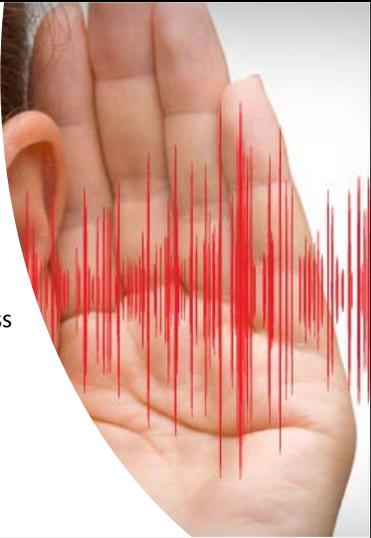


- Hyperacusis Activities Treatment is counseling program that includes education about hyperacusis, counseling on reactions to hyperacusis, and treatments to relieve symptoms such as sound therapy, medications, and relaxation exercises. The activities treatment is modified from Tinnitus Activities Treatment.

Hyperacusis Activities Treatment uses picture-based counseling and has several advantages for hyperacusis management, including:

- The clinician does not overlook important concepts
  - It is easier for the patient to understand concepts
  - Treatment can be easily used by other clinicians
  - Therapy can be adapted to the needs and interests of the patient
- 
- These slides can be presented in one-1 hour session, or presented over several sessions. We typically begin therapy for a new patient with hyperacusis in one session and review as needed.



Overview

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- Introductions
- Discuss experiences with hyperacusis
- Explain hearing, hearing loss and hyperacusis
- Review treatments for hyperacusis

- The best place to start is with introductions either with the therapy group or if it is a one-on-one session, with the patient.
- Get to know them better by discussing their experience with hyperacusis, what brought them to the clinic, and what they are expecting out of treatment. A general explanation of how hearing works, as well as hearing loss and hyperacusis will also benefit the patient(s).
- Discussing treatments such as sound therapy, counseling, relaxation, and medication that could be used to decrease hyperacusis symptoms is also important, giving the patient(s) a sense of hope that their symptoms can be improved.

Education

- Knowledge is the first step to successful management of your hyperacusis
  - How does hyperacusis affect you and in what environments it is most problematic?
  - What strategies are effective for managing your hyperacusis?
- Be confident in communicating your needs to others



KNOWLEDGE IS POWER

- The famous Francis Bacon quote "knowledge is power" holds true with hyperacusis. Educating patients on the condition is the first step for them in understanding and managing their hyperacusis. Addressing questions such as:
  - how does hyp. affect you and in what environments?
  - What strategies are effective?
- Will build confidence in your patient that they will be able to communicate their needs and manage their hyperacusis and start to regain control again.

## What is hyperacusis?



- Reactions to moderately-loud sounds are too loud, annoying, fearful, and/or painful
  - Four types
- Affects 6-17% of general population
- Other terms that are used:
  - Misophonia
  - Select Sound Sensitivity

- Hyperacusis emphasizes reactions to moderately-loud sounds as very loud, annoying, fearful, and/or painful.
- Hyperacusis affects approximately 6-17% of the general public.
- Misophonia and select sound sensitivity are other terms that have been used to describe hyperacusis. Hyperacusis is a more general term and typically easier to interpret.

## Types of hyperacusis

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Loudness hyperacusis

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Annoyance hyperacusis

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Fear hyperacusis

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Pain hyperacusis

Four categories of hyperacusis can be used to differentiate the perceptions and reactions of patients with hyperacusis. In our experience, most patients will report one or more types, though not all.

- Loudness hyperacusis – perceiving moderately loud sounds as very loud
- Annoyance hyperacusis – having a negative response such as irritation or anger to sound
- Fear hyperacusis – anticipating sounds that are uncomfortable and cause fear
- Pain hyperacusis – perceiving pain in ear or head with sound exposure

Using these categories can be helpful to learn how to manage hyperacusis. For example, patients with loudness hyperacusis may use an ear-level sound generator to gradually increase their exposure to sound. Patients with fear hyperacusis may need to work with a psychologist to change their aversions to sound through behavioral modifications.

Understanding your hyperacusis

- What is your hyperacusis experience?
- How long have you had hyperacusis?
- Does hyperacusis affect one or both ears?



We begin sessions by getting to know our patients and establishing rapport with them. You might begin by asking these questions:

- What is your hyperacusis experience?
- How long have you had hyperacusis?
- Does hyperacusis affect one or both ears?

## Your reactions to sounds

- Are there any sounds that are too loud?
- Are there any sounds that are annoying?
- Are there any sounds that cause fear?
- Are there any sounds that create pain?



In the process of getting to know and better understand each patient, asking the following questions will give you a better idea of the impact hyperacusis has on their life:

Are there any sounds that...

- Are too loud?
- Are annoying?
- Cause fear?
- Create pain?

Patients might respond to any of the above with noises such as babies crying, telephone ringing, or doors slamming.

You can also use an intake questionnaire to gather this information about trigger sounds for hyperacusis.

Your daily experience with hyperacusis

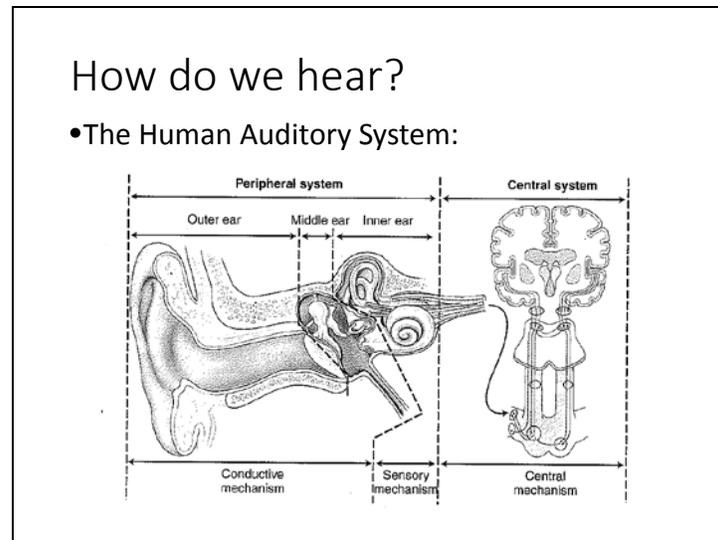
- Are there times during the day when you are particularly bothered?
- Are there times during the day when you are not bothered?
- How long do the episodes typically last after the triggering event?



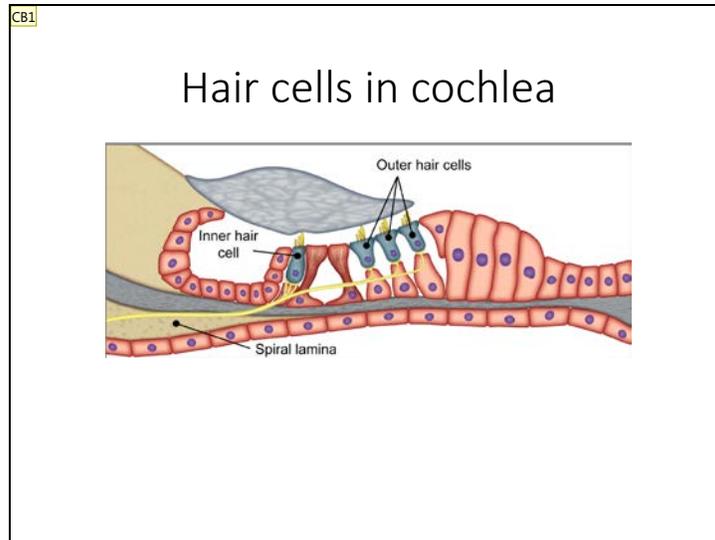
We inquire how often patients are bothered by their hyperacusis and their daily experience with it.

Patients will be different in how the hyperacusis affects them after a triggering event.

To determine their daily experience with hyperacusis, you might ask when they are or are not bothered during the day, and how long the episodes last after the trigger event.



- There are two main body systems that are involved in the process of hearing.
- The peripheral system is composed of the outer, middle, and inner ear structures. Sound waves travel through the outer ear across the tympanic membrane (eardrum), passing through the middle ear to the inner ear and the cochlea. Within the cochlea, there are small hair cells where the sound waves are converted into neural impulses.
- This marks the start of the central auditory system. The neural impulses are then carried up through the auditory nerve to the brain where they are processed.

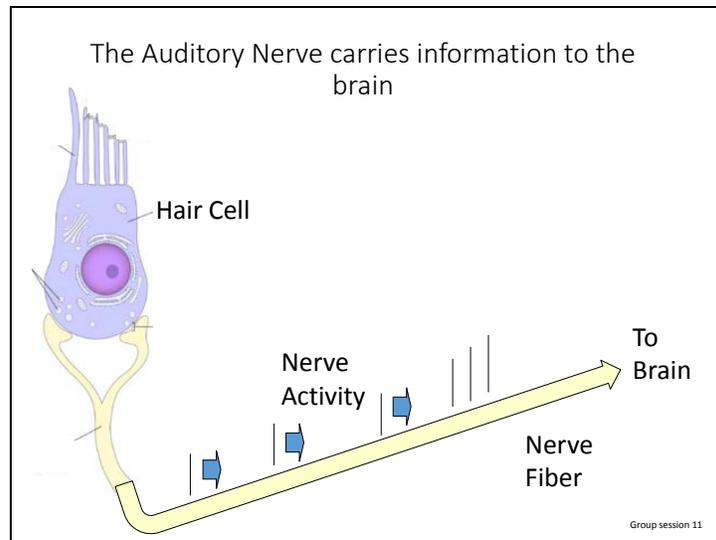


There are two types of hair cells in the cochlea, located on the basilar membrane.

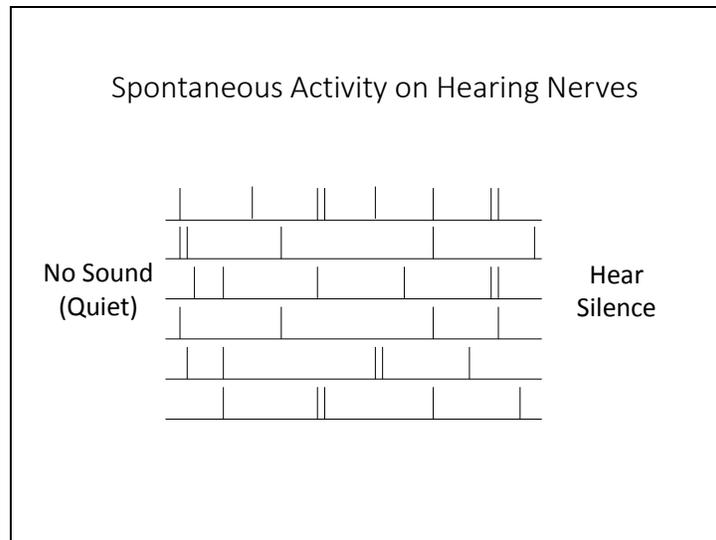
- inner hair cells numbering 3,500
- outer hair cells numbering 12,000

The hair cells are stimulated by the movement of fluids in the cochlea, and activate the hearing nerve. The job of the hair cells is code the sound frequencies that we hear.

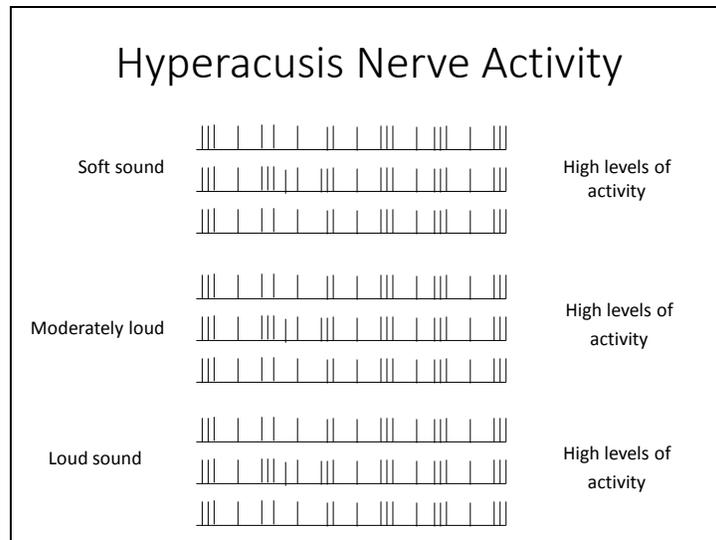
Slide 11



- Vibration of bones causes fluid in cochlea to move
- This causes tiny hairs on top of cell to move
- There is a chemical reaction between the hair cell and the nerves which causes the nerves to become active
- The nerve activity goes to brain
- Brain interprets nerve activity as sound
- Loud sounds activate more nerves than soft sounds.
  
- The vertical lines indicate nerve impulses that are sent up to the brain.



- Even when there is no sound, there is nerve activity
- This nerve activity can be measured even when you don't know it is happening
- This nerve activity is called random spontaneous activity
- No specific pattern to activity
- Ignored by brain thus not perceived as sound

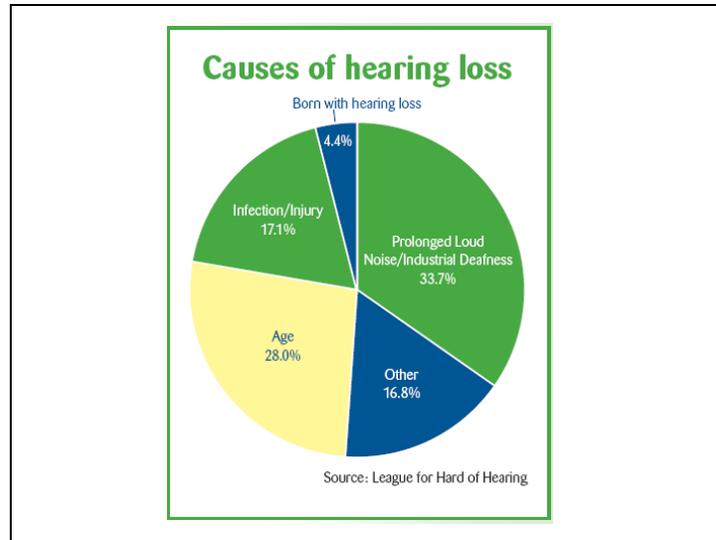


This shows the amount of nerve activity for a person with hyperacusis.

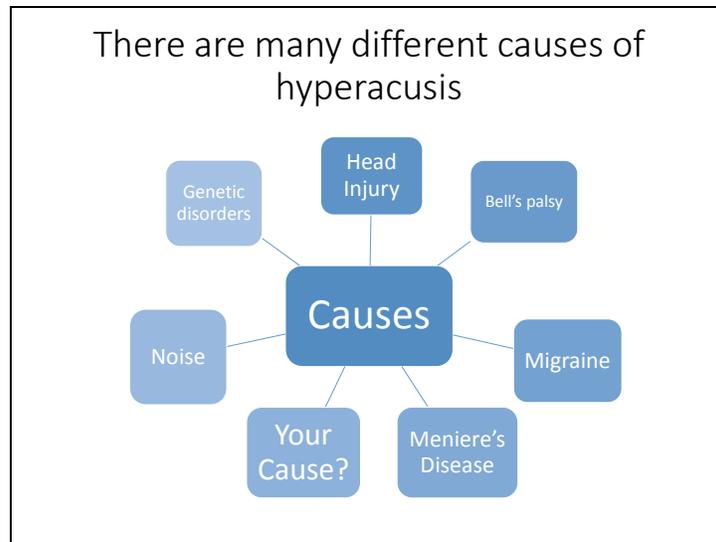
Note that there is no change in the nerve activity among the three situations of hearing a soft sound, a moderately loud sound, or a loud sound.

In patients with hyperacusis, the nerve activity will be high for all sounds, regardless of the input sound level.

Sounds that are soft, moderately loud, and loud will all be interpreted as loud by the brain.



Some patients with hyperacusis also have hearing loss, but not all.  
Having hearing loss does not mean you have hyperacusis or visa versa.



Hyperacusis has similar causes to hearing loss such as excessive noise exposure, Meniere's disease, and head injury. Other causes of hyperacusis include Bell's palsy, migraines, and genetic disorders. For children with hyperacusis, the causes may be more complicated, and include autism, Williams syndrome, among others

Reactions to hyperacusis  
(Tyler et al., 2014)

- Emotional well-being
- Hearing and communication
- Sleep
- Concentration



Hyperacusis affects four areas that can result in functional impairments such as work or social problems:

- Emotional wellbeing, causing distress, depression, anxiety, in response to a sound exposure
- Communication and hearing difficulties because it can be hard to focus on what people are saying
- Sleep disturbances
- Impacts concentration due to anticipation of being exposed to a sound

Options to treat hyperacusis

- Counseling (Hyperacusis Activities Treatment)
- Ear plugs
- Sound therapy
- Relaxation exercises
- Medications

There are several treatment options that show positive results for patients with hyperacusis. Research is still emerging about the effectiveness of these therapy approaches.

- Counseling using Hyperacusis Activities Treatment, CBT, or others
- Ear plugs to reduce sound exposure
- Sound therapy using background sound to reduce annoyance and/or increase sound tolerance
- Relaxation exercises to provide coping strategies, lessen fear and anxiety.
- Medications to manage anxiety, depression, sleep problems.

Hearing protection

- Ear plugs reduce noise exposure
  - Wear in noisy environments
- Using ear plugs every day causes communication difficulties
- Ear plugs allow you to stay active, not be reclusive



- Musician earplugs should be recommended to patients with hyperacusis.
- Ear plugs will help in noisy environments to reduce noise exposure.
- There is limited effectiveness in using them continually, including communication difficulties
- There are also negative consequences to wearing ear plugs daily, such as making hyperacusis worse as sound exposure lessens.
- However, many hyperacusis patients find relieve for noisy situations. It allows you to stay active, not be reclusive.



Sound Therapy

- Can be helpful for loudness and annoyance hyperacusis
- Options include non-wearable and ear-level sound generators
- Will take time for results

Sound therapy, or the use of background sound, can be helpful for patients with loudness or annoyance hyperacusis

Sound Therapy options include non-wearable sound generators and ear level noise generators  
Will take time to treat hyperacusis. It is not unexpected for patients to show benefit from sound therapy after 6-18 months of treatment.

### Sound Therapy Options

- Non-wearable sound generators
  - Sound Pillow
  - Sound Generators
  - Smartphone Apps
  - CDs, radio, etc
- Wearable, ear-level sound generators



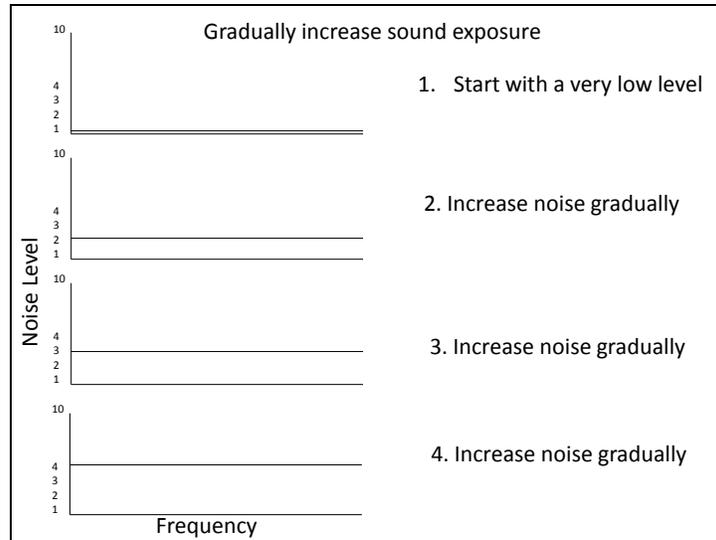
The image shows three types of sound therapy devices. On the left is a white, rectangular sound pillow. In the center is a smartphone displaying a colorful app interface with icons for 'Music', 'Sound', 'Relax', and 'Sleep'. On the right is a pair of white, over-the-ear sound generators with 'sonuby' branding.

Sound Therapy options include non-wearable sound generators:

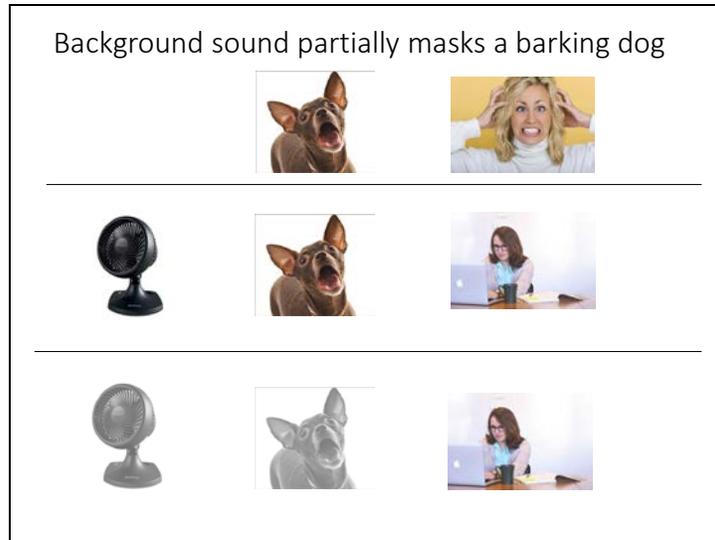
- Sound Pillow (\$50-150, [www.soundpillow.com](http://www.soundpillow.com))
- Sound Generators (\$20-50, [www.amazon.com](http://www.amazon.com))
  - Marpac Dohm Classic White Noise Sound Machine
- Smartphone apps for tinnitus relief (free)
  - Starkey, Phonak, GNResound, Oticon
- CDs, radio, etc to provide additional sound input

Ear-level sound generators include tinnitus masking devices.

- GHI offers tinnitus masking devices
- Neuromonics uses music that is customized for the patient to mask tinnitus
- Desyncra has neuromodulation that creates therapeutic tones matched to patient's tinnitus
- Widex uses (ZEN) fractal tones
- GN Resound offers a combination unit for amplification and masking tinnitus
- Signia has tinnitus sounds (modulated ocean waves + static sounds) and notch therapy



For patients with loudness hyperacusis, the **principle of successive approximations** may be applicable. The **patient listens to a low-level background sound for a prescribed time every day and increases their exposure gradually**. Increasing sound exposure gradually over several weeks to make ears more tolerant of sound, and lessen bothersome reactions.



For patients with annoyance hyperacusis, a background sound can partially mask the unwanted sound we hear.  
Here, a barking dog is the unwanted sound, and the fan is the background sound

## Progressive Muscle Relaxation

- Learn to systematically tense and relax groups of muscles
- With practice, you will recognize a tensed muscle vs. a relaxed muscle
- This skill allows you to produce physical muscular relaxation at the first signs of tension



Relaxation activities help manage stress and anxiety that is in response to environmental sounds. Progressive Muscle Relaxation is one method of practicing relaxation. It requires the patient to focus on tensing and relaxing groups of muscles. The goal is to be able to initiate muscular relaxation whenever tension arises.



## Progressive Muscle Relaxation

Completed in two steps:

1. Deliberately apply tension to certain muscle groups
2. Stop the tension and focus on how the muscles feel as they relax

There are two parts to progressive muscle relaxation. First, one must tense a specific muscle group, then release the tension and focus on how the muscles are relaxing.

## Progressive Muscle Relaxation- Practice Exercise



1. Start with your arms
2. Make a fist and tense your arms for 15 seconds
3. Release the tension
4. Breathe deeply and pay attention to the sensation of your arms relaxing

First sit or lay in a comfortable position. Then begin to tense certain muscle groups, starting with one's arms. Make a fist and contract your arm muscles for 15 seconds. Then release the tension and focus in how the muscles feels as they start to relax. Take a deep breath and continue to breath deeply.

## Practice Exercise--continued

5. Continue tensing and relaxing the following muscle groups:
  - Face
  - Shoulders
  - Stomach
  - Legs and feet
6. When finished, release any remaining tension in your body

Repeat this process of tensing and relaxing with different muscle groups, one at a time. First with your face, then shoulders, working your way down to your stomach, then finally to your legs and feet.

The last step in progressive muscle relaxation is to finally release any remaining tension in the body.

This technique will allow the patient to release tension in any part of the body whenever it arises.

## Deep breathing exercises

- Sit or lie flat in a comfortable position
- Put one hand on your belly just below your ribs and the other hand on your chest
- Take a **deep** breath in through your nose, and let your belly push your hand out
- **Breathe** out through pursed lips as if you were whistling
- Repeat 3 to 10 times



Deep breathing exercises are also useful relaxation techniques. To start you find a comfortable position either sitting or lying down. Place one hand (or a small item such as a rubber ducky) on your belly just below your ribs. Place your other hand on your chest.

Take a deep breath. In through your nose and fill your belly up. Let it push your hand or small object up. Make sure you are not filling your chest up and your other hand on your chest does not move up too.

To breath out, slowing blow the air out of your mouth, like you are blowing out a candle or blowing up a balloon.

Repeat this exercise anywhere 3-10 times make sure to take a few normal breaths in-between repetitions.

This is also a tool you can use to slow your thoughts down or take a little break where ever you are to calm yourself down.

### Visual Imagery

- Similar to daydreaming
- Attention is focused on some type of sensory experience
  - Creating novel mental images
  - Recalling past places and events



Visual imagery can also be used as a relaxation tool. It is somewhat similar to daydreaming but your attention is focused on a particular sensation. The goal is to create a story of sensations that will help ground your body. This is most commonly a peaceful image or place that calms you down.

This could be equivalent to 'going to your happy place'



Visual Imagery - Practice Exercise

1. Close your eyes
2. Think of a relaxing scene (the beach)
3. Try to imagine the scene as clearly as you can
4. The smell of the water, warm sand on feet, sound of ocean
5. Allow yourself to relax as you imagine the location in your mind

We are going to do a practice visual imagery exercise. First close your eyes. Get comfortable in your seat or laying down. We are going to start by thinking of a relaxing scene. For this particular example we will use the beach. Try to imagine the scene as clearly as you can, maybe a particular beach that you visited recently or as a child. Note the smell of the air around you, the smell of the salt water. Then focus your attention to your feet. They are in the warm sand, move your feet around, dig them into the sand. Notice the feel of the sand as it moves across your feet, notice the warmth. Listen to the sound of the waves crashing, of the birds that are flying or the noises of other activities going on. Allow yourself to relax as you explore the location in your mind, making special note of the sensory sensations around you.

When you are ready to return slowly open your eyes again. Take a moment to reorient yourself to your surroundings.

One important note for this exercise is do not create a “to do” list or let your mind drift to your worries. If this happens, gently redirect your attention back to a specific sensory sensation. Make sure to not be upset at yourself or feel guilty if this happens. As you practice more, it will be come easier to maintain your focus on the situation.

### Medications

- Currently no drug or surgery can reliably eliminate the source of hyperacusis
- There are effective drugs for:
  - Sleep, anxiety, and depression



- At this time, there are no widely accepted cures, including drugs or surgeries for hyperacusis. Medications can be helpful to relieve related symptoms.
- Medications for sleep problems, depression, or anxiety can be helpful.
- Work closely with psychiatrist or psychologist



This is a good opportunity to discuss any remaining questions with the patient.

You might do the following to support your patient:

- Set 3 goals for the counseling sessions
- Teach the patient a mantra, such as “I am ok” or “This is ok” to start countering negative thoughts
- Recognize the individual differences among patients