2017 Signia Expert Series

Tinnitus Activities Treatment
Richard Tyler, Ph.D.

- This course is offered for Continuing Education Units (CEUs) for Total Access Online members.
  - Stay logged in for the duration of the course to be eligible to earn CEU credit.
  - Take the exam following course completion to earn credit.
  - For questions or assistance, contact 800-753-2165.

- Please visit the AudiologyOnline website for other live and recorded events from Signia.
  http://www.audiologyonline.com/ce/signia-siemens
Course Objectives

1. After this course, participants will be able to administer Tinnitus Activities Treatment.

2. After this course, participants will be able to appropriately fit hearing aids to patients with tinnitus and hyperacusis.

3. After this course, participants will be able to appropriately fit sound therapy devices to patients with tinnitus and hyperacusis.

Richard Tyler, Ph.D.

The University of Iowa
• What is it like to have tinnitus?

What if you heard a sound that wasn't supposed to be there?
• Unpleasant
• No control over it
• No cure!
• Nobody understands!
• Sign of serious illness?
• There for life?
DEFINITION OF TINNITUS
(AFTER McFadden, 1982)

• PERCEPTION OF SOUND
  – must be heard
• INVOLUNTARY
  – not produced intentionally
• ORIGINATES IN HEAD
  – not super hearing of an external sound

• Tinnitus is a symptom, like hearing loss

Categories of Tinnitus

• Middle ear
  – Originates in the middle ear
• Sensorineural
  – Originates in the sensorineural system

• Parallels how we diagnose and treat hearing loss

SENSORINEURAL TINNITUS

• COCHLEAR
  – VASCULAR
  – MECHANICAL
  – SENSORY
  – NEURAL
• RETROCOCHLEAR
  – NEURAL
  – BRAINSTEM
  – CENTRAL
Physiological Models of Tinnitus

- Perception, must be in Temporal Lobe
  - Increased spontaneous activity
    - Fed by increase, decrease, or edge
  - Cross-fiber correlation
    - Normal or increased spontaneous activity (Eggermont, Moller)
    - More fibers with similar best frequency following hearing loss (Salvi et al.,)

- Reaction to Tinnitus
  - Amygdala, autonomic nervous system

Theories of Tinnitus

increased spontaneous activity

<table>
<thead>
<tr>
<th>Hearing Nerve</th>
<th>Spontaneous activity in quiet normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Table&quot;</td>
<td>The word &quot;table&quot; Normal perception of sound</td>
</tr>
<tr>
<td></td>
<td>Quiet with lots of random activity Activity is heard (tinnitus)</td>
</tr>
<tr>
<td></td>
<td>No external sound - Tinnitus</td>
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</tbody>
</table>

Theories of Tinnitus – cross fiber correlation

<table>
<thead>
<tr>
<th>Normal Unrelated Activity</th>
</tr>
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<tbody>
<tr>
<td>Related Activity Across Nerve Fibers</td>
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</table>
Auditory Brain Reorganization After Hearing Loss
(AFTER SALVI, LOCKWOOD AND BURKARD)

- Hair cells destroyed
- Corresponding silent regions in brain
- After months, silent neurons respond in normal way, but to same frequencies as adjacent regions
- Over-representation of these frequency regions in brain
TINNITUS PERCEIVED
STOUFFER AND TYLER, 1990

- UNILATERAL 37%
- BILATERAL 52%
- HEAD 10%
- OUTSIDE 0.6%

Davis and Rafaie (2000)

Figure 1. Tinnitus population (millions, 2008)

Kochkin, Tyler & Born (2011)
Current Medical Treatments

• At this time, there are no widely accepted cures for tinnitus,
• There are no studies that have shown a cure that have used appropriate research designs and have been replicated by others

Medications OK for

• Anxiety
• Depression
• Sleep
THE PSYCHOLOGICAL MODEL OF TINNITUS

PITCH

- Adjust my tone so that it has the same pitch as the most prominent pitch of your tinnitus
- Method of limits, or adjustment or an adaptive method
- Test in ipsilateral or contralateral ear
- Test with monaural stimuli
- Can be highly variable

LOUDNESS

- Adjust my tone so that it has the same loudness as your tinnitus
- Methods of limits, adjustment or an adaptive method
- Test in ipsilateral with monaural stimuli
- Sensation level is not loudness
Vernon and Meikle (2000)


MASKING

• Adjust my noise so that it just covers your tinnitus
• Methods of limits, adjustment or an adaptive method
• Can test with monaural or binaural stimuli
• Can test in ipsilateral or contralateral ear
CLINICAL APPLICATIONS OF MEASUREMENTS

• patient knows you understand
• quantify change
• pitch, loudness, minimum masking level

4 possible primary functions affected by tinnitus...

—What are they???
4 possible primary areas involved
  – Emotional

4 possible primary areas involved
  – Emotional
  – Hearing

4 possible primary areas involved
  – Emotional
  – Hearing
  – Sleep
4 possible primary areas involved
– Emotional
– Hearing
– Sleep
– Concentration

Tinnitus Questionnaires

Open-ended questionnaire
(Tyler and Baker, 1983)

• Please list the difficulties you have as a result of your tinnitus
• List them in order of importance
• Allows them to list what is important to them
Tinnitus Handicap Questionnaire
(Kuk, Tyler, Russell, & Jordan, 1990)

- Validated n= 275
- 27 items, scored from 0-100
- used worldwide, translated in many languages (Google Iowa tinnitus)
- Validity & reliability independent verified by Newman et al (1996) and Dauman et al. (1998) in French
- Designed to test treatment effectiveness

Tinnitus Functional Index

- Meikle et al. (2012)
- Scored 0-10
- BUT !!!!! includes questions on Quality of Life
  - How much has your tinnitus interfered with your enjoyment of social activities?
  - Your relationships with family, friends and other people?
  - Do you feel in control in regard to your tinnitus?
- Therefore TFI not recommended

Problems Resulting from Tinnitus
World Health Organization model

Tinnitus Primary Activities Questionnaire
- Four categories (3 questions per area)
  - Thoughts and emotions, hearing, sleep, concentration
  - e.g. “I have difficulty focusing my attention on some important tasks because of tinnitus”
- Scoring form available
  - Search “Iowa Tinnitus”

Three responses to tinnitus
- Defeat
  - overwhelmed
- Control
  - Some habituation
  - Wishing for its cessation
- Accept
  - habituate
Nurturing Expectations to Help Tinnitus Patients


Expectations

• Negative
  – Less likely to seek and benefit from treatment
• Positive
  – More likely to engage in treatment and be helped
• Patient expectations are influenced by YOU

Being Perceived as a Knowledgeable Professional

• confidence in therapist and self-confidence
• well educated, degree
Demonstrate That You Understand Tinnitus

- Articulate, professional, well educated with respect to tinnitus
- Knowledgeable about tinnitus
- Has previous successful experience with tinnitus patients

Provide a Clear Therapy Plan

- Feelings of mastery - can influence outcome
- Hope that patient can be helped
- Provide a plan to reduce effects of tinnitus
- Make patient key part of the plan
- Have patient participate in designing plan

Be Sympathetic Towards the Individual

- Understand their tinnitus and the personal problems that have resulted from it
Show that You Sincerely Care

• Take time to listen
• Schedule follow-up visit
• Call if questions or difficulties arise

Counseling for Tinnitus

Rich Tyler, Ph. D.