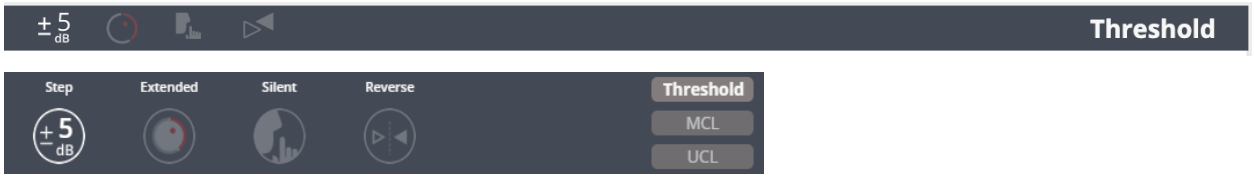
1. **Monitoring Panel:** Used to control automatic testing, and to provide an at-a-glance look at the patient's responses to each frequency.
2. **Manual Testing Panel:** Used to control manual testing, and to provide a view of the thresholds obtained for each frequency.
3. **Test Control Panel:** Used to control the function of the patient's transducers during the test, I.E. switching ears, changing the transducer type, applying masking, activating talk forward etc.



# Completing a Pure Tone Test

## Setting up the test

1. From the audiogram panel, click on the **black bar** to open the test settings




2. Select the test type. There are three test types to choose from:

    i. **Threshold Test**: A test that identifies the patient's hearing thresholds
    ii. **MCL (Most Comfortable Level)**: A measure that identifies the most comfortable sound level for the patient
    iii. **UCL (Uncomfortable Level)**: A measure that identifies the loudest sound level that the patient can tolerate

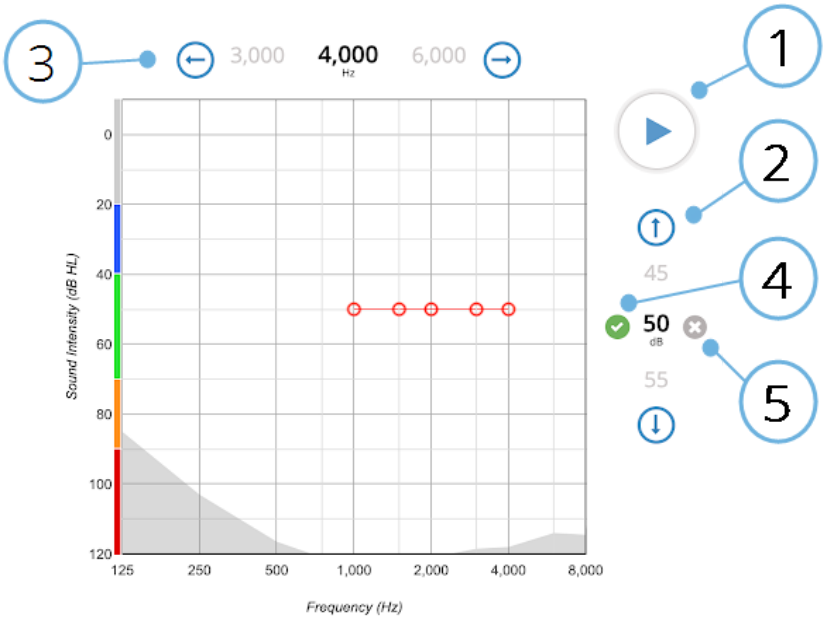
3. Click on the **Step** icon to change the steps in decibels to +/- 1, 2 or 5 decibels
   ***Note:*** the default step is +5dB, but you can change it to +2dB or +1dB

4. Click on the **Extended** icon to test frequencies above 100 dB (decibels)
   ***Note:*** the default settings deactivate intensities above 100 dB for possible safety concerns.

## Starting the Test in Manual Mode

By default, you will be testing the right ear first, indicated in red on the audiogram.

1. Press **space** on your keyboard to present a tone at the desired frequency and intensity or use the **play** icon in the control panel
2. To change the sound intensity (dB HL), click the **up/down arrow** on your keyboard or click on the **up/down arrow** icons
3. To change the frequency, press on the **right/left arrow** on your keyboard or click on the **right/left arrow** icons
4. To save a threshold, click on  or press **Enter** on your keyboard
5. To delete a threshold, click on  or press **Delete** on your keyboard
6. To easily switch between ears press **R or L** on your keyboard

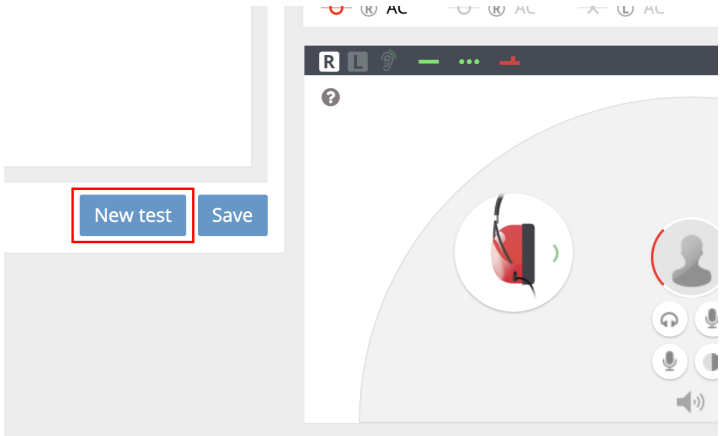



***Tip:*** click on the **question mark** icon above the control panel for a list of helpful keyboard shortcuts. (See page 79 for an overview of keyboard shortcuts)

## Switching Ears

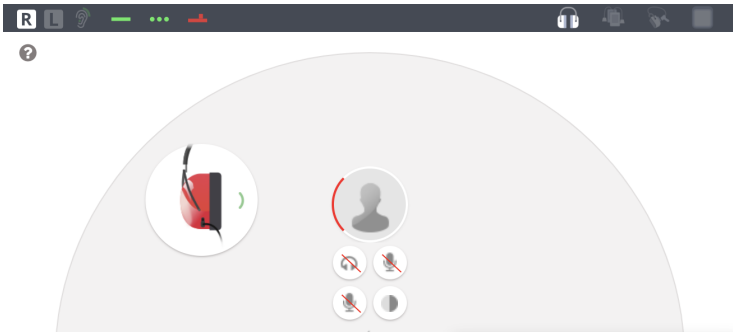
After testing the patient at all desired frequencies in their right ear, clicking on the New Test button will automatically switch ears.

At any point, you can use the test control panel to switch to their other ear. Press the **L** or **R** keys on your keyboard to quickly switch between ears.

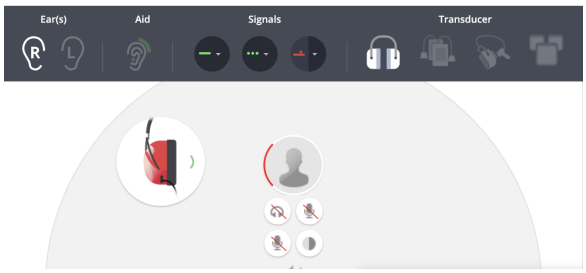


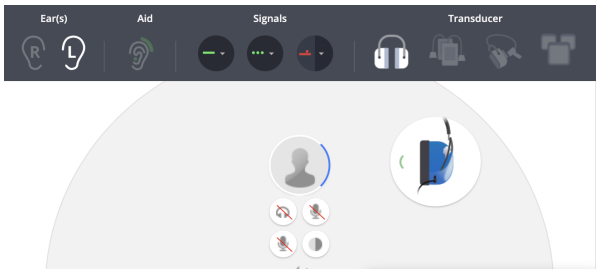
To switch ears manually:

1. Click on the black bar on the top of the test control panel



2. Click on the  icon to switch from the right ear to the left ear, and vice-versa



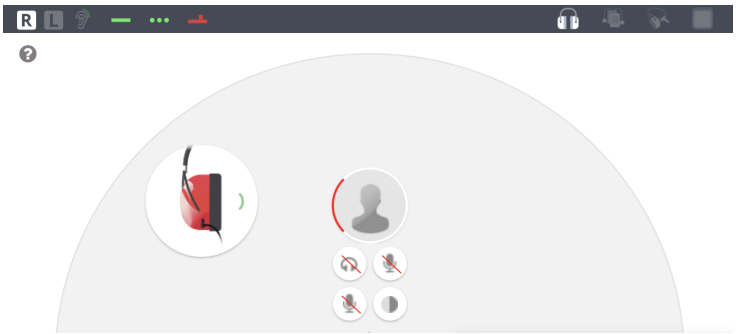




## Switching to Bone Conduction Testing

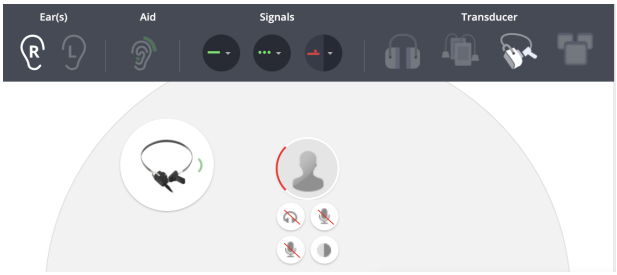
Pressing the Tab key during a test will switch between your installed transducers

To switch directly to your bone transducer:

1. Click on the black bar on the top of the test control panel



2. Click on the bone transducer icon  to switch to bone conduction

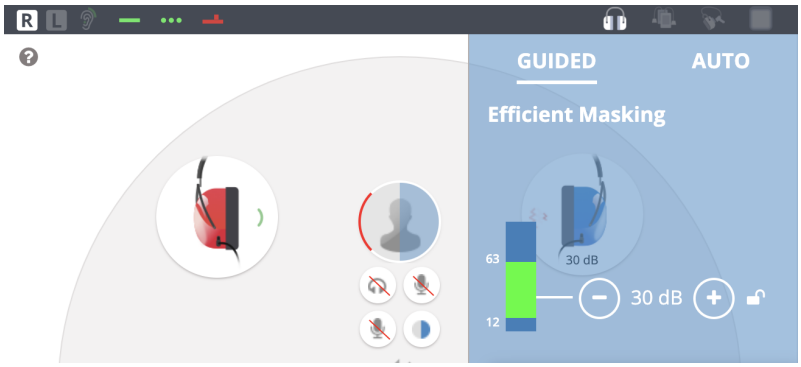



## Applying Masking

1. On the test control panel, click on the **masking** icon or press **M** on your keyboard




2. Click on the **plus or minus** icons to raise or lower the dB level of the masking




***Tip:*** click on the **question mark** icon for a list of helpful keyboard shortcuts. (See page 79 for an overview of keyboard shortcuts)

Masking intensity ranges will vary depending on which transducers are used, which frequency is tested and which type of test is conducted. The pure tone and the masking noise can be synchronized to facilitate the execution of a test with active masking.

To do this, you will need to click on the padlock icon. 

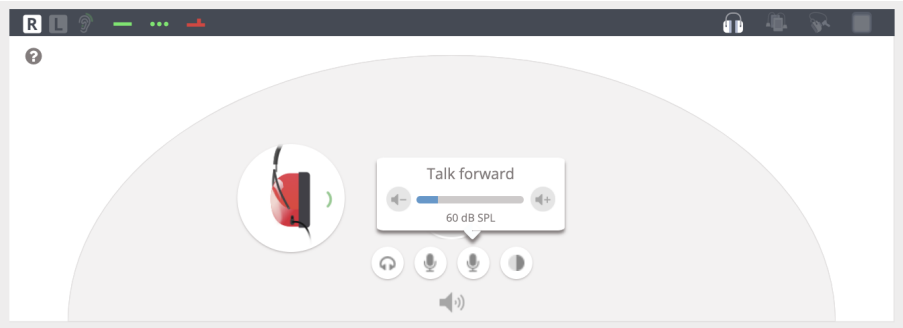
Once the padlock is locked, any variation in the pure tone intensity will affect the masking noise intensity in the same manner.

Using the buttons, you can still adjust the level of the masking without affecting the level of the pure tone being presented. Alternatively, simply click again on the padlock to unlock the synchronization between these two signals.

You can also use masking with the headset when the signal is streamed by bone conduction.

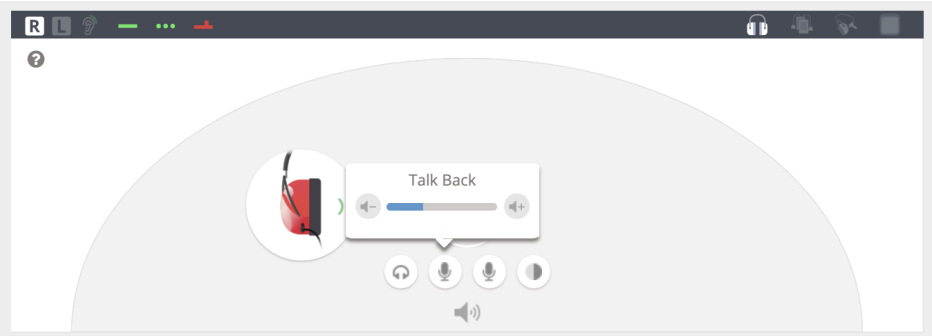
## Talk Forward

1. On the avatar panel, click and hold on the right-hand **microphone** icon or press **T** on your keyboard.
2. The icon will glow blue when held to indicate that talk forward is active. Keep it held while speaking, then release it to deactivate.
3. Adjust the volume accordingly using the volume buttons or keyboard shortcuts




## Talk Back

1. On the avatar panel, click on the left-hand **microphone** icon
2. Adjust the volume accordingly using the volume buttons or keyboard shortcuts



# Speech Testing

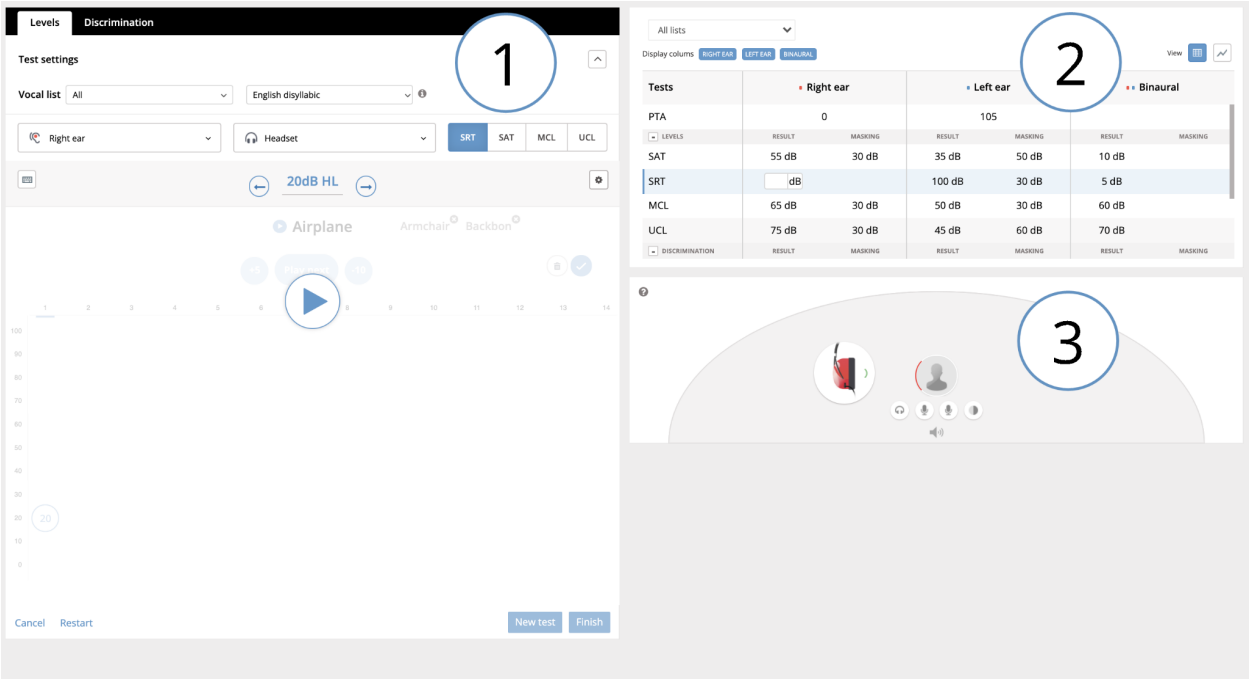
## Accessing the Speech Tests

1. Navigate to the Speech Testing page by clicking on the **Test Menu**
2. Click on the **Speech Test** icon

## Navigating the Speech Test Page

The Speech Test page is divided into **three** sections:

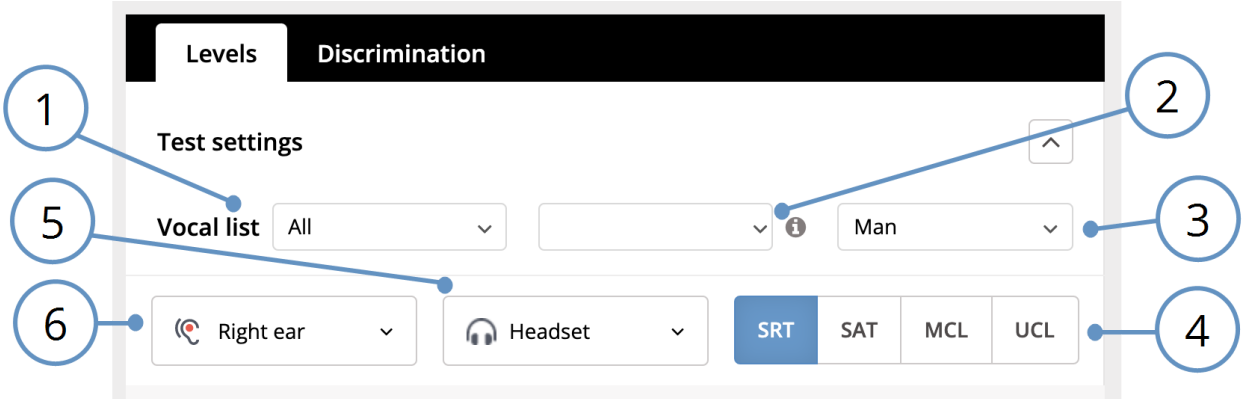
1. **Control Panel:** Used to configure test settings and transducer type, and contains the speech test controls
2. **Results Panel:** Displays the results of each test. Can be displayed in tabular view or graphical view
3. **Test Control Panel:** Used to control the function of the patient's transducers during the test, I.E. switching ears, applying masking, activating talk forward etc.



# Completing a Speech Test

Under the **Levels** tab, configure the speech test's settings before conducting the test.

1. Select the language from the drop down menu
2. Select a list type from the drop down menu (i.e. English Spondees)
3. Select a male or female voice type from the drop down menu (if applicable)
4. Select one of the following test types: SRT, SAT, Speech MCL, Speech UCL
5. Select a transducer from the drop down menu
6. Select which ear is being tested, right or left

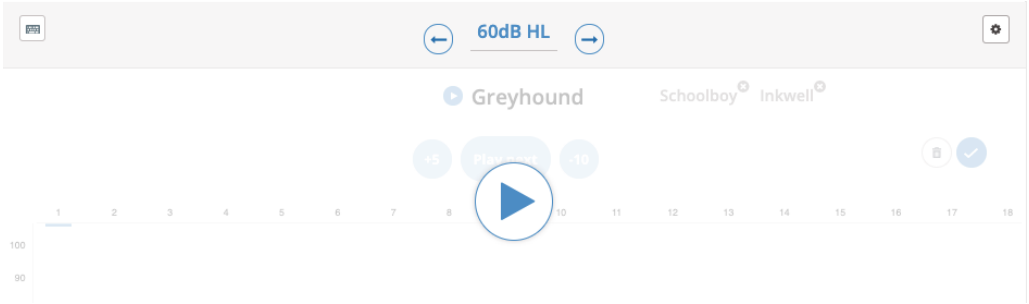



## Starting the Speech Test

Presentation levels can be changed by clicking on the right/left blue arrows 


Clicking on the blue "Play" button  in the middle of the screen will start the test.

Click on the keyboard  icon for a list of helpful keyboard shortcuts. (See page 79 for an overview of keyboard shortcuts)



Easily adjust the presentation levels by using the +5 or -10 icons, which will automatically play the next word. An upcoming word can be skipped by clicking on the small "x" next to it.

To replay a word, click on the play icon to the left of the current word.

To record the final result, click the blue checkmark

If you need to re-measure, first click the trash can icon to delete, then proceed with re-measuring.

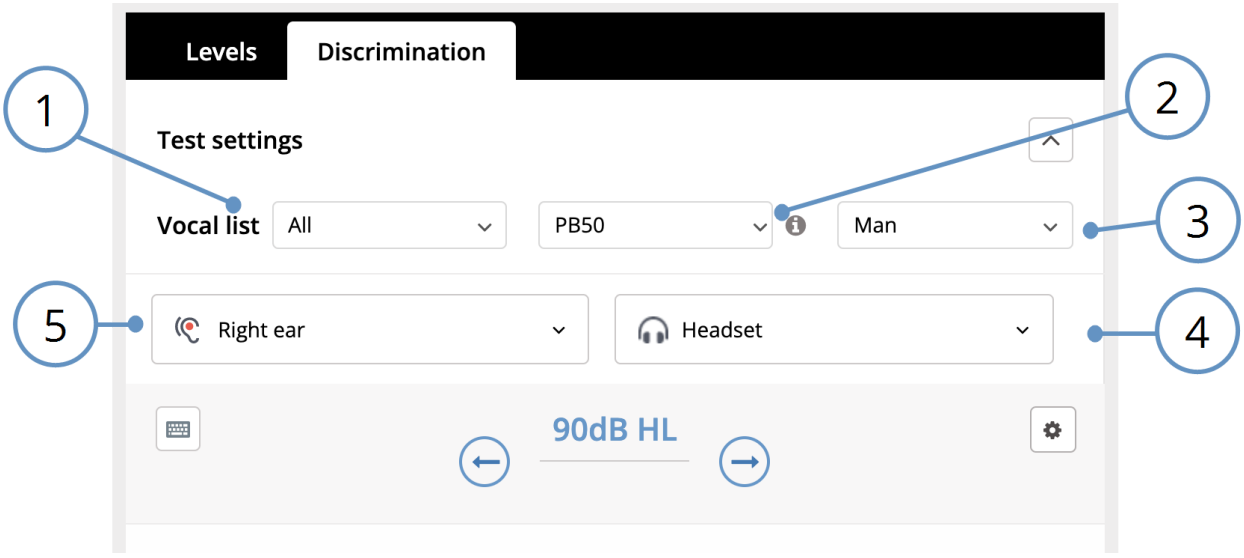
Repeat for the other ear.




## Starting a Discrimination Test

Click on the **discrimination** tab next to the levels tab to switch to the discrimination test interface.

1. Select the language from the drop down menu
2. Select a list type from the drop down menu
   ***Note:*** Some default speech lists do not include carrier phrases (i.e. "say the word")
3. Select a male or female voice type from the drop down menu (if applicable)
4. Select a transducer from the drop down menu
5. Select which ear is being tested, right, left or binaural

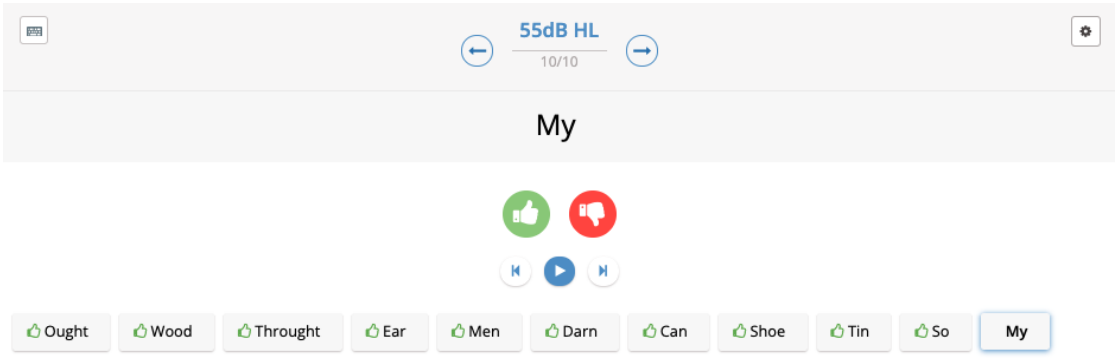


The presentation level can be changed by clicking on the right/left blue arrows 

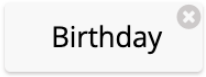

Clicking on the blue “Play” button  in the middle of the screen will start the test.

Clicking on the gear icon  will open the **Step and Auto-Play** menu. Step size can be changed if needed and Auto-Play can be left at the **Levels and items** default.

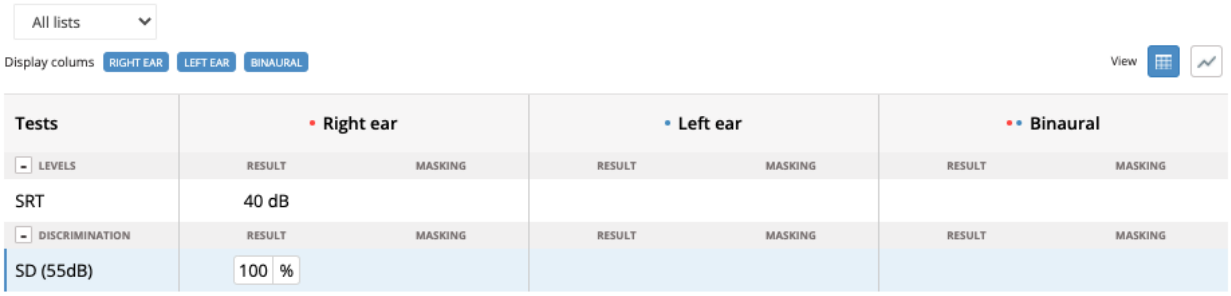
Scoring can be done by using the  and the score will be shown below the presentation level.




An upcoming word can be skipped by clicking on the small “x” next to it. (see example right)




Results will be displayed at the top right corner of the screen and can be seen in a graph or tabular view.

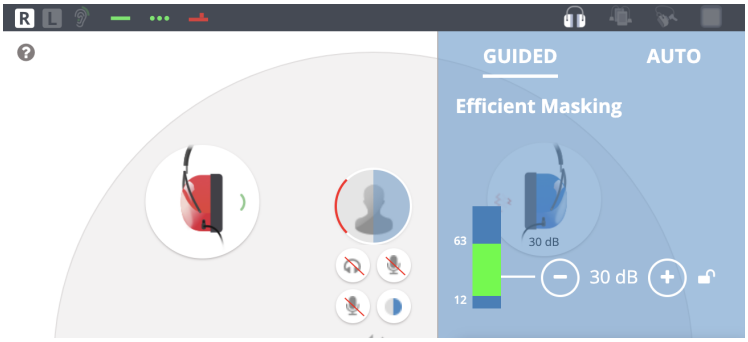


## Applying Masking

1. On the test control panel, click on the **masking** icon or press **M** on your keyboard




2. Click on the **plus or minus** icons to raise or lower the dB level of the masking




***Tip:*** click on the **question mark** icon for a list of helpful keyboard shortcuts. (See page 79 for an overview of keyboard shortcuts)

Masking intensity ranges will vary depending on which transducers are used and which type of test is conducted. The speech test and the masking noise can be synchronized to facilitate the execution of a test with active masking.

To do this, you will need to click on the padlock icon. 

Once the padlock is locked, any variation in the speech test intensity will affect the masking noise intensity in the same manner.

Using the buttons, you can still adjust the level of the masking without affecting the level of the speech test. Alternatively, simply click again on the padlock to unlock the synchronization between these two signals.

# Speech Testing (In Noise)

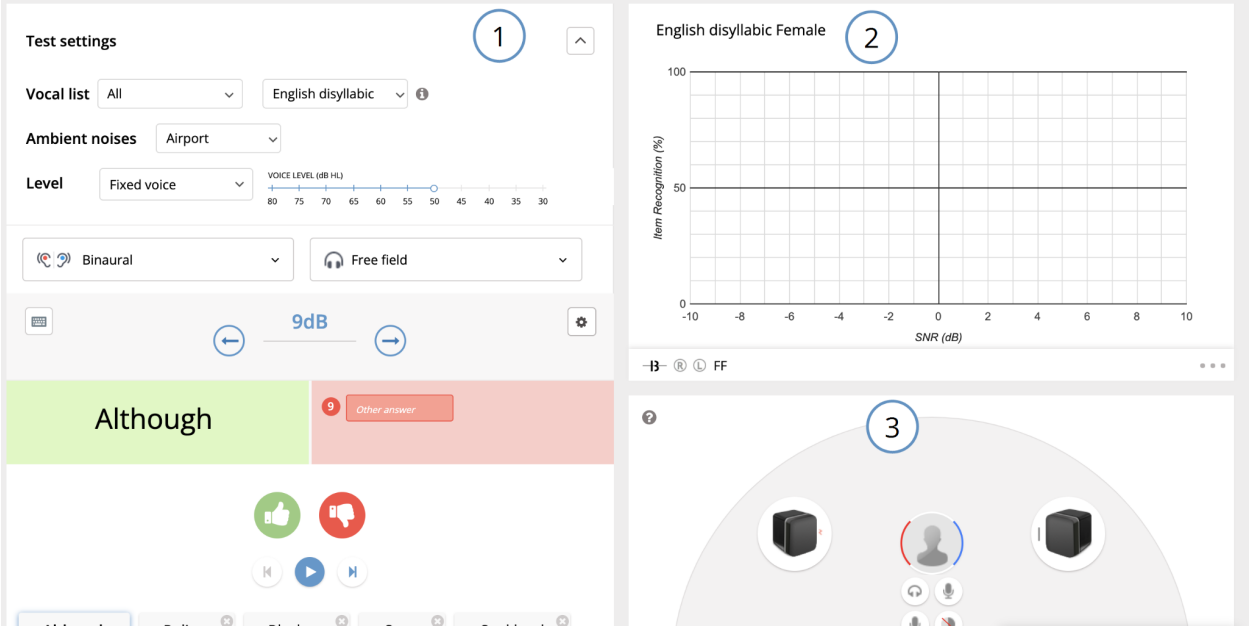
## Accessing the Speech Test (In noise)

1. Navigate to the Speech Testing page by clicking on the **Test Menu**
2. Click on the **Speech In Noise** icon

## Navigating the Speech Test (In Noise) Page

Similar to the regular speech testing page, the page is divided into **three** sections:

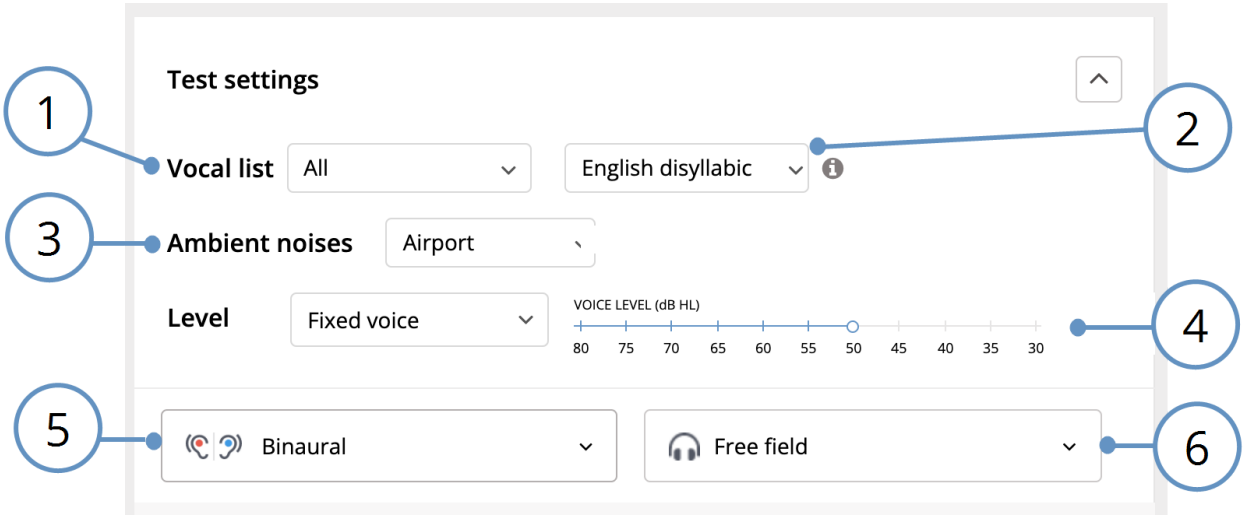
1. **Control Panel:** Used to configure test settings and transducer type, and contains the speech test controls
2. **Results Panel:** Displays the results of each test. Can only be displayed in graphical view
3. **Test Control Panel:** Used to control the function of the patient's transducers during the test, I.E. switching ears, applying masking, activating talk forward etc.



# Completing a Speech Test (In Noise)

Under the **Levels** tab, configure the speech test's settings before conducting the test.

1. Select the language from the drop down menu
2. Select a list type from the drop down menu (i.e. English Spondees)
3. Select an ambient noise from the drop down menu to be used during the test
4. Select either fixed voice and fixed noise, and set the voice level in db HL using the slider
5. Select which ear is being tested: right, left, or binaural
6. Select a transducer from the drop down menu




## Starting the Speech Test

Clicking on the blue "Play" button  in the middle of the screen will start the test.

Click on the  icon for a list of helpful keyboard shortcuts. (See page 79 for an overview of keyboard shortcuts)

Presentation levels can be changed by clicking on the right/left blue arrows 


An upcoming word can be skipped by clicking on the small "x" next to it.

Click on the Play button to present the word along with the ambient noise.

If the patient responded with the correct word, click on the green box containing the word, or click on the green "thumbs up" button.

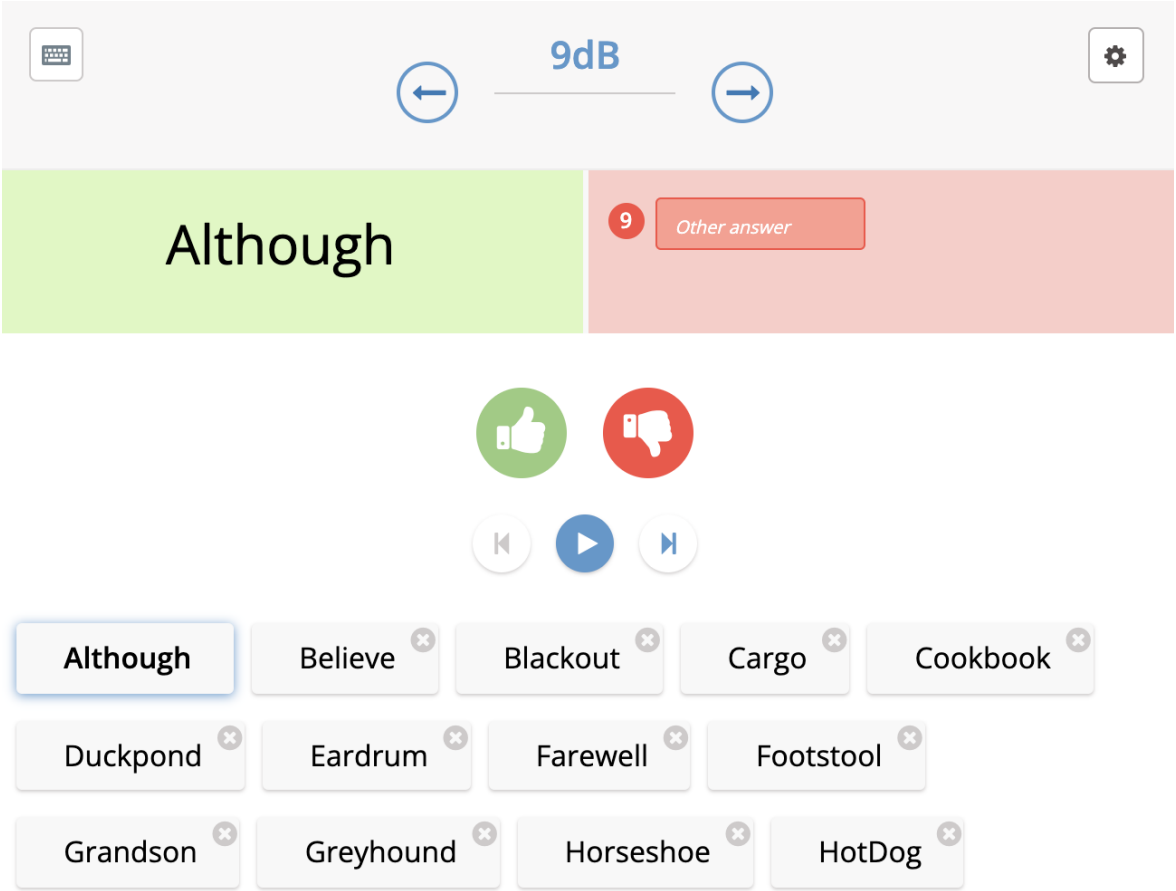
If the patient responded incorrectly, type in what you heard the patient say in the "Other Answer" field then click the red box or the red "thumbs down" button.

Move on to the next word by clicking on the "Next" button

Return to the previous word by clicking on the "Previous" button

Use the red "other answer" box to type in incorrect responses to track common word mistakes and review them to help with counseling.

Repeat for the other ear.



# ANL Test

The ANL test (Acceptable Noise Level) measures the minimal emergence of speech in noise, providing a comfortable listening sensation. It is used as a predictor of how well a patient will do with a hearing aid.

## Accessing the ANL Test

1. Click on **Test Menu** 

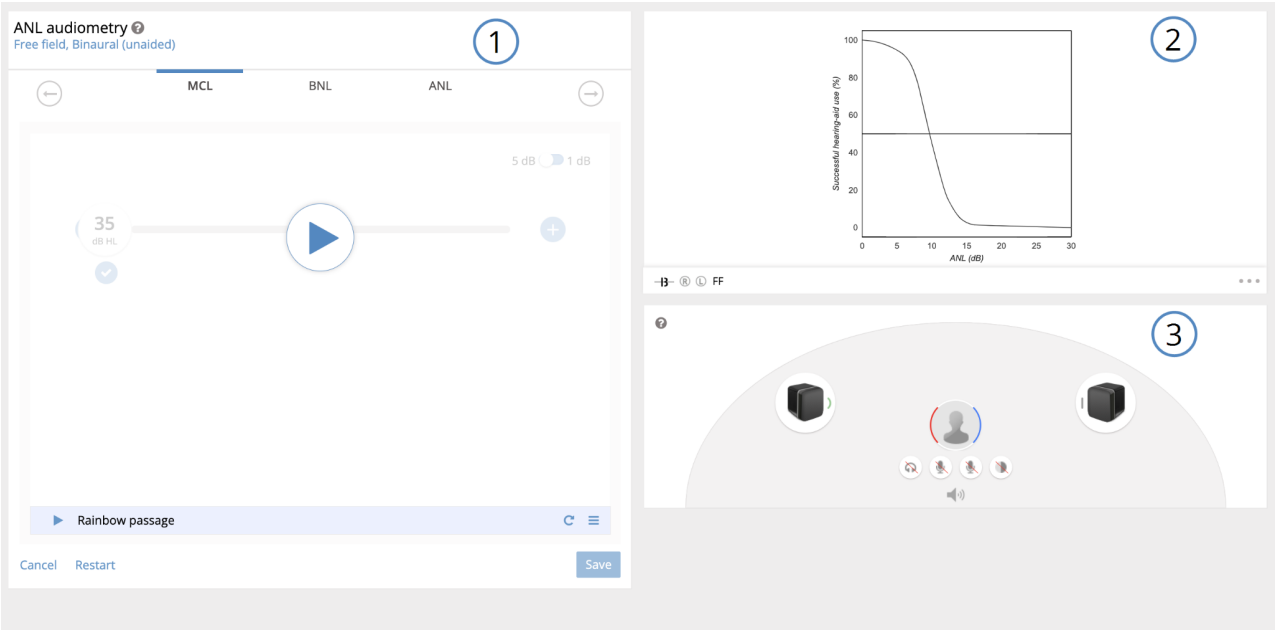
to select a test type

2. Select the test by clicking on the **ANL** icon 

***Note:*** If your audio setup is not completed, you will be taken to the audio setup page to complete the setup instead of being taken to the test page.

## Navigating the ANL Test Page

1. **Control Panel:** Contains all controls used to execute the test
2. **Results Panel:** Displays the results of each test. Can only be displayed in graphical view
3. **Test Control Panel:** Used to control the function of the patient's transducers during the test, I.E. switching ears, applying masking, activating talk forward etc.



# Completing an ANL Test

There are two main steps in completing an ANL test:

1. Finding the MCL (Most Comfortable Level) while listening to a speech passage

2. Adjusting the level of the noise in order to measure the minimum Signal-to-Noise Ratio (SNR) required to still listen in comfort to the story transmitted at the previously-defined speech intensity

### Stage 1: Measuring the MCL (Most Comfortable Level)

Instruction:
"You are going to hear a story coming out of this loudspeaker. First we will increase the volume until you think the words are too loud. Then we will decrease the volume until you think the words are too quiet. Finally, we will adjust this volume to find the level most comfortable for you."

### Stage 2: Measuring the BNL (Background Noise Level)

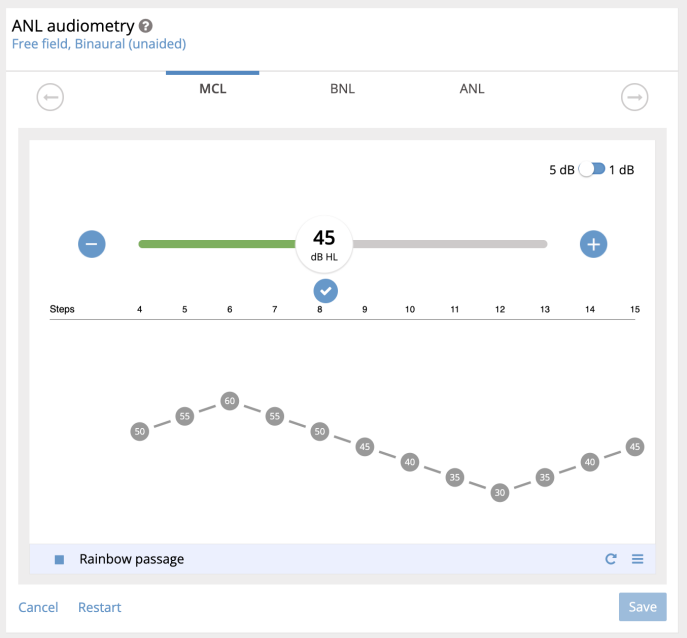
Instruction:
"You are going to hear the same story with background noise. First we will increase the volume of the noise until you indicate that it is too loud to allow you to understand the words. Then we will reduce the volume of this noise until you indicate that you understand the story very clearly. Finally we will adjust the volume of this noise to the MAXIMUM tolerable level at which you can listen to this story for a long time. "

### ANL Test Controls

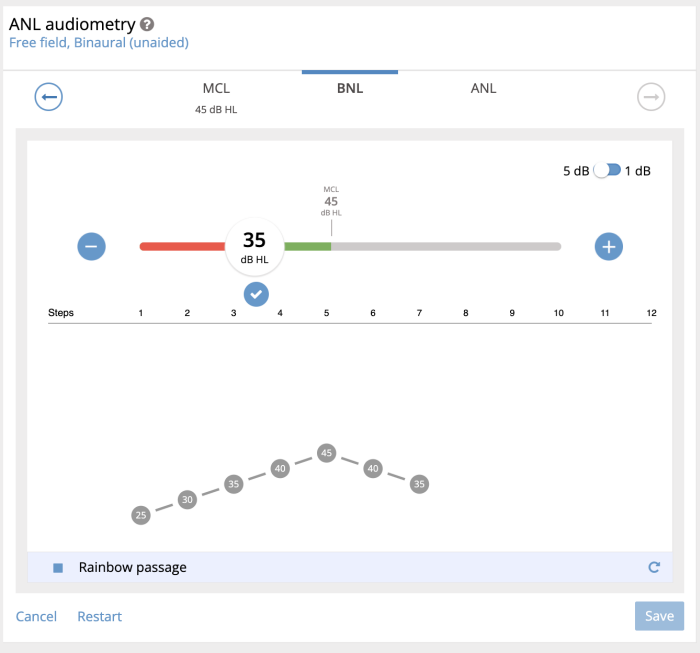
- Clicking on the blue "Play" button  in the middle of the screen will start the test
- Use the toggle in the top right corner of the control panel to adjust if the volume will be raised in increments of 1dB or 5 dB 

- Select the speaker's voice and the passage to be read by clicking the "ladder" icon  and selecting from the list provided
- Adjust the dB level using the plus and minus keys on your keyboard or the plus/minus buttons on your screen 

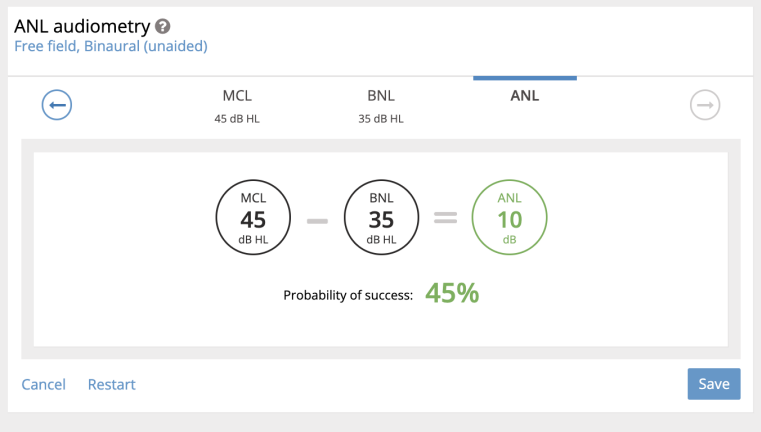
- Once the MCL level has been determined, click the **checkmark** on your screen or the "**V**" key on your keyboard to confirm your MCL




- Confirming the MCL automatically moves into measuring the BNL. Repeat the above process to determine the BNL



- After confirming the BNL, the test will calculate the ANL and display the results




- If you need to move back a step, you can use the **right and left arrow** icons on your screen or the right and left arrow keys on your keyboard to move between stages of the test

- If you need to reset either the MCL or BNL, you can reset the measurement by clicking the "**repeat**" icon. Alternatively, you can click on **Restart** to start the entire test over from the beginning or **Cancel** to quit out from the test and return to the patient's folder

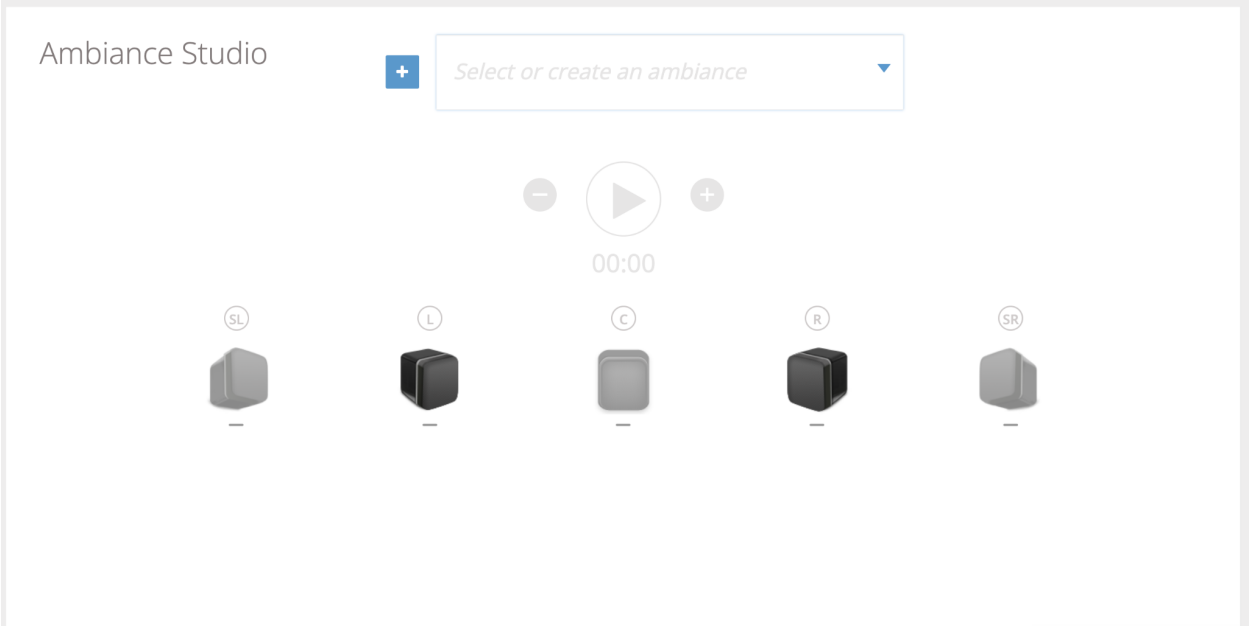
- If you are satisfied with the result, click **Save** to save your changes and end the test
- Using the 'SHOEBOX assistant' smartphone application, available for iOS and Android, allows you to conduct an ANL test in guided mode without needing to be close to your computer.

# Ambiance Studio

The Ambiance Studio tool is specific to the SHOEBOX Platform. It allows you to recreate a realistic sound environment, like a restaurant or airport terminal, to use during testing or counseling.

## Accessing the Ambiance Studio

Ambiance Studio is accessed from the main drop-down menu. 

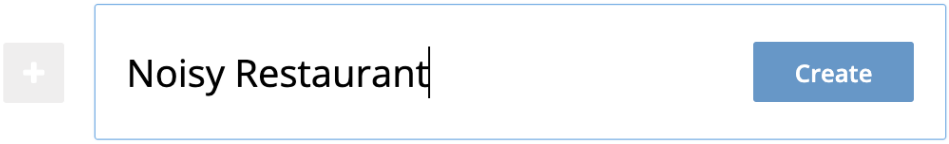

***Important:*** With the aim of being as close as possible to real listening conditions, use of sound ambiance is limited to free-field only.

## Creating your Ambiance

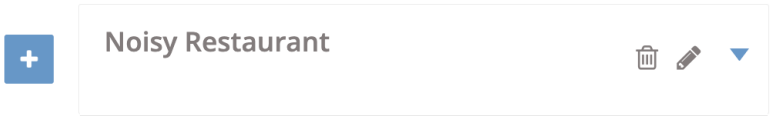
1. Click the plus icon  at the top of the page to create a new sound ambiance.

2. Type in a name for your ambiance. We recommend assigning it a name that's both descriptive and easy to remember, to make it easy to search for

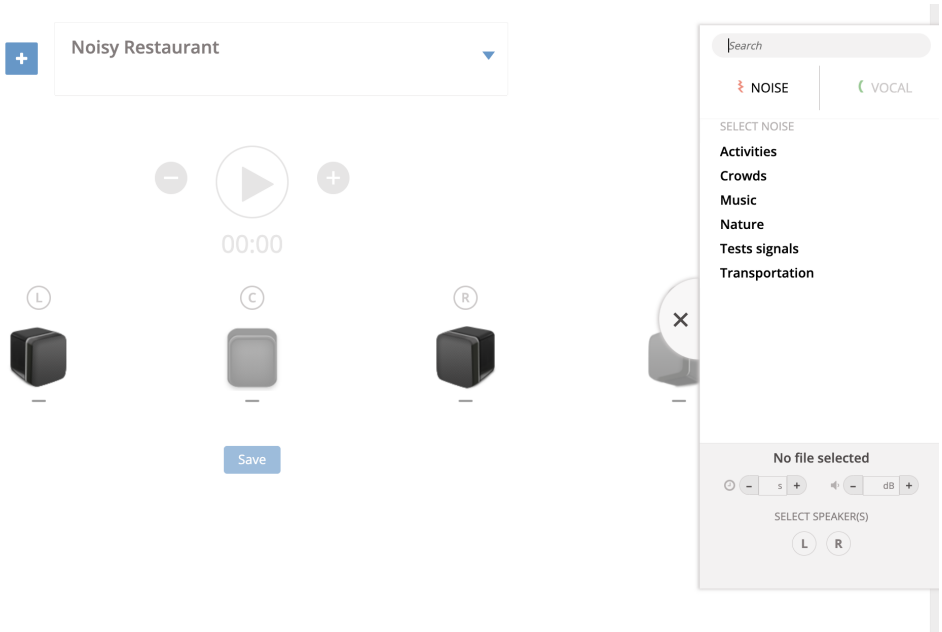
3. Click on **Create**




***Tip:*** you can change the name of your ambiance or delete your ambiance at any time by hovering over the name of your ambiance with your cursor, and selecting the pencil icon to edit or the trash can icon to delete.

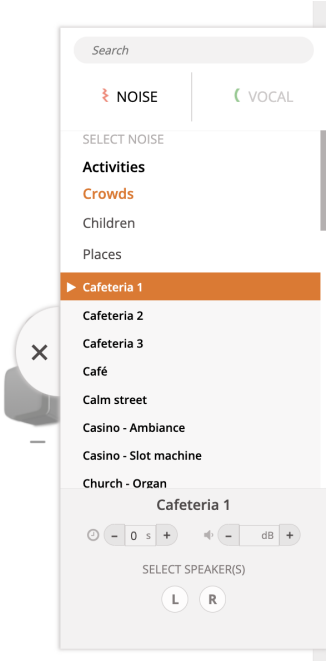



4. Click the **blue semi-circle plus button** on the right side of your screen to open the soundtrack menu, where you can find a list of tracks to add to your ambiance



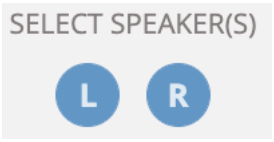
5. The tracks are split between two menus: **Noise** NOISE which contains samples of background noises such as vehicles, crowds, and machinery, and **Vocal** VOCAL which contains vocal samples used for audiometric hearing testing (syllables, words, passages etc.).

   Browse through the menus or use the search bar to find tracks to add to your ambiance. You can test play each track by clicking on them in the menu, then clicking on the **play** button ▶ to play it, and the **stop** button ☐ to stop it




6. Once you have found a track that you would like to add to your ambiance, use the controls at the bottom of the soundtrack menu to add them to your ambiance

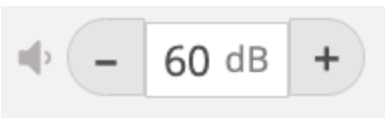
   a. First, use the buttons under the "Select Speakers" heading to select which of the free-field speakers will play the track. You can select left, right, or both speakers in a two-speaker configuration, or 1-5 speakers in a 5-speaker configuration



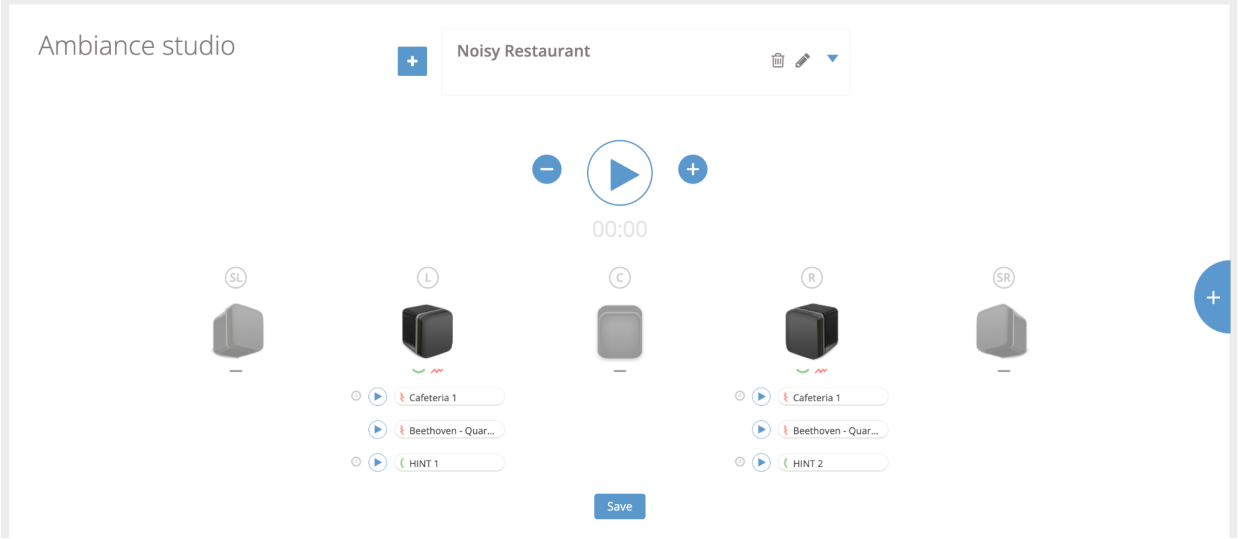

   b. Next, use the latency gauge to determine when the track will start playing in your ambiance by adding or removing seconds of delay using the + and - buttons




   c. Finally, select the dB level of the track using the volume gauge on the right



7. Continue to add and adjust tracks to your ambiance until your ambiance is complete. At any time, you can click on a track added to your ambiance to edit that track directly




8. Finally, be sure to click on the blue **Save** button to save your changes

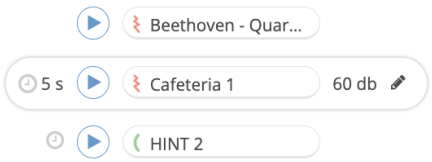
# Listening to your ambiance

You can listen to your ambiance at any time by pressing the central **Play** button and stop listening by pressing the **Stop** button. If you want to play or stop tracks individually, use the Play and Stop buttons located next to each track.

Use the Plus and Minus buttons to adjust the master volume of your ambiance.
***Note***: this will adjust the dB levels of ALL tracks in your ambiance at once, so you may need to adjust the dB levels of individual tracks accordingly.

The tracks assigned to each speaker can be found below the image of the speaker they are assigned to.

Hover over a track to display its current settings. Tracks with a clock icon are tracks that have had latency added to them. Click on the track to edit it in the soundtrack menu.



# Accessing your Saved Ambiance

Once created and saved, your ambiance is added to the list of ambiances associated with the active booth.

This list, located at the top of the screen, lists all the ambiances previously set up with their name and respective creation date.

You can find your ambiance by either scrolling through the drop-down list, or by using the search bar.

# Sonogram

The SHOEBOX Platform sonogram enables you to view the sound signals picked up by the microphone located in your booth. This allows you to analyze any type of audio signal, to better comprehend the cause of your patient's phonetic confusion, and to explain it to them in simple terms.

## Accessing the Sonogram

The Sonogram requires your microphone to be connected and is only accessible once your booth has been calibrated with free-field. The sonogram is accessed from the main menu by clicking on the Sonogram icon, or by clicking on the SLM (Sound Level Meter) located in the top right corner of your screen.






## Reading the Sonogram

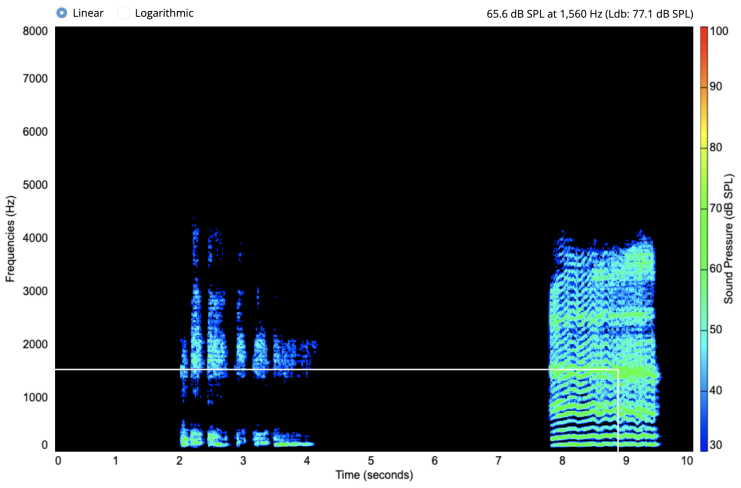
The Sonogram represents a three-dimensional graphic chart traced in real time.

- The X-axis indicates the time (in seconds).
- The Y-axis relates to the frequencies (Hz).
- The intensity is measured in dB SPL and is displayed by means of a color code scale, displayed on the right, which ensures optimum readability.

To improve your analysis, two frequency display modes, linear or logarithmic, are available.

You can freeze the Sonogram at any time by clicking directly onto the sonogram graph. You can then drag your cursor on the graph to display the dB SPL and frequency in Hz of any highlighted point on the graph.

To resume measurement, click on the sonogram graph once again.



# Starting a Remote Session

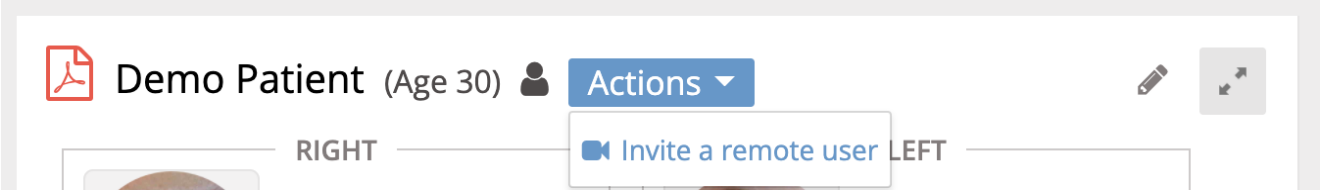
The SHOEBOX Platform offers a remote in-office solution for all functions on the SHOEBOX platform.

## Getting Started

1. Access the **Patient Folder** by clicking on the Patient Folder 

icon in the main menu or by clicking on the Patient Panel on top of the page
2. On the information panel, click on the **Actions** button 

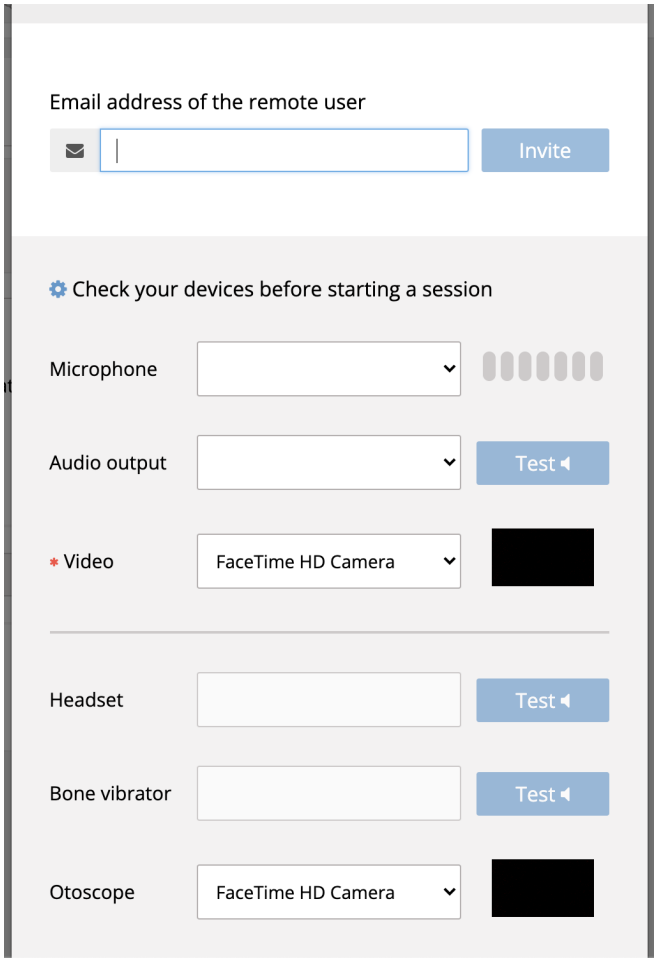
3. Click on **Invite a Remote User**




## Invite a Remote User

This is typically used to support a clinical assistant working with a patient at a remote location. The assistant will use this feature to send an invitation to a hearing care professional to join the session remotely.

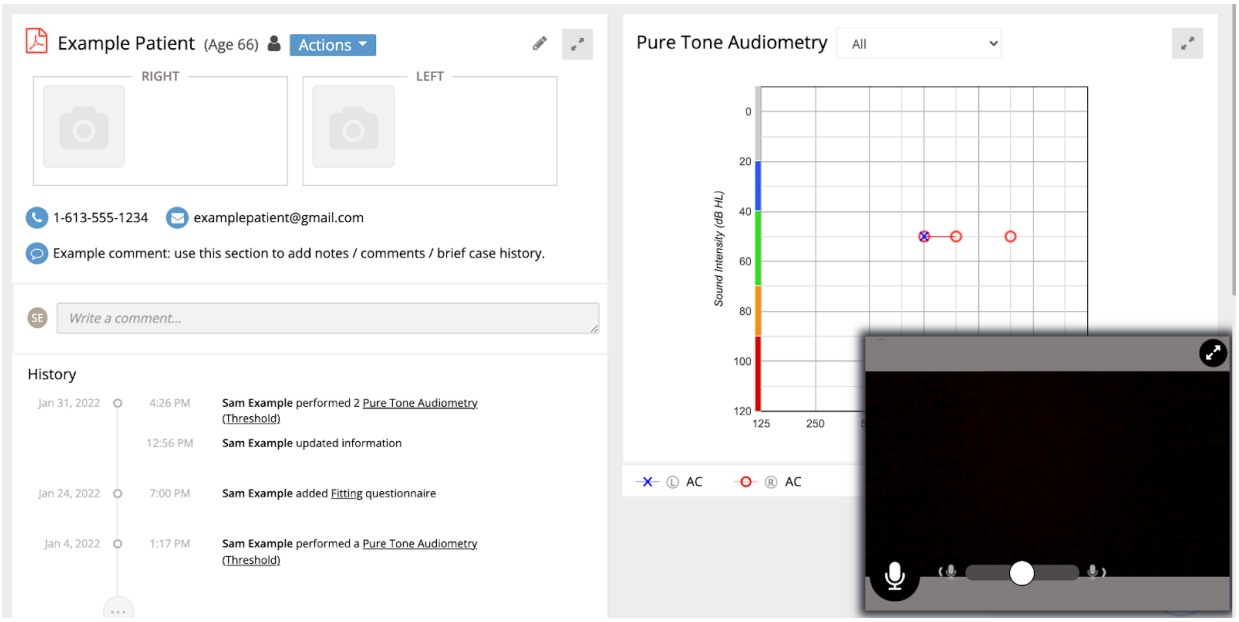
Clicking on **Invite a Remote User** from the patient's side will open a window that will allow you to select and test all of your hardware before sending an invite to the email address of the hearing care professional to initiate the remote session.




***Note:*** the headset and bone vibrator devices are automatically selected once they are plugged in.

# Video Conferencing

Once the session has begun, a window will appear in the bottom right corner of the page, connecting you with the patient. The window can be moved around the screen if necessary by clicking the window and dragging it to your preferred position.




Clicking on the microphone icon will mute/unmute your microphone.

The volume slider can be used to raise or lower the volume of your microphone.

Clicking the expand icon will enable full-screen mode for the video conference. This view will also add a picture-in-picture view of your video.

Once you have connected to your patient via video conferencing, you can begin any test with the patient.

Both the hearing care professional and the patient have the ability to end a video conferencing session by clicking on the **Finish Session** button in the remote control on the bottom-middle of the screen.



# Remote Otoscopy

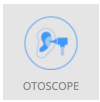
This feature is functionally identical to the regular otoscopy feature, with the added benefit of allowing the remote hearing care professional to capture otoscopy images over video conferencing while the otoscopy is performed in-clinic, either by an in-clinic assistant or by the patient.

***Important:***

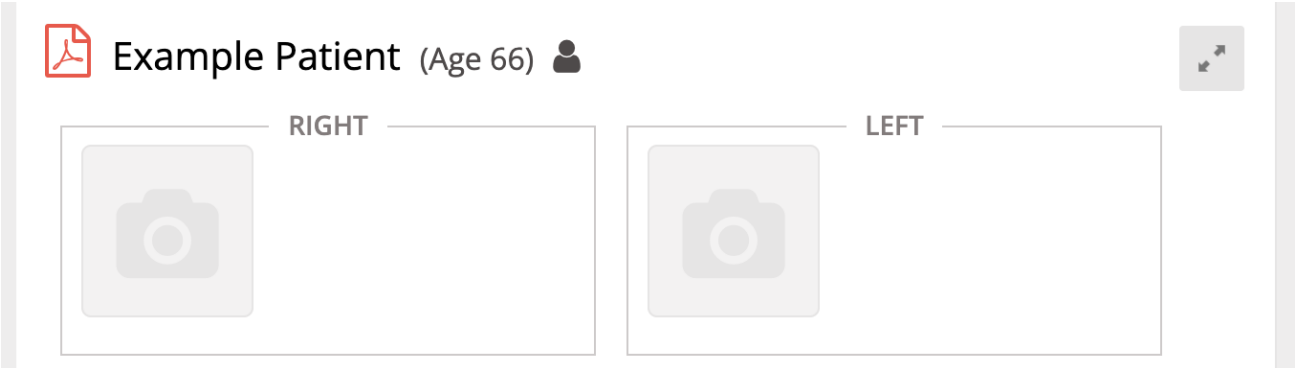
1. Ensure that the speculum is inserted properly and securely, and that the light is on at the end of the otoscope.

2. Note that once you navigate to the otoscopy tool, the patient's view will switch to their otoscope camera and they will no longer see the remote clinician.

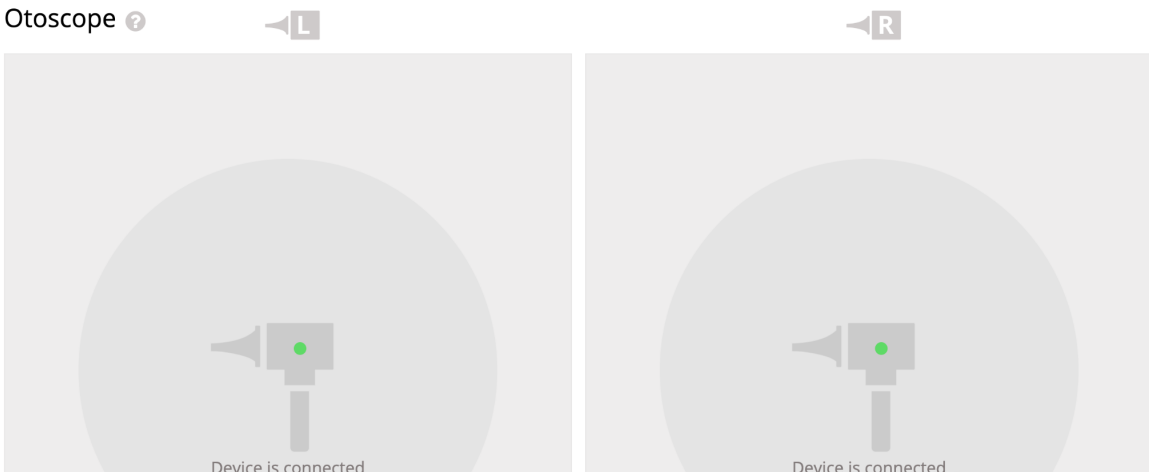
3. It is recommended to show otoscopy best practices to patients/assistants prior to clicking on these icons to ensure safe insertion.

From the main menu, click on the **Otoscope** icon 


***Note:*** You can also access the otoscope page from the patient folder by clicking on the camera icons for the right or left ear. (See image below)



1. Click on the right (R) /left (L) otoscope icons to open the camera

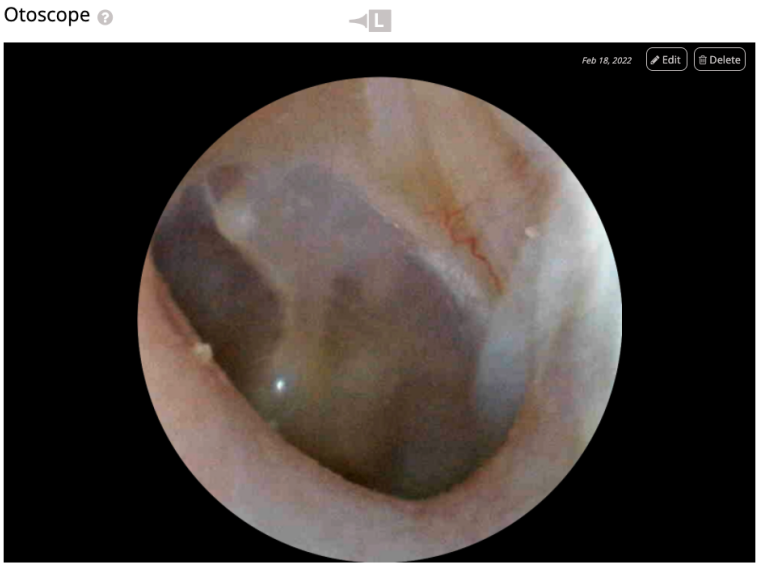



2. Instruct the patient/assistant to carefully insert the speculum into their ear
3. Once the patient's eardrum is in view, click on **Capture** to capture the image

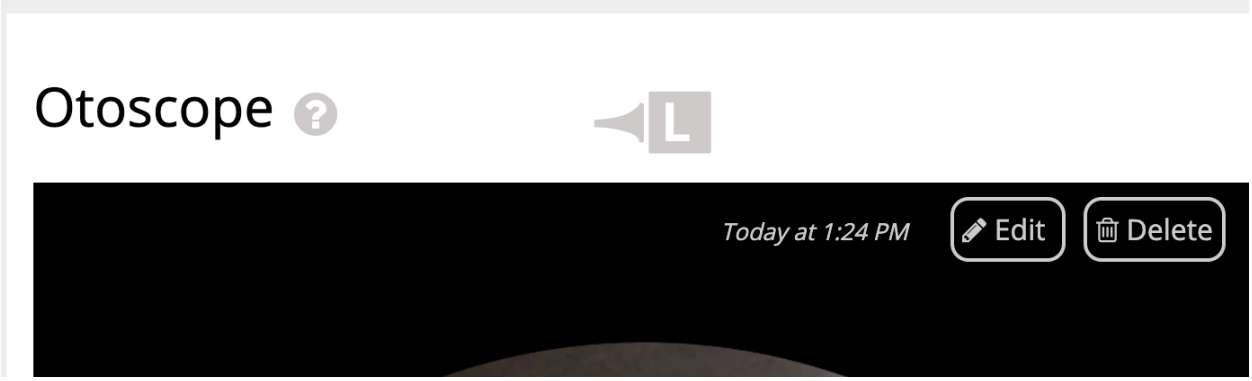




4. Click on **Save** to save the image to the patient file
   ***Note:*** You can also crop the image and save the edited version.




To delete or edit the image after you saved it, click on the **Delete** button or **Edit** button respectively.




***Note:*** click on the question mark to view the keyboard shortcuts for the otoscope page. (See page 79 for an overview of keyboard shortcuts)

5. After capturing the images, instruct the patient to turn off the otoscope's light to avoid overheating

# Remote Pure Tone Test

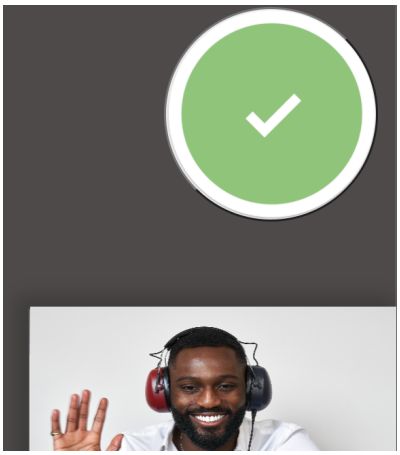
The remote pure tone test functions identically to the in-clinic pure tone test, but allows the test to be performed by a remote clinician without the need of an in-clinic assistant to guide the patient.

***Important:*** the remote clinician should click on the microphone icon to mute their microphone before beginning the test. Make sure the microphone is muted before testing.

1. Click the **Pure Tone Test** icon in the top right corner of your screen
   ***Note:*** by default, you will be testing the right ear first, indicated in red on the audiogram

2. Press **Space** on your keyboard, or use the play icon on the manual testing panel, to present a tone at the desired frequency (Hz) and intensity

3. The patient will have a **green checkmark** button appear on their screen during the test. Instruct the patient to click this button when they hear a sound. Alternatively, they can raise their hand or provide verbal confirmation that they heard the tone



4. To change the sound intensity (dB HL), click the **up/down arrows** on your keyboard or click on the up/down arrow icons

5. To change the frequency (Hz), press on the **left/right arrows** on your keyboard or click on the right/left arrow icons

6. To save a threshold, click on  or press **Enter** on your keyboard

7. To delete a threshold, click on  or press **Delete** on your keyboard

8. Once you have finished testing the patient's right ear, press the **L** key on your keyboard to switch to the patient's left ear

9. Repeat steps 2 to 7 then click on **Save** when finished.

## Switching to Bone Conduction

To perform remote bone conduction testing with the forehead bone transducer, there are a few extra steps to cover before you can continue.

### Prepping the Patient: Placement

1. To start, place the black elastic headband around their head, across the forehead, and connect the velcro squares
   ***Note:*** the loosest square will fit most heads, and it should be purposefully tight

2. Place the bone transducer under the band with the round flat faceplate on the patient's forehead, and the velcro dot facing the band

3. Place the headphones on the patient's ears
   ***Note:*** when testing in unmasked conditions, the best ear will be responding

***Important:*** The bone transducer has been calibrated for forehead placement and to account for both ears being occluded during all bone testing. With the occlusion effect already being accounted for in the calibration, it should not be added to any masking calculations.

# Remote Speech Test

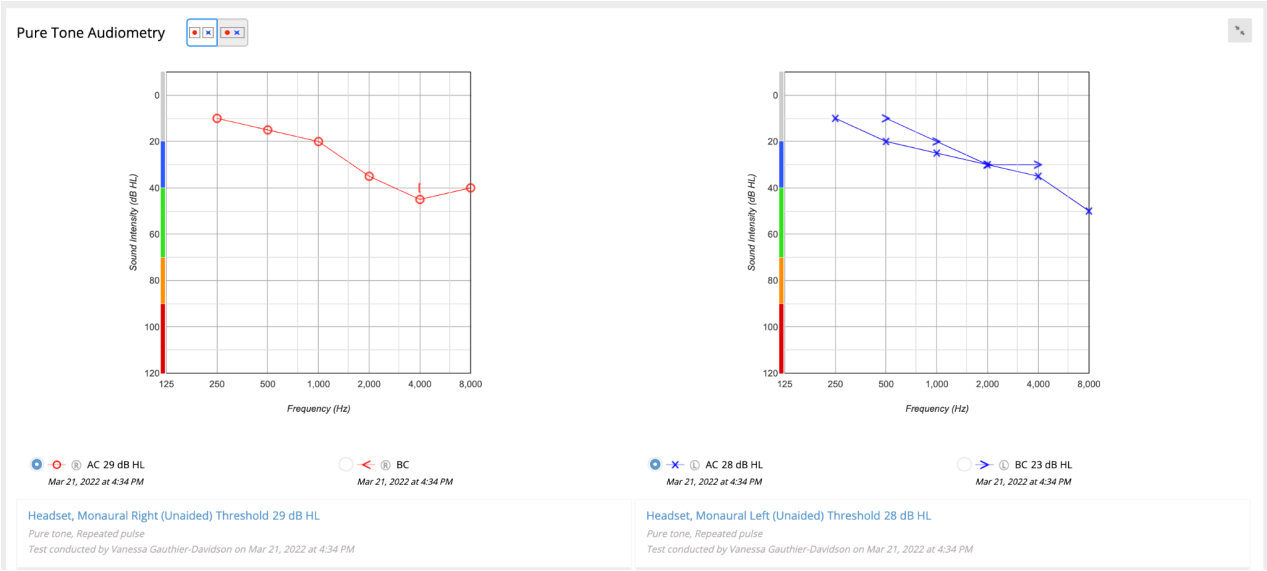
Much like the other diagnostic tests, performing a speech test remotely on the SHOEBOX platform is functionally identical to performing it in-clinic. In this case, however, there are no additional steps or requirements to perform a speech test remotely. The test will be administered by a remote clinician, and the patient will respond via the video conference call. For a detailed guide on how to perform speech testing using the SHOEBOX platform, refer to the Speech Testing section of this guide.

# Reviewing Results

After completing a test, the results will be displayed on the Patient Folder page.

Audiograms are displayed for both the right and left ear, with additional test data and test history listed below.

These results will be stored in the Patient Folder and can be viewed at any time.



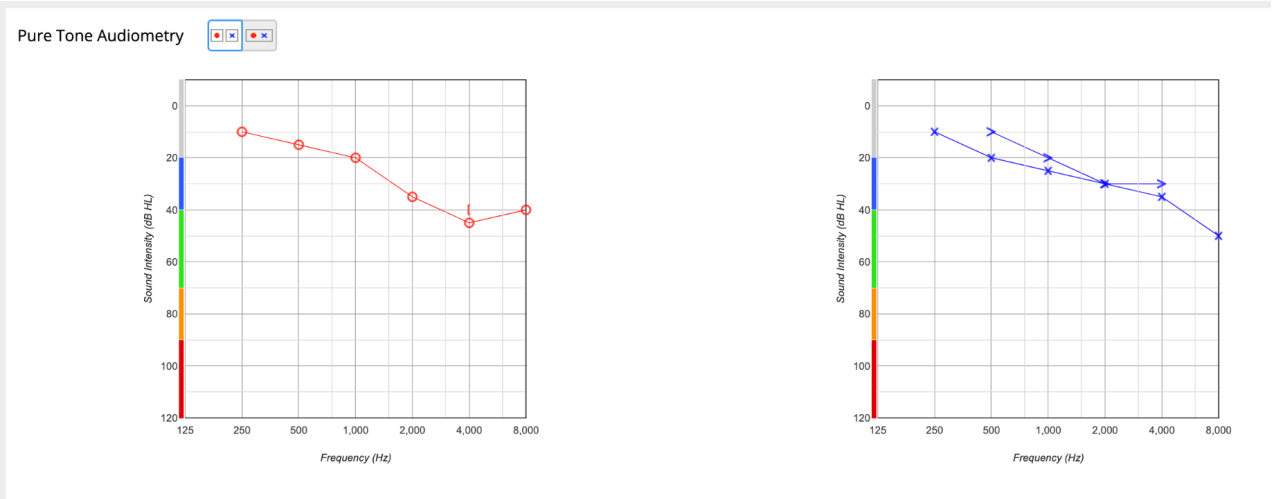

Each individual test results for a patient can be easily accessed using the Patient Folder menu located in the bottom right of the page.



# Changing Views

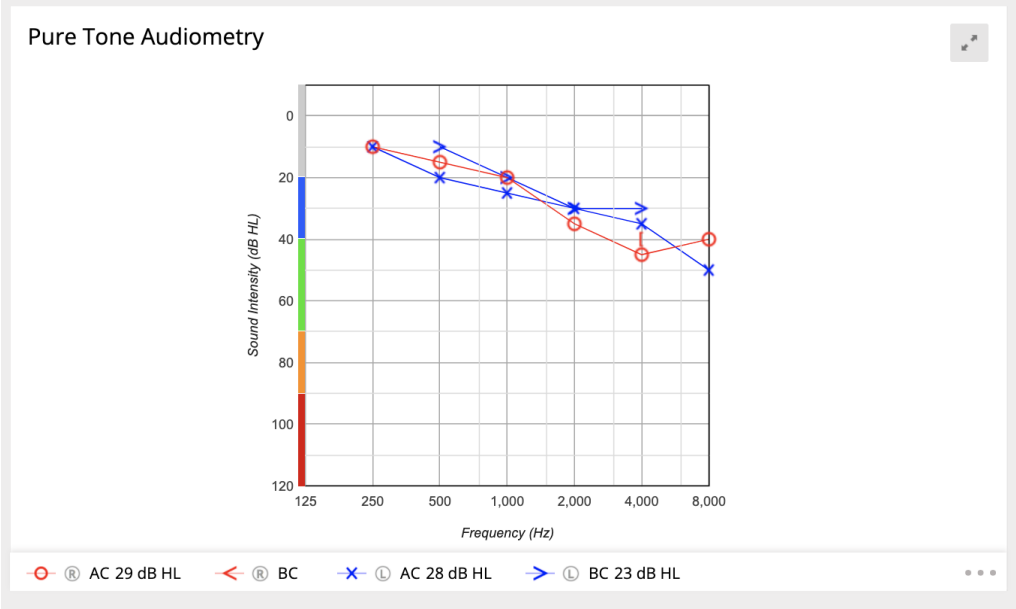
You can expand or condense the view of the patient folder by clicking on and .

## Expanded View



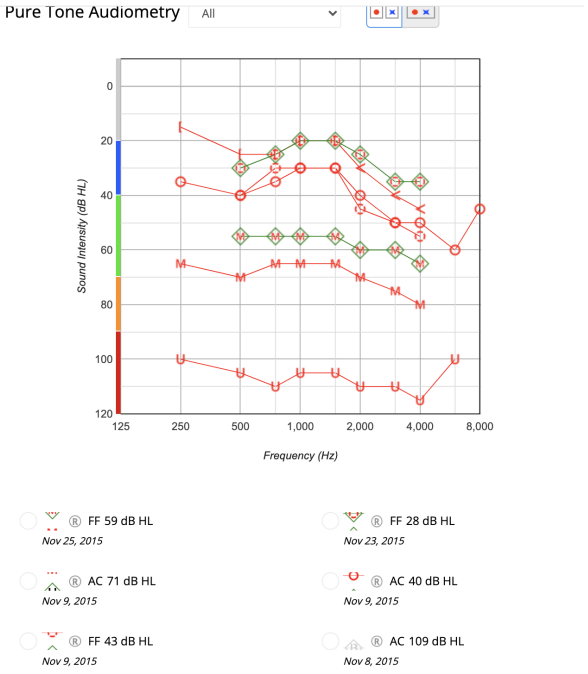

## Condensed View

In either view, clicking on a test result will remove it from the audiogram graph.

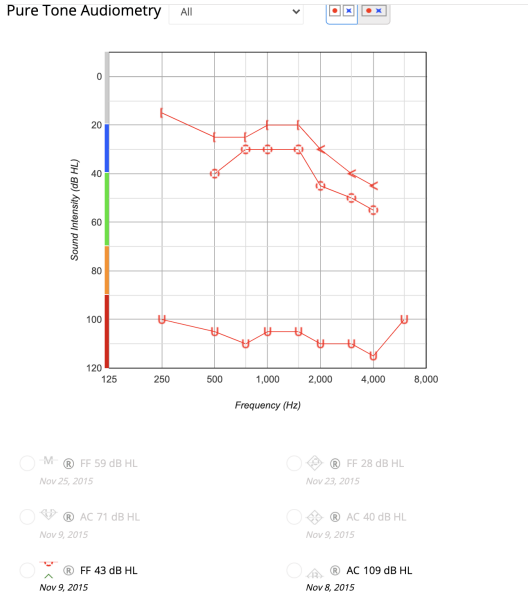



Results removed from the graph will be grayed out. Click on the grayed out results again to add them back to the graph.

## All results enabled




## Some results disabled

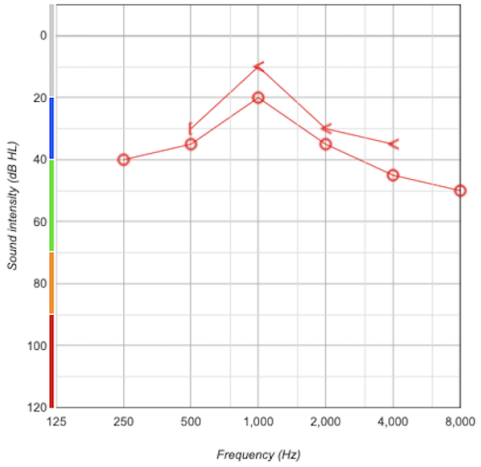


## Graph Comparisons

Graph comparisons are used to evaluate change in hearing over time and counsel patients on their changes in hearing.

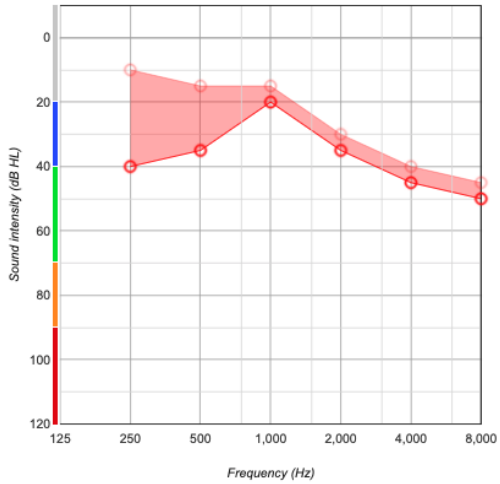
To compare two test results on a graph:

1. Click on the bubble next to a test result to select it
2. Hover over the test result you want to compare it to, then click on the **graph comparison** button 









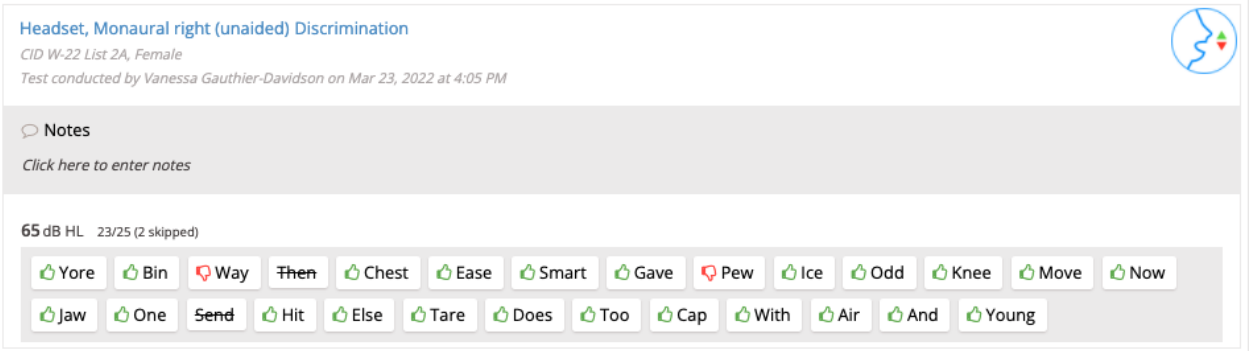
# Detailed Results

Clicking on the bubble next to a test result will display detailed information for that test. This information will appear below the audiogram panel. These detailed results are used for traceability; they show you the type of signal used, number of presentations, and the dB HL of every tone that was presented.




## Detailed Speech Results

Detailed results can also be viewed for speech tests. These will let you know which list was used, which words were correct/incorrect/skipped. It is a good practice to examine the detailed results if you will be looking to make comparisons over time or comparisons between aided and unaided tests.

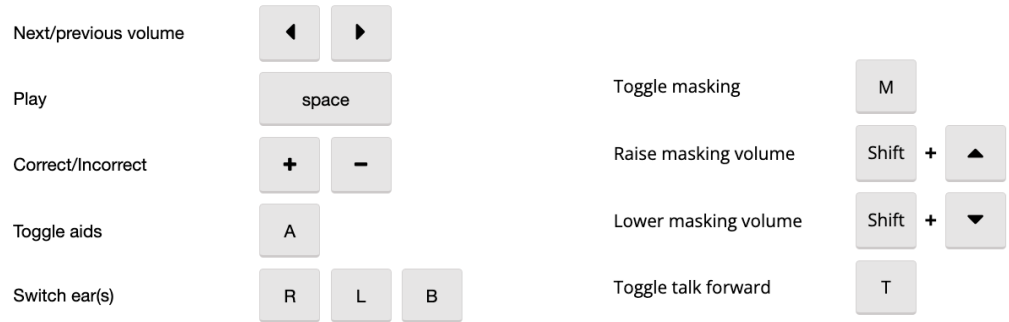


# Keyboard Shortcut Overview

## Pure Tone



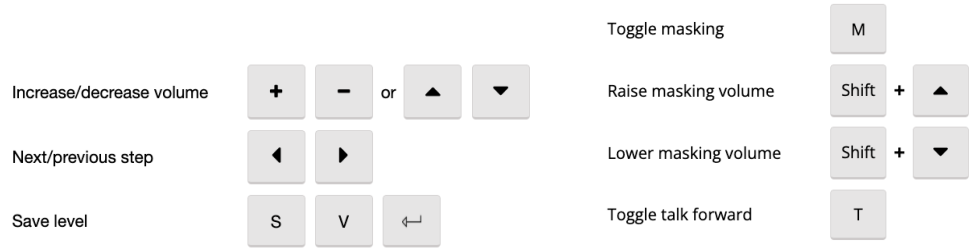

## Speech



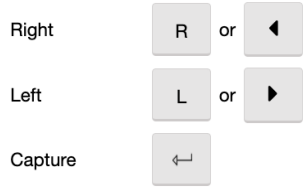
# Speech Discrimination + Speech in Noise




# ANL




# Otoscopy



# SHOEBOX Platform Specifications

| | |
|---|---|
| Audiometer Type | ANSI S3.6 2018: Type 2 |
| Permissible environmental conditions | SHOEBOX Platform is standalone software which is not impacted by the specified environmental conditions |
| Permissible power supply variations | SHOEBOX Platform is standalone software which does not incorporate internal power supply |
| The ballistic characteristics for the monitoring meter | All speech materials used within the product are prepared and pre-calibrated to be aligned on the standard reference level of the presentation's transducer. They consist of digital lossless files that suffer no alteration when used on a standard computer environment, according to the product's requirements. |
| Identification of the transducers and their reference equivalent threshold levels | See transducer calibration certificate for information on transducer calibration |
| Range of frequencies and hearing levels for each transducer provided | • Air Conduction: 125 - 16000Hz<br>-10dB HL to 110 dB HL (Type 2 Level Compliant)<br>• Bone Conduction: 250 - 4000 Hz<br>-10 to 70dB HL (Type 3 Level Compliant)<br>• Sound Field: 250 - 8000 Hz<br>-10 to 120dB HL (with external amplifier) |
| Ear simulator used for calibration | As per ANSI/ASA S3.6-2018 |
| Static force provided | As per ANSI/ASA S3.6-2018 |
| Warm up time | No warm up time required |
| The bone vibrator output, the frequency response and tolerances in the range from 250 to 4000 Hz | The available freq for bone vibrator are defined within product configuration -- The bone vibrator is enabled for all half-octaves frequencies between 250 and 4Khz within the product's configuration |
| The specification of how conformity with this standard is to be achieved using loudspeakers not provided by the manufacturer of the speech audiometer | n/a, software |
| The sensitivities and nominal impedances of all input facilities; the available voltages and nominal impedances of all output facilities; and the pin assignment of all external plug connectors | n/a, software |
| The test frequencies at which bone-conduction thresholds obtained in an unoccluded ear may be invalidated by radiated air conduction sound pressure levels attributable to nonlinearity of the bone vibrator | n/a, software (see transducer documentation ) |
| Resolution and rate of change of sound pressure level for automatic-recording audiometers | n/a |

| | |
|---|---|
| Resolution and rate of change of frequency | n/a, not a Bekesy algorithm |
| The duration of the time interval during which the patient may respond and the algorithm governing the test procedure | n/a, the presentation is manually controlled by the operator |
| Frequency of modulating signal | Warble tone frequency = 5Hz |
| Modulation waveform | Sine |
| Modulation range | 6% |
| Sound attenuation characteristics of the earphones as measured in accordance with ISO 4869-1 | For transducer sound attenuation characteristics, refer to transducer manufacturer documentation |
| Information about the time window for subject's response for automated test procedures | Pure tone forced choice modality does not involve subject response timing |
| Type of battery, means of checking the battery and method of replacement, expected battery life time | N/A, not a battery operated audiometer |
| The limits of battery voltages within which a battery operated audiometer meets its specifications | N/A, not a battery operated audiometer |
| Maintenance and calibration procedures and schedules | Headphones must be calibrated annually per ANSI/ASA S3.6-2018<br>Calibration procedure verifies correct operation and identifies required maintenance |
| Hazards arising from functional failure, maintenance, and aging | Functional software failures are not anticipated to cause hazardous situations to the patient and/or user. Hardware maintenance and aging hazards are not applicable. |
| Type of auditory signal | Pure tones, warble tones, pulsed tones, masking tones, speech recordings |
| Type of transducers and their headband force | Various ANSI/ASA S3.6-2018 compliant transducers are available, refer to transducer manufacturer's documentation |
| Type of ear simulator or mechanical coupler used for calibration and the method of coupling the transducer | See calibration certificate for each transducer |
| Type of calibration | Calibrated in dBHL for known RETSPLs for each transducer according to ANSI/ASA S3.6-2018 |
| Acoustic or Vibratory Signal Level for a given setting of the output-level control | Control interface displays dBHL based on RETSPL of the currently selected transducer. This is mapped to output voltage level appropriately |
| Polarity of resulting acoustic or vibratory signal | Left and right channel outputs produce in-phase sounds and their polarity is set during calibration |
| Duration of the initial sound pressure or vibratory force wave of a click and/or duration and rise/fall times of acoustic or vibratory tone-bursts | As specified in ANSI/ASA S3.6-2018 |
| Subjective relationship between test signals and reference signals | RETSPLs from the manufacturers are used to enable normalized hearing level outputs |

| | |
|---|---|
| RETSPL for Speech | Per ANSI definition, the RETSPL value of the transducer at 1KHz + 12.5 dB (see applicable transducer documentation) |
| Environmental conditions at time of calibration | As specified in ANSI/ASA S3.6-2018 and as recorded in annual calibration equipment certification |