

# ***59 MEDICAL WING***

## ***Air Education and Training Command***

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*Integrity - Service - Excellence*

### **Wilford Hall Medical Center Lackland AFB, Texas**

#### **Tinnitus: Assessment and Treatment Options**

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# Overview



- **Description and military relevance of tinnitus**
- **TRT/TAT**
  - Theory
  - Assessment
  - Treatment Methods
- **Neuromonics**
  - Theory
  - Assessment
  - Treatment Methods
- **Summary**



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# Tinnitus Overview



- **Definition of Tinnitus: Perception of a sound in the absence of a corresponding external noise**
- **36 million suffer from tinnitus according to the American Academy of Otolaryngology Head and Neck Surgery**



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# Tinnitus Overview



- **400,000 Veterans on tinnitus disability**
- **Military Relevance**
  - **Compensation payments nearly \$190 million annually for veterans with tinnitus as main disability**
  - **Military has 2 to 5 times higher rates for STS shifts than industrial hearing conservation programs**
- **Committee on Noise-Induced Hearing Loss and Tinnitus Associated with Military Service from World War II to Present (2005)**



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# Theory Modalities



- **Tinnitus Retraining Therapy (TRT)**
  - **Dr. Pawel Jastreboff – 1990**
- **Tinnitus Awareness Therapy (TAT)**
  - **Dr. Richard Tyler- Revised 2006**



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# Assessment



- **Tinnitus case history**
- **Tinnitus Questionnaire**
- **Tympanometry**
- **OAEs**
- **Puretone/Speech audiometry including: air, bone, SRT, Word recognition**



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# Assessment



- **Loudness Discomfort Levels (LDLs)**
- **Pitch Matching**
- **Loudness Matching**
- **Minimum Masking Levels**
- **Residual Inhibition**



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# Treatment Methods



## ■ TRT

- Combination of low level broad band noise and direct counseling to achieve habituation of tinnitus
- Treatment takes approximately 18 months

## ■ TAT

- Considers body's reaction to Tinnitus – Based upon Drs. Wilson and Henry's work in Australia
  - Thoughts and Emotions
  - Hearing and Communication
  - Sleep
  - Concentration



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# Neuromonics



- **Inventor: Paul Davis, PhD - Curtin University, Perth, Australia**
- **Neuromonics formed in 2001**
- **FDA clearance 2005**
- **Neuromonics began to pursue the VA in 2007**
  - **VA Price: \$2,295.00**



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# Neuromonics Theory



**Audiological Response**

**Psychological Response**

**Neurological Response**



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# Neuromonics Theory



- **Perception**
  - **Device uses a wide frequency music/noise stimulus customized for patient's hearing loss**
- **Attention**
  - **Exposing patient to tinnitus in the context of relaxation**
- **Positive Reaction**
  - **Relaxing music and counseling**



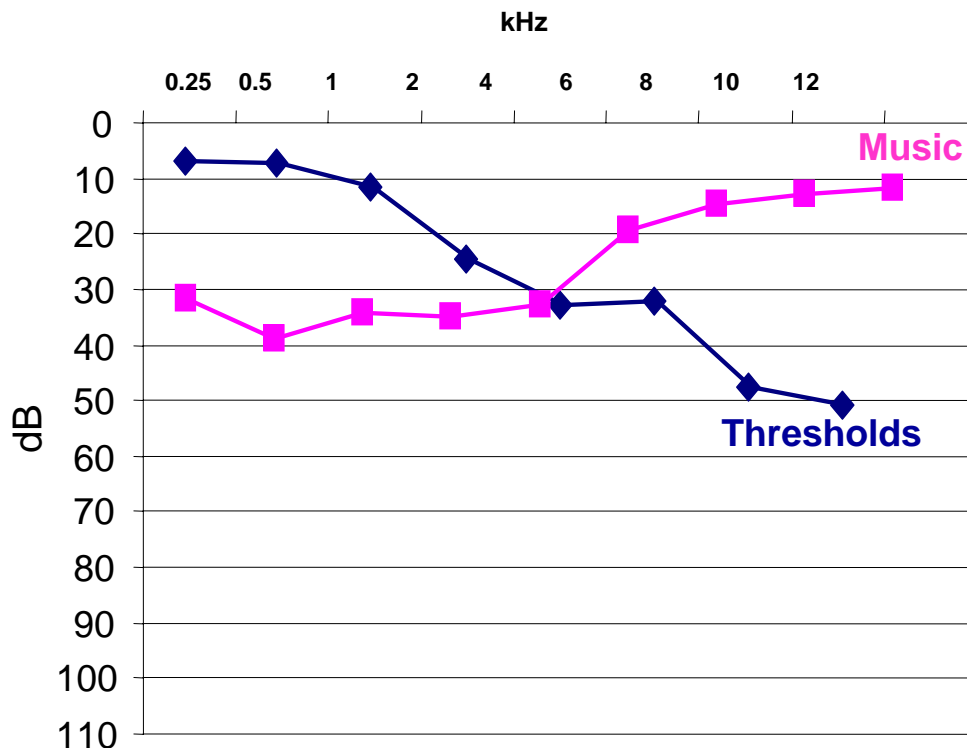
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# Neuromonics Theory



■ So you might be asking yourself two questions:

1. Hasn't music been used before for tinnitus treatment?
2. Isn't music a broadband stimulus?



Source: Neuromonics



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# Assessment



## ■ Differences

- Tinnitus Reaction Questionnaire (TRQ): Wilson et al. 1991
- High frequency testing: 10,000 and 12,500 Hz
- MML (both broadband noise and narrowband noise)



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# Assessment



## Assessment Form

Client Name:

Date of Birth:

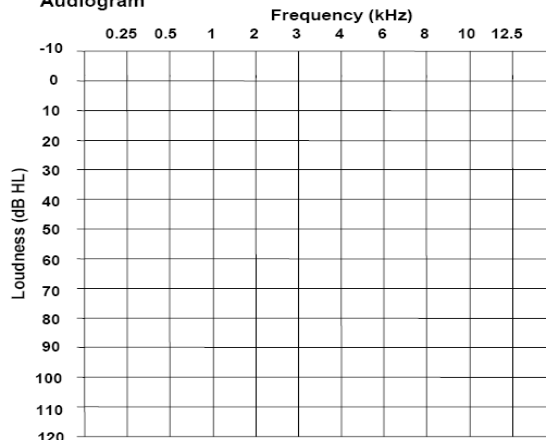
PID:

Clinician Name:

Otoscopy	Comment
Left	
Right	

Tympanometry	Type	Vol. (ml)	Comp. (ml)	Pressure daPa
Left				
Right				

## Audiogram



### Legend

Right Air O X Left Air  
 Right Bone < > Left Bone  
 LDL Left L J LDL Right

### Audio Upload (\*optional)

Freq (kHz)	Left	Right
0.25		
0.5		
0.75*		
1		
1.5*		
2		
3		
4		
6		
8		
9*		
10		
12.5		

### Tinnitus Pitch Match (contra-lateral to tinnitus ear)

Tinnitus Ear L R  
 Tinnitus pitch \_\_\_ kHz PT / NBN

## Tinnitus Assessment

	Date:	Date:	Date:	Date:
1. TRQ Score (0-104)				
2. Tinnitus Awareness%	%	%	%	%
3. Tinnitus Disturbance%	%	%	%	%
4. Subjective Tn Comment				
5. Tinnitus Loudness Match (Presented to ear contra-lateral to most prominent tinnitus)			L R	
HTL Threshold (2dB steps)				
Loudness Match				
Sensation Level				
6. BBN Minimum Masking Level (Presented to ear ipsi-lateral to most prominent tinnitus)			L R	
BBN Threshold (2dB steps)				
Masking Threshold				
Sensation Level				
7. NBN Minimum Masking Level (Presented to ear ipsi-lateral to most prominent tinnitus)			L R	
NBN Threshold (2dB steps)				
Masking Threshold				
Sensation Level				



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# Assessment



Client Name:

Date of Birth:

### Loudness Sensitivity

	Date:		Date:		Date:		Date:	
	Left	Right	Left	Right	Left	Right	Left	Right
0.5 kHz								
1 kHz								
4 kHz								
Other (    kHz)								

From Testing and History there are indications of

Normal Sound Tolerance (>90dB)     Decreased Sound Tolerance (70-90dB)     Hyperacusis (<70dB)  
 Misophonia     Phonophobia     Reactive Tinnitus

Comments:

### Residual Inhibition

Level	L:	R:	L:	R:	L:	R:	L:	R:
Complete RI								
Partial RI:								

Treatment Progress			
Satisfactory/Indeterminate/Unsatisfactory			

### Treatment Recommendation

(Audiogram) Results obtained today show...

Normal hearing bilaterally  (tick)

Disturbance: **Significant/Mild** level of tinnitus disturbance (circle)

Loudness Sensitivity: **more/no more** sensitive than the average person (circle)

Recommend Treatment: **Yes (highly suitable/suitable - circle)** 1. Low TRQ 2. Unilateral 3. Tinnitus Coach

Rationale:

Optional Paragraphs: (4) ENT advisable (5) **Should see ENT** (6) ENT advisable (\_\_\_\_years ago)

(7) May need TMJ (reason\_\_\_\_\_) (8) Additional Counseling (TRQ>70)

(9) Compensation claim (reason\_\_\_\_\_)

(10) Hearing Aids following Neuromonics (11) Hearing Aids during Neuromonics

No Rationale: (1) Severity of hearing loss (2) Low TRQ (3) Ménière's (4) Cure (5) Mindset

Optional paragraphs: (6) Hearing Aids (7) **Should see ENT** (8) ENT advisable (\_\_\_\_years ago) (9) ENT advisable



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# Treatment Methods



## ■ Neuromonics

### ■ Treatment recommendation

- Highly suitable, suitable with non-standard factors, unsuitable
- Recommend hearing aids, neuromonics or hearing aids and neuromonics

### ■ Fitting device

- 4 tracks (2 classical tracks, 2 nature/new age tracks)
- Phase 1 (approximately 8 weeks)
- Phase 2 (approximately 18 weeks)



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# Other considerations



- Price
- Research
  - Davis, P, Paki, B, Hanley, P. (2007). Neuromonics Tinnitus Treatment: Third Clinical Trial. *Ear and Hearing*, 28, 242-259
  - Unbiased research conducted by the military
- Long term benefit



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# Summary



- **Description and military relevance of tinnitus**
- **TRT/TAT versus Neuromonics**
  - **Theories**
  - **Assessment**
  - **Treatment methods**