Thoughts and Emotions

Session 2
Overall Plan

1. Hearing and hearing loss
2. Tinnitus
3. Attention, behavior, and emotions
4. Changing your reactions
5. Activities for home
Part 1: Hearing and Hearing Loss

• How we hear and what hearing loss is
• Causes of hearing loss
How We Hear
Cochlea is like a piano

Low pitches

High pitches
Hair Cells in Cochlea
Nerve activity carries information to the brain
Spontaneous Activity on Hearing Nerves

No Sound (Quiet)

Hear Silence
Different nerve responses result in the perception of different sounds

No Sound (Quiet)

Word “Table”

Sound of a Cricket

Hear Silence

Hear “Table”

Hear a Cricket
Causes of Hearing Loss

- Noise
- Head Injury
- Medications
- Age
- Unknown?
- Disease
Hearing loss is like missing piano keys

Normal Cochlea

Cochlea with hearing loss and missing hair cells
Hair Cells

Normal

Hearing Loss
Nerve Activity

Normal Hearing

Lots of information sent to the brain

Hearing Loss

Limited information sent to the brain
Solutions for Hearing Loss

Cannot replace hair cells or nerve fibers

Hearing aids can help make sounds:
• Louder
• Easier to understand
They do not restore normal hearing
Protecting Your Hearing

• Avoid exposure to very **LOUD** sounds whenever possible
• If noise is unavoidable, wear ear protection to prevent damage to your ears
• Exposure to everyday loud sounds is okay
Your Audiogram
Your hearing?

- Do you have a significant hearing loss?
- What difficulties does your hearing loss create?
- What steps have you taken to improve your hearing?
Pitch and Loudness

- **Pitch (frequency)**
  - High pitch
  - Low pitch

- **Loudness (intensity)**
  - Loud
  - Soft
Part 2: Tinnitus

- A sound produced in your ear(s) or head
- Different sounds heard by different people (e.g. ringing, buzzing, hissing, etc.)
Tinnitus

• Tinnitus results from damage to the hearing system
  – May be associated with hearing loss

• Tinnitus will not damage your hearing

• Hearing may continue to decrease, but not because of tinnitus
There are many different causes of tinnitus:

- Noise
- Head Injury
- Medications
- Age
- Unknown?
- Disease
Tinnitus is Common

- 10 in 100 (10%) people have tinnitus
- 1 in 100 (1%) people are bothered by their tinnitus
- 20 in 100 (20%) people over 60 years old have tinnitus
• Currently no drug, surgery or other treatments can reliably eliminate the source of tinnitus

• However, you can change your reaction to tinnitus and how it affects you
Auditory System

Tinnitus, whatever the cause, must be represented in the brain in the auditory area. It is represented there like any other sound. It can be measured.
Spontaneous Nerve Activity

Normal Hearing

Hearing Loss (No Tinnitus)

Hear Silence

Hear Silence
Tinnitus is likely the result of an increase in spontaneous nerve activity.

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<th>Normal Hearing</th>
<th>Hear Silence</th>
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<th>Hearing Loss (No Tinnitus)</th>
<th>Hear Silence</th>
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<tr>
<th>Tinnitus</th>
<th>Hear Sound</th>
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</table>
What does your tinnitus sound like?

- Whistle

- Cricket

- Your tinnitus?
Part 3: Attention

• Types of attention
• How things capture our attention
• Emotional state has an effect on attention
• Habituation
Two Types of Attention

• Conscious—selectively attend to and think about information.

• Subconscious—monitor background information. However, a monitored item may grab your attention at any time and move to conscious attention.
Many stimuli compete for our attention

- Touch
- Smell
- Taste
- Vision
- Sound
Normally, we focus our attention on one stimulus at a time.
We can usually direct our conscious attention to another stimulus if we choose.
We can direct our conscious attention to different smells, sounds or things we feel.
We are not even aware that our subconscious monitoring goes on all the time.

Blah, blah, blah, Fred, blah, blah

Did I hear my name?
Several things can influence our attention

- Emotional state
- Unknown?
- Important event
- Novelty
An important sound can ‘grab’ our attention
Things that capture our attention

Unusual

Important

Scary

Unexpected
Our attention to the same stimulus can change

1. Hear police siren - Attend! TROUBLE??
2. Hear siren but car passes - No longer attend!
3. Hear siren as car stops – Attend! Uncertain of importance
Some stimuli cannot be ignored
Some background sounds initially grab our attention, but we automatically habituate to them.

New refrigerator is loud at first.

After a while it is less noticeable.

Not even aware it is present.
We notice important things and ignore unimportant stimuli

Refrigerator: Ignore

Bear: Cannot ignore

Crowd: Monitor information automatically
Tinnitus and Attention

If you determine **tinnitus is not important**, the tinnitus will be easier to habituate to

If you determine **tinnitus is important**, you will attend to it
How we attend to tinnitus

Brain

Conscious
“Hears”
“Interprets”

Attention

Memory ↔ Emotions

Brain Stem

Subconscious

Monitoring

Tinnitus

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Tinnitus Does Not

• Make you deaf
• Lead to senility
• Imply a sign of mental illness

• When you worry about such things, you can become preoccupied with tinnitus
If you decide tinnitus is not important

• It will be easier to:
  – focus your attention elsewhere
  – habituate to it

• Habituating to your tinnitus can take time
  – For some it can occur quickly
  – For others it can take several months
Activities

• Describe an image you like (e.g. a new car) and one you don’t like (e.g. a snake)
• Describe a sound you like (e.g. music) and one you don’t like (e.g. a siren)
• Describe your tinnitus
Part 4: Changing Your Reactions
Our Thoughts and Emotions

Doorbell → Neutral

Doorbell → Fire → Injury → Anxiety

Doorbell → Angry neighbor

Doorbell → Flowers → Friend → Prize → Happiness

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How to Change Our Reaction to Tinnitus

1. Change Interpretation of Importance
2. Change Emotional Reaction
3. Refocus on Other Activities
4. Reduce Contrast Between Background Sound and Tinnitus
Change Interpretation of Importance
Understanding Tinnitus

• Tinnitus is likely the result of increased spontaneous nerve activity
• Many people have tinnitus – you are not alone
• Tinnitus is not threatening your health or hearing
• Tinnitus and your reaction to tinnitus are two different things
Decreasing Attention to Tinnitus

• Our goal is to help you move from the group of people who are bothered by their tinnitus to the group of people who are not bothered by it.
Decreasing Attention

• 2 kinds of attention:
  – Conscious and Subconscious
• Background sounds are monitored all the time
  – this is normal
• We pay more attention to important, strange, or fearful sounds
• Sounds that we interpret as important will be monitored more closely
• If tinnitus is not important, it is less likely you will pay attention to it
You can change your emotional reactions

Tinnitus → Negative Thoughts → Negative Reaction

Tinnitus → Constructive thoughts → Anxiety, Irritation

Tinnitus → Constructive thoughts → Less Irritation

Tinnitus → Tinnitus not as prominent → No Reaction
Change Negative Thoughts

I hate this noise!

I can’t live the rest of my life with this noise in my head!

I can’t concentrate with this sound in my head!

I know this noise can’t harm me, so I don’t need to be afraid of it; I can learn to ignore it.

It’s OK if this noise doesn’t go away because I can learn to put it in the background.
Change Negative Thoughts

• What kind of thoughts have you had about your tinnitus?
  – Situations where tinnitus is bothersome
  – Thoughts and beliefs about tinnitus
  – Feelings about tinnitus
Connection Between Thoughts and Emotions

Feedback Loop

Tinnitus → Problem → Annoyed

Event → Interpretation/ Belief → Consequence
Refocus on Other Activities
Activities in Your Life

• What hobbies do you have?
• What activities help you ignore your tinnitus?
• What new activities could you become involved in?
Activities in Your Life

• If you are doing less in your life, does this help?
• If you keep so busy you can’t sit still, does this help?
• If you are doing this just to escape tinnitus, it is unlikely to help
  – Activities need some intrinsic value also
Reduce the Contrast Between Tinnitus and Background Sounds
Low level noise makes tinnitus more difficult to detect

Tinnitus

Low Level Noise

Tinnitus in Low Level Noise
Decrease Prominence

Tinnitus

Level

Tinnitus

Level

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Background sound partially masks a barking dog
Ways to Add Low Level Background Sound

• Use sound in the environment
Ways to Add Low Level Background Sound

• Listen to recorded material:
  – Relaxation CD’s/tapes
  – Nature sounds
  – Music

• Use a sound playing device
Do any sounds make your tinnitus less noticeable?
Part 5: Activities for Home
Activities

1. Practice focusing on your tinnitus and then on something else
2. Identify activities you would enjoy
3. Try different low-level sounds in the background
Activities

• Complete the Tinnitus Diary
  – Modify your lifestyle to engage in activities where tinnitus is less noticeable/bothersome
  – Use low-level background sound to make tinnitus less prominent
Tinnitus Diary

• Write down your thoughts and worries about tinnitus
  1. ___ My tinnitus will …________________________________________
  2. ___________________________________

• Check to see if these thoughts match what actually happens
  1. ___________________________________
  2. ___________________________________

• List the alternative ways of thinking about tinnitus that you find helpful
  e.g. I have tinnitus, but it is really a small part of my life.
  1. ________________________________
  2. ________________________________

• We will discuss your thoughts next visit.
Tinnitus Diary

- List things that reduce your tinnitus
  1. __________________
  2. __________________
  3. __________________
  4. __________________
  5. __________________
  6. __________________
  7. __________________

- List things that worsen your tinnitus
  1. __________________
  2. __________________
  3. __________________
  4. __________________
  5. __________________
  6. __________________
  7. __________________
Tinnitus Diary

• List sounds you enjoy
  1. ________________
  2. ________________
  3. ________________
  4. ________________
  5. ________________
  6. ________________
  7. ________________

• List activities you enjoy
  1. ________________
  2. ________________
  3. ________________
  4. ________________
  5. ________________
  6. ________________
  7. ________________
Tinnitus Diary

• List alternative activities to engage in when you find tinnitus bothersome
  1. __________________
  2. __________________
  3. __________________
  4. __________________
  5. __________________
  6. __________________
  7. __________________

• List any low level background sound you used & its effect on your tinnitus
  1. __________________
  2. __________________
  3. __________________
  4. __________________
  5. __________________
  6. __________________
  7. __________________
Tinnitus Diary

• For a two week time period, keep a list of new activities you engage in each day and the effect your activities have on your tinnitus.
**Tinnitus Diary**

**Week 1**

Make changes in your daily life so you are doing more activities where your tinnitus is better and fewer activities where your tinnitus is worse. List the new activities and how your tinnitus was affected.

<table>
<thead>
<tr>
<th>Activity:</th>
<th>Effect on Tinnitus:</th>
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<tbody>
<tr>
<td>Day 1____________________</td>
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## Tinnitus Diary
### Week 2

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<td>• Day 7__________________________</td>
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Tinnitus Diary

• After two weeks, stop keeping this diary.
• The goal of this diary is to help you make changes in your daily life so you are doing more activities where your tinnitus is better and fewer activities where your tinnitus is worse.
• The diary will also help you find alternative activities you may engage in to take your mind off your tinnitus.