

Tinnitus = 15% globally

- “Phantom auditory perception”
- No known cure
- **Tinnitus retraining therapy (TRT)** is an effective management technique
- TRT is not widely offered or known
- **eTRT – Clinical Decision Support System for TRT visit diagnosis and treatment**

Data gathered; eTRT system infers accurate diagnosis

The eTRT main interface is divided into three main sections: Visit, Diagnosis, and Treatment. The Visit section includes fields for Patient Information (Test Patient 4, Visit 0, THC: 20) and Visit Data (Problem: T, Category: 1, Protocol: 1). The Diagnosis section has buttons for Interview, Audiology, Medical, and Diagnose. The Treatment section has buttons for Instrument Details, REM Details, Counsel, and Recommend Treatment. A red arrow points from the Recommend Treatment button to the expanded decision data window.

The eTRT Diagnosis Inference window displays patient information (Test Patient 4, THC: 20) and the primary diagnosis (Category: 1, Confidence: 94.4%). It also lists other diagnoses with their confidence and explanations.

Cat...	Confidence	Explanation
1	93.80000...	R3 in range <15;20) and T severity >= 8
1	73.69999...	Patient feels frustrated because of tinnitus(THI-E10) but ti...
1	60.29999...	Patient is often irritable by tinnitus(THI-E14) and tinnitus ...

Sample machine learned association rule built in eTRT knowledge base:
IF $R3(<15;20))$ AND $T_{an} \geq 8$
THEN $Category(1)$, Conf.= 94.4%

ML Action Rules for Treatment Recommendation

The eTRT Treatment Recommendations window displays patient information (Test Patient 4, THC: 20) and the primary recommendation (Actions: change instrument from GHS to GHI, use it for 9-14 weeks, Gain: 34.8%). It also lists other recommendations with their improvement and explanation.

Recommended Actions	Impro...	Explanation
Change Freq_LE from <2800;3000) to <267...	8.4	Instrument used GHS

The Expanded Decision Data window displays the recommended actions (Change Freq_LE from 2800;3000) to 2670;2800) in REM, improvement (8.4), and explanation (Instrument used GHS).

Sample machine learned action rule built in eTRT knowledge base:
IF $Ins(GHS): (Freq_LE(<2800;3000) \rightarrow (<2670;2800))$
THEN $Change(better)$, DConf. = 8.4 pp

