

Frequency Discrimination Task

1. Pre-Assessment and Baseline Evaluation

- **Comprehensive Case History:**
Gather detailed information about the patient's tinnitus history, including onset, duration, perceived severity, and any associated symptoms.
 - **Audiological Assessment:**
 - Conduct pure-tone audiometry to establish hearing thresholds.
 - Perform tinnitus pitch and loudness matching to identify the dominant tinnitus frequency and its characteristics.
 - **Baseline Questionnaires:**
Use standardized questionnaires (e.g., Tinnitus Handicap Inventory) to document the patient's subjective experience and impact on quality of life.
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2. Equipment and Environment Setup

- **Calibrated Audio Delivery:**
 - Use a computer-based system or dedicated auditory training software that can deliver pure tones with high precision.
 - Ensure all equipment (headphones/speakers) is calibrated for consistent intensity and frequency output.
 - **Controlled Environment:**
Set up in a quiet, distraction-free room to ensure that external noise does not interfere with the training sessions.
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3. Designing the Frequency Discrimination Task

- **Task Parameters:**
 - **Tone Pair Generation:** Generate pairs of tones that differ in frequency by a small, controlled amount.
 - **Starting Difference:** Begin with a frequency difference that is clearly perceptible (above the patient's just-noticeable difference).
 - **Task Format:** Use a two-alternative forced-choice paradigm (e.g., "Which tone is higher?" or "Are these tones the same or different?").
 - **Personalization:**
If possible, tailor the frequency range to include or surround the patient's tinnitus frequency. This may help direct the patient's auditory attention and encourage cortical reorganization.
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4. Conducting the Training Sessions

- **Instructions and Demonstration:**
 - Clearly explain the task to the patient, including the response method (e.g., via button press or verbal response).
 - Provide a few practice trials to ensure the patient understands the procedure.
 - **Session Structure:**
 - **Duration:** Typical sessions might last 20–30 minutes.
 - **Frequency:** Sessions can be scheduled 3–5 times per week.
 - **Feedback:** Provide immediate feedback on each response to help reinforce correct discrimination.
 - **Adaptive Difficulty:**

As the patient’s discrimination ability improves, gradually reduce the difference between tone pairs to challenge their auditory system further.
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5. Monitoring Progress and Adjusting the Protocol

- **Interim Assessments:**
 - Re-administer tinnitus questionnaires and, if applicable, repeat pitch/loudness matching at regular intervals (e.g., weekly or biweekly).
 - Monitor any changes in the patient’s ability to discriminate tones as well as subjective tinnitus loudness or distress.
 - **Adjustments:**
 - Modify the difficulty level or session duration based on patient performance and feedback.
 - If progress stalls, consider integrating complementary auditory training tasks or exploring alternative therapeutic approaches.
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6. Post-Treatment Evaluation and Follow-Up

- **Final Assessment:**

At the end of the treatment course (which may last several weeks to months), conduct a full re-evaluation using the same methods as in the baseline assessment.
 - **Outcome Measurement:**

Compare pre- and post-treatment data to assess improvements in frequency discrimination ability and any reduction in tinnitus severity.
 - **Long-Term Follow-Up:**

Schedule follow-up sessions to monitor maintenance of treatment gains and to determine if additional booster sessions are needed.
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7. Additional Considerations

- **Patient Education:**
Ensure the patient understands the purpose of the exercise and the role of auditory training in promoting neuroplasticity.
- **Multidisciplinary Approach:**
Recognize that tinnitus management is often most effective when combined with other interventions (e.g., cognitive behavioral therapy, sound therapy).
- **Documentation:**
Keep detailed records of each session, including parameters used, patient responses, and any adjustments made to the protocol.