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- Email customerservice@AudiologyOnline.com
Clinician’s Guide to Misophonia
“Shut Your Mouth!” – Sound Induced Rage

Jenna M. Pellicori-Curry, Au.D., CCC-A
Nemours Children’s Health System

Disclosures

- Presenter Disclosure: Financial: Jenna M Pellicori is employed by Nemours/Alfred I DuPont Hospital for Children. She received an honorarium for this course. Non-financial: Jenna M Pellicori has no non-financial disclosures.
- Content Disclosure: This learning event does not focus exclusively on any specific product or service.
- Sponsor Disclosure: This course is presented by AudiologyOnline.
Learning Outcomes

After this course, participants will be able to

- Identify associated risk factors, pathophysiology and characteristics consistent with a clinical diagnosis of misophonia.
- Differentiate between other decreased sound tolerance and psychoacoustic disorders such as hyperacusis, phonophobia, recruitment, tinnitus, and central auditory processing disorder.
- Determine clinically significant misophonia based on qualitative/quantitative characteristics and assessment measures.

What is Misophonia?

- Misophonia” literally translates to “hatred of sound”
  - Selective Sound Sensitivity Syndrome (Johnson, 1999)
- Neurophysiological and behavioral syndrome
  - Characterized by an immediate averse emotional and physical response to soft-repetitive pattern based sounds, which ultimately leads to maladaptive behaviors and nervous system arousal
- Effects can lead to a life of psychosocial implications:
  - Isolation - Social Dysfunction
  - Depression - Anxiety
  - Intense Suffering - Reduced Quality of Life
- Mean age of onset is approximately 12 years of age (Kumar, 2016)
Auditory & Visual Triggers

- Auditory “triggers” or acoustic stimuli characteristics:
  - Often soft-repetitive pattern based sounds
  - Common auditory triggers include:
    - Chewing
    - Pen Clicking
    - Throat Clearing
    - Keyboard Typing
    - Slurping
    - Breathing

- Non-auditory “triggers” or visual stimuli characteristics:
  - Schröder proposed the term “misokinesia”
  - Repetitive movements which elicit an aversive response
  - Visual triggers often occur when auditory triggers are paired with repetitive visual stimuli
  - Common visual triggers include:
    - Tapping hands
    - Swinging Legs
    - Jaw movements

Auditory Brain & Nervous System

- Studies suggest enhanced reactivity of the “salience network”
- Unconscious brain centers work to assign meaning to sounds:
  - Non-salient (i.e. non-meaningful) or non-threatening stimuli are often pushed to the background via a mechanism known as auditory gating
  - Salient (i.e. meaningful) or threatening sounds allow us to either attend to stimuli or activate an acute fight-or-flight response
- Patients misinterpret sounds and perceive them as threatening, in turn activating the fight/flight response (i.e., sympathetic nervous system)
  - Fight/flight: An acute stress response where the brain processes signals or events in the amygdala and hypothalamus as harmful or threatening
- Physiological changes occur including but not limited to:
  - Hormonal changes
  - Flushing
  - Increased heart rate
- Fosters overt emotional responses (i.e., anxiety, disgust, anger, rage)
Literture Review

- Misophonia: Physiological Investigations and Case Descriptions (Edelstein et al., 2013)
  - Experiment I
    - Most trigger sounds are often related to other people’s behavior
    - Patients were unbothered when trigger sounds were self-produced
  - Experiment II
    - Elevated subjective ratings towards auditory stimuli and skin conductance responses (SCRs) were congruent
      - No significant differences observed for visual-only stimuli reported
    - These findings support that misophonia is an organic disorder that elicits specific autonomic and physiological arousal
Literature Review

- A Large-Scale Study of Misophonia (Rouw & Erfanian, 2017)
  - Misophonia Physiological Response Scale (MPRS)
    - Clenched/tightened/tense muscles 90.0%
    - Increased body temperature, blood pressure, & heart rate 59.8%
    - Pressure in chest, arms, head or whole body 40.5%

- How trigger sounds affect the patient’s life?
  - 77% indicated their symptoms worsened over time

- Misophonia symptom progression over time?
  - 77% indicated their symptoms worsened over time

- Does misophonia run in families?
  - 22% indicated “yes”; 33% indicated “no”; 45% indicated “unknown”

- The mystery of autonomous sensory meridian response (ASMR) -
  - Experience feelings of relaxation and euphoria to specific auditory stimuli

- Craig Richard presented preliminary data from his ongoing study at the Shenandoah University Scholarship & Research Conference (2016)
  - ASMR affected ~62% females and ~34% males based upon data collection
  - 93% experienced relaxation; 82% calming effects; and 65% sleepiness

- Neural correlates underlying ASMR (Lochte et al., 2018):
  - Functional brain differences in those identified with ASMR vs. control group:
    - Nucleus accumbens (NAcc) – reward center
    - Dorsal anterior cingulate cortex (daCC) - emotional arousal
    - Inferior frontal gyrus (IFG) - emotional arousal
Literature Review

- The Brain Basis of Misophonia (Kumar, 2017)
  - Research supports functional brain differences in patients:
    - Increased blood-oxygen-level-dependent responses in the anterior insular cortex (AIC), bilaterally
    - Increased myelination in ventromedial prefrontal cortex (vmPFC)
    - Aberrant functional connectivity between AIC and various regions responsible for emotional processing and regulation (i.e., vmPFC, amygdala, hippocampus)
  - Autonomic nervous system arousal and physiological responsivity
  - Study suggests atypical brain networking causes patients to misinterpret trigger sounds as threatening or toxic (i.e., flight/flight) due to aberrant connectivity and abnormal salience assignment

- Diminished N1 auditory evoked potentials to oddball stimuli in misophonia patients (Schroder et al, 2014)
  - Found a smaller N1 amplitude response for deviant tones
    - N1 & P2 are the belt and para-belt of the auditory cortex within the temporal lobe (i.e. posterior superior temporal gyrus) – (Hall, 2007)
    - N1 specifically represents the patient’s sub-attentive ability for auditory detection and rudimentary discrimination.
  - Findings suggest a possible basic impairment in auditory processing
  - The authors also conclude that additional research is required; however, this finding may lend to a neurophysiological marker for diagnosing and/or identifying the condition in the future
Literature Review

• Misophonia is associated with altered brain activity in the auditory cortex and salience network (Schroder et al., 2019)
  • Methods and Materials
    • fMRI utilized to measure brain activity and changes with blood flow
    • Electrocardiography was utilized to monitor physiological changes
    • Self-report measures were utilized to evaluate emotional changes
  • Results
    • Misophonic video clips elicited anger, disgust and sadness
    • fMRI suggests increased activity in the right insula, right anterior cingulate cortex, and right superior temporal cortex
  • Discussion
    • “Audiovisual stimuli trigger anger, disgust, sadness, and physiological arousal in patients with misophonia, associated with activation of the auditory cortex and salience network.”

• Misophonia Diagnostic Criteria for New Psychiatric Disorder (Schroder & Vulnick, 2013)
  • Most common auditory trigger stimuli:
    • Eating sounds, loud breathing or nasal sounds, and finger/hand sounds
  • Symptom pattern may be related to various forms of psychopathology
  • Proposed Diagnostic Criteria:
    • Aversive and angry feelings evoked by particular sounds
    • Rare potentially aggressive outbursts
    • Recognition by the individual that behavior is excessive
    • Avoidance behaviors
    • Significant distress interferences with daily life
    • Lack of another condition to account for all symptoms
Auditory Conditions

- Audiologic differential diagnosis:
  - Decreased Sound Tolerance Disorders (DST)
    - Misophonia
    - Hyperacusis
    - Phonophobia
    - Recruitment
  - Tinnitus
  - Central Auditory Processing Disorder (CAPD)
  - Sound Intolerance
- Misophonia is primarily a diagnosis of exclusion at this time
- Not included in Diagnostic and Statistical Manual - 5th Edition (DSM-5)
Differential Diagnosis

- Phonophobia
  - “Fear of sound”
  - Psychological condition
  - Common consequence of decreased sound tolerance disorders
  - The recollection of the sound source and the patient’s psychological state can elicit and alter the emotional response

- Recommendations for treatment commonly include:
  - Cognitive behavioral therapy (CBT)
  - Exposure therapy
  - Desensitization exercises

Differential Diagnosis

- Recruitment
  - Observed in individuals with known hearing loss secondary to outer hair cell damage within the cochlea / organ of hearing
    - Always accompanied by hearing loss / peripheral damage
    - Primarily the result of sensorineural hearing loss
  - Abnormal growth perception of loud sounds resulting in discomfort
    - Reduced dynamic range effects perception of sound level
  - Schroder (2014) suggested that majority of patients diagnosed with misophonia had normal peripheral hearing
    - No direct correlation between misophonia and hearing loss; however, the two conditions may co-exist
Differential Diagnosis

- **Tinnitus**
  - Phantom perception of sound in the absence of an external sound source
  - Research suggests tinnitus is the reaction of the auditory cortex trying to compensate for damage originating in the inner ear or auditory pathway
- **Tinnitus and Misophonia** –
  - Both conditions may lead to behavioral & psychological implications
  - Limbic system involvement plays a crucial role in both conditions
  - Jastreboff (2002) reported that misophonia is reported to co-occur in ~60% of patients with tinnitus
  - Modified Tinnitus Retraining Therapy shows promise as a treatment strategy (Jastreboff, 2013)

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Differential Diagnosis

- **Central Auditory Processing Disorder (CAPD)**
  - Ears and brain don’t fully coordinate and something adversely affects how the brain recognizes and interprets speech sounds and contours
  - Is there a link between CAPD and misophonia?
    - Auditory Figure Ground Performance (filtering noise vs. triggers)
  - Differences between misophonia and CAPD
    - No autonomic nervous system arousal in patients with CAPD
    - Misophonia patients appear hyper focused and have difficulty filtering out a specific sound rather than background noise
  - Diminished N1 Auditory Evoked Potentials to Oddball Stimuli in Misophonia Patients (Schröder et al., 2014)
    - Authors suggest possible impairment in early auditory processing abilities
Differential Diagnosis

- Sound Intolerance
  - Health conditions associated with sound sensitivity and aversion:
    - Anxiety
    - Recurrent ear infections
    - Migraines
    - PTSD
    - Developmental Disorders
    - Seizure disorders
  - Refer and rule-out sensory integration disorder when concerns arise
    - In the case of SPD, sound sensitivity concerns may be secondary to the child’s overall sensory profile rather than indicate a true decreased sound tolerance disorder (i.e., sensory-over responsivity)
  - Management approaches often include:
    - Desensitization exercises
    - Exposure therapy
    - Relaxation techniques
    - Auditory integration therapy
    - Cognitive Behavioral Therapy
    - Positive reinforcement

Alternative Conditions

- Differential diagnosis of the following conditions is recommended:
  - Sensory Processing Disorder (SPD)
  - Oppositional Defiant Disorder (ODD)
  - Obsessive Compulsive Disorder and Related Disorders (OCD)
  - Neurodevelopmental Disorders (i.e., ASD)
  - Generalized Anxiety Disorder (GAD)
  - Attention Deficit Hyperactivity Disorder (ADHD)
  - Post Traumatic Stress Disorder (PTSD)
Subjective Assessment

- Case History Reports
  - Medical history (i.e., birth, genetics, surgical, medications)
  - Developmental, social, educational, and therapeutic history
  - Otologic and audiologic history (auditory concerns)
  - Sound sensitivity behaviors, onset, management
  - Psychological health

- Psychological Screener Scales
  - Generalized Anxiety Disorder (GAD-7)
  - Personal Health Questionnaire Assessment Scale (PHQ-8)

- Assessment Questionnaires
  - Sound Sensitivity Questionnaire (SSQ)
  - Misophonia Assessment Questionnaire (MAQ)
  - Amsterdam Misophonia Scale Questionnaire (“A-MISO-S”)
  - Modified Khalfa Hyperacusis Questionnaire (provider discretion)

### Personal Health Questionnaire Scale - 8

Over the last 2 weeks, how often have you been bothered by any of the following problems? (circle one number on each line)

<table>
<thead>
<tr>
<th>How often during the past 2 weeks were you bothered by...</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Little interest or pleasure in doing things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Feeling down, depressed, or hopeless</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Trouble falling or staying asleep, or sleeping too much</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Feeling tired or having little energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Poor appetite or overeating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Trouble concentrating on things, such as reading the newspaper or watching television</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CUT POINTS:**
- 5 = mild
- 10 = moderate
- 15 = moderately-severe
- 20 = severe

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### Sound Sensitivity Questionnaire

**Medical History:**
1. Have you or anyone in your family been diagnosed with or present with behaviors consistent with tinnitus? (answer yes or no)
2. Have you or anyone in your family ever been diagnosed with an auditory processing disorder or hearing loss? (answer yes or no)
3. Has your child ever been diagnosed with sensory integration sensory processing dysfunction? (answer yes or no)
4. Has your child ever been diagnosed with brain injury, head cold, or ear? (answer yes or no)
5. In the past 12 months has your child experienced a concussion, traumatic brain injury, recent head injury, head trauma? (answer yes or no)

**Sound Sensitivity History:**
1. Does your child report their hearing, hearing, having, or hearing sounds in their ears or head? (answer yes or no)
2. Is your child afraid of certain sounds? (e.g., fireworks, echo, echo, echo) (answer yes or no)
3. Can he or she identify sounds that he or she notices? (e.g., roof, roof, roof) (answer yes or no)
4. Does your child have a fear of certain sounds? (e.g., hearing, hearing, hearing) (answer yes or no)
5. Are there specific repetitive sounds that your child or family is sensitive to? (e.g., hearing, hearing, hearing) (answer yes or no)

**Auditory Behaviors and Characteristics:**
- Rate and circle 0 to 2 with the following scale and please check all that apply:
  - 0 = Does not exist
  - 1 = Slightly noticeable
  - 2 = Noticeable

**Behavioral Characteristics:**
- Difficulty with talking, reading, or writing
- Difficulty following written directions
- Difficulty following verbal instructions
- Sensitivity to loud sounds
- Aggression in reaction to noisy places
- Sensitivity to background sounds
- Difficulty with verbal instruction
- Difficulty with written instructions
- Difficulty with written instructions
### Amsterdam Misophonia Scale (A-MISO-S)

The characteristic of misophonia varies among individuals, and it is important to understand how this condition affects each person. The Amsterdam Misophonia Scale (A-MISO-S) is a tool designed to assess the severity of misophonia symptoms.

#### SEVERITY SCALE:
- 0-4 = Subclinical
- 5-9 = Mild
- 10-14 = Moderate
- 15-19 = Severe
- 20-24 = Extreme

#### Rating Scale:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>My sound issues currently make me unhappy</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>2.</td>
<td>My sound issues currently create problems for me</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>3.</td>
<td>My sound issues have recently made me feel angry,</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>4.</td>
<td>I feel that no one understands my problems with certain sounds</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>5.</td>
<td>My sound issues do not seem to be a serious cause for concern</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>6.</td>
<td>My sound issues currently make me feel helpless</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>7.</td>
<td>My sound issues currently interfere with my social life</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>8.</td>
<td>My sound issues currently make me feel isolated</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>9.</td>
<td>My sound issues have recently created problems for me in groups</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>10.</td>
<td>My sound issues negatively affect my work/school life (currently or recently)</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>11.</td>
<td>My sound issues currently make me feel frustrated</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>12.</td>
<td>My sound issues currently impact my online life negatively</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>13.</td>
<td>My sound issues have recently made me feel guilty</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>14.</td>
<td>My sound issues are classified as &quot;crazy&quot;</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>15.</td>
<td>I feel that no one can help me with my sound issues</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>16.</td>
<td>My sound issues currently make me feel hopeless</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>17.</td>
<td>I feel that my sound issues will only get worse with time</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>18.</td>
<td>My sound issues currently impact my family relationships</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>19.</td>
<td>My sound issues have recently affected my ability to be with other people</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>20.</td>
<td>My sound issues have not been recognized as legitimate</td>
<td>0, 1, 2</td>
</tr>
</tbody>
</table>

For each item, rate the severity from 0 to 4, where 0 = not at all and 4 = a lot. Sum the scores to get the total severity score.
Audiological Assessment

- Otoscopy
- Tympanometry (226 Hz)
- Ipsilateral & Contralateral Acoustic Reflex Testing
- Distortion Product Otoacoustic Emissions (DPOAE(s))
- Pure-tone air audiometric testing from 250-8,000Hz
  - Ultra-high frequency assessment from 9,000-20,000 Hz
- Loudness Discomfort Level (LDL) Testing
  - Positive for Hyperacusis Criterion (Goldstein & Shulman, 1996):
    - LDL is 90 dB or less at two or more frequencies
    - Dynamic range is 55 dB or less at any frequency
    - Subjective complaints for sound sensitivity as evidenced by the Modified Kalfa and/or case history reports
- Bamford-Kowal-Bench – Speech-in-noise Test (BKB-SIN)

Self-Assessment Tools

- Misophonia Assessment Questionnaire (MAQ) *
- Amsterdam Misophonia Scale (A-MISO-S) *
- Misophonia Coping Responses
- Misophonia Emotional Responses
- Misophonia Physiological Response Scale (MPRS)
- Misophonia Activation Scale (MAS-1)
- Misophonia Questionnaire (MQ)
- Misophonia Impact Survey (MIS)
- Misophonia Family/Significant Other Assessment Questionnaire

Misophonia Physiological Response Scale

Misophonia Physiological Response Scale (MPRS)
by Natan Baum, revised by Tom Dozier

Please select the most correct descriptions of your reaction to your misophonia trigger sounds. (Select all levels that apply)

<table>
<thead>
<tr>
<th>Level</th>
<th>Physical Reaction to Trigger Sounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I feel no physical sensation and can ignore it.</td>
</tr>
<tr>
<td>1</td>
<td>I feel minimal physical sensation and can ignore it.</td>
</tr>
<tr>
<td>2</td>
<td>I feel some physical sensation but can often/always ignore it.</td>
</tr>
<tr>
<td>3</td>
<td>I feel some physical sensation but have difficulty or cannot ignore it.</td>
</tr>
<tr>
<td>4</td>
<td>I feel elevated physical sensation and usually cannot ignore it.</td>
</tr>
<tr>
<td>5</td>
<td>I feel elevated physical sensation and definitely cannot ignore it.</td>
</tr>
<tr>
<td>6</td>
<td>I feel elevated physical sensation, cannot ignore it, and have negative emotions.</td>
</tr>
<tr>
<td>7</td>
<td>I feel elevated physical sensation, cannot cope with it, and have strong negative emotions.</td>
</tr>
<tr>
<td>8</td>
<td>I feel physical sensation which can be best described as emotional pain and causes very strong emotions.</td>
</tr>
<tr>
<td>9</td>
<td>I feel physical sensation which can be best described as physical pain and causes extreme negative emotions.</td>
</tr>
<tr>
<td>10</td>
<td>I feel physical sensation which can be best described as severe physical pain and overpowering emotions.</td>
</tr>
<tr>
<td>11</td>
<td>I have no physical sensation but immediately get angry at the person making the sound.</td>
</tr>
<tr>
<td>12</td>
<td>I have no physical sensation but immediately have rage at the person making the sound.</td>
</tr>
</tbody>
</table>


Misophonia Family/Significant Other Assessment

Misophonia Family-Significant Other Assessment Questionnaire

The F-MAQ, 2012, Dr. Marilyn Johnson, AuD, can be used with permission.

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sound sensitivity issues significantly impact our family's happiness.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>2. Sound sensitivity issues have significantly changed our regular family lifestyle.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>3. Sound sensitivity issues negatively impact our family's regular routines or habits.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>4. Sound sensitivity issues and negative impact are greater at home.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>5. Sound sensitivity issues and negative impact are greater outside the home.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>6. Sound sensitivity issues have impacted my marital life (routine habits and behaviors).</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>7. Sound sensitivity issues have created significant stress between partners or adult members of the family.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>8. Sound sensitivity issues have created significant stress between siblings.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>9. Sound sensitivity issues have resulted in verbal arguments.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>10. Sound sensitivity issues have resulted in physical violence or attempted violence or threats of violence.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>11. Sound sensitivity issues disrupt our normal routines at home.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>12. Sound sensitivity issues disrupt our normal routines at home.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>13. I am one of the main triggers for the affected person.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>14. I can safely assess or vary my own behavior as a response to avoid triggering someone else.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15. I feel that the sound sometimes differs from other reactions if they wanted.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16. I often try to work through and try to help.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17. We have to prepare in advance and effective treatment for our family members.</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18. I am worried or anxious about the future of our family life and the impact this condition will have.</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>

Misophonia Impact Survey

1. Rate how misophonia has interfered with family life in the past 2 weeks. (If you have avoided these activities because of misophonia, include that factor in your rating.)

2. Rate how misophonia has interfered with intimate relationships in the past 2 weeks. (If you have avoided these activities because of misophonia, include that factor in your rating.)

3. Rate how misophonia has interfered with your social life and leisure activities with others in the past 2 weeks. (If you have avoided these activities because of misophonia, include that factor in your rating.)

4. Rate how misophonia has interfered with your work/school work, including unpaid volunteer work, training, or similar activities in the past 2 weeks. (If you have avoided these activities because of misophonia, include that factor in your rating.)

5. Rate how misophonia has interfered with your individual activities and alone time in the past 2 weeks. (If you have avoided certain activities because of misophonia, include that factor in your rating.)

Misophonia Questionnaire

Management Strategies

- **Referrals / Multidisciplinary Team:**

<table>
<thead>
<tr>
<th>Audiology</th>
<th>Occupational Therapy</th>
<th>Psychology/Psychiatry</th>
<th>Primary Care Physician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential diagnosis between alternative auditory conditions</td>
<td>Rule out underlying sensory processing (SPD)</td>
<td>Stress reduction therapies and coping strategies</td>
<td>Assist in managing or treating co-occurring or co-existing conditions (i.e., anxiety &amp; depression)</td>
</tr>
<tr>
<td>Misophonia Retraining Therapy (modified TRT) - Directive and Informational Counseling - Sound therapy implementation (i.e., sound generators)</td>
<td>Auditory training therapies (anecdotal) - Tomatis Method - iLs Safe &amp; Sound Protocol - iLs Focus (Sensorimotor)</td>
<td>Behavioral Approaches - Cognitive Behavioral Therapy - Exposure Therapy - Counter-Conditioning - Systematic Desensitization</td>
<td>Monitor health and encourage healthy lifestyle habits (i.e., diet &amp; exercise)</td>
</tr>
<tr>
<td>Hearing protection (i.e. musician earplugs)</td>
<td>Self-regulation strategies - including implementation of a sensory diet</td>
<td>Biofeedback</td>
<td></td>
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</tbody>
</table>
Misophonia Protocol

- Treatment for Decreased Sound Tolerance (Jastreboff, 2014)
  - Category 1
    - Patient controls selected stimulus and sound level
    - Select and attentively listen to a pleasant sound at a comfortable level and gradually increase the sound level over 3 weeks
  - Category 2
    - Patient controls selected stimulus but has only partial control of sound level
    - Someone else selects what is deemed to be an appropriate sound level and the patient provides feedback at the end of each session, so that the sound level can be adjusted for future sessions
  - Category 3
    - Patient has some control of selected stimulus but sound level is no longer in their control
    - Participate in enjoyable activities that expose patient to a variety of additional sounds - Patient may leave environments causing discomfort but should re-enter following a break
  - Category 4
    - Patient has no control over selected stimulus or sound level – this phase directly targets offensive stimuli and combines trigger cues with positive/enjoyable auditory stimuli and experiences
    - Pleasurable sound will initially be set higher than the offensive sound; however, over time the enjoyable sound will be decreased as tolerance to the offensive


Behavioral Approaches

- Cognitive Behavioral Therapy
  - Change the negative thought processes, behaviors, or emotions
- Counter-Conditioning
  - Modify the negative emotional response to a stimulus into a more positive response – allowing triggers to be more bearable or less unpleasant
  - Neural Re-patterning Technique - Trigger Tamer application (Dozier, 2015)
- Systematic Desensitization
  - Relaxation techniques and controlled gradual exposure in order to foster a weakened or more neutral emotional response to the stimulus
- Exposure Therapy (Habituation)
  - Emotional arousal and physiological responsiveness decrease naturally in response to repeated exposure to auditory or visual triggers
  - Controversial treatment – no scientifically controlled validated research

Continued
Barriers to treatment

- No universally agreed upon diagnostic criteria
- Primarily a diagnosis of exclusion
- Not recognized by The Diagnostic and Statistical Manual – 5th Ed. (DSM-V)
- Not recognized by The American Psychology Association (APA)
- Not recognized as a billable condition
- Lack of awareness in medical profession and confusion regarding referrals
- No controlled studies regarding therapeutic management strategies
- No scientifically validated self-assessment tools

Further Research

- Identifying a diagnostic bio-marker for identifying the condition
- Epidemiologic studies regarding prevalence and incidence
- Could there be an underlying genetic or epigenetic predisposition?
- Could specific conditions increase susceptibility of misophonia or impact the severity of the condition? (Brout et al., 2018)
- Scientifically validated research regarding therapeutic treatments
- Should misophonia be classified as an independent condition or is it a symptom or phenomenon of an alternative disorder?
- Deconstructing acoustic patterns and properties of triggers
- Is there a correlation between ASMR and misophonia?
- Pharmacological intervention for managing symptomology
Summary

- Research suggests a distinct difference in the characteristics associated with misophonia in comparison to alternative psychiatric disorders (Brout et al., 2018)
- Patients experience negative affective states including anger, rage, disgust, and anxiety
- Physiological measurements support increased sympathetic autonomic nervous system arousal (fight-or-flight) in response to specific stimuli (Edelstein et al., 2013)
- Functional brain changes, aberrant connectivity and salience have been documented, in parts of the brain responsible for emotional regulation, associative learning, and memory (Kumar et al., 2017)
- Studies suggest the possibility of central auditory processing impairments in patients with misophonia (Schroder et al., 2019)
- A collaborative team-based approach is recommended at this time until further scientifically validated research is established regarding treatment modalities
References

- Jastreboff, Margaret and Jastreboff, Paweł. (2002). Decreased Sound Tolerance and Tinnitus Retraining Therapy (TRT). Australian and New Zealand Journal of Audiology. 24. 74-84. 10.1375/aud2.42.2.74.31105.
Questions