
# *MelMedtronics Holdings, LLC*

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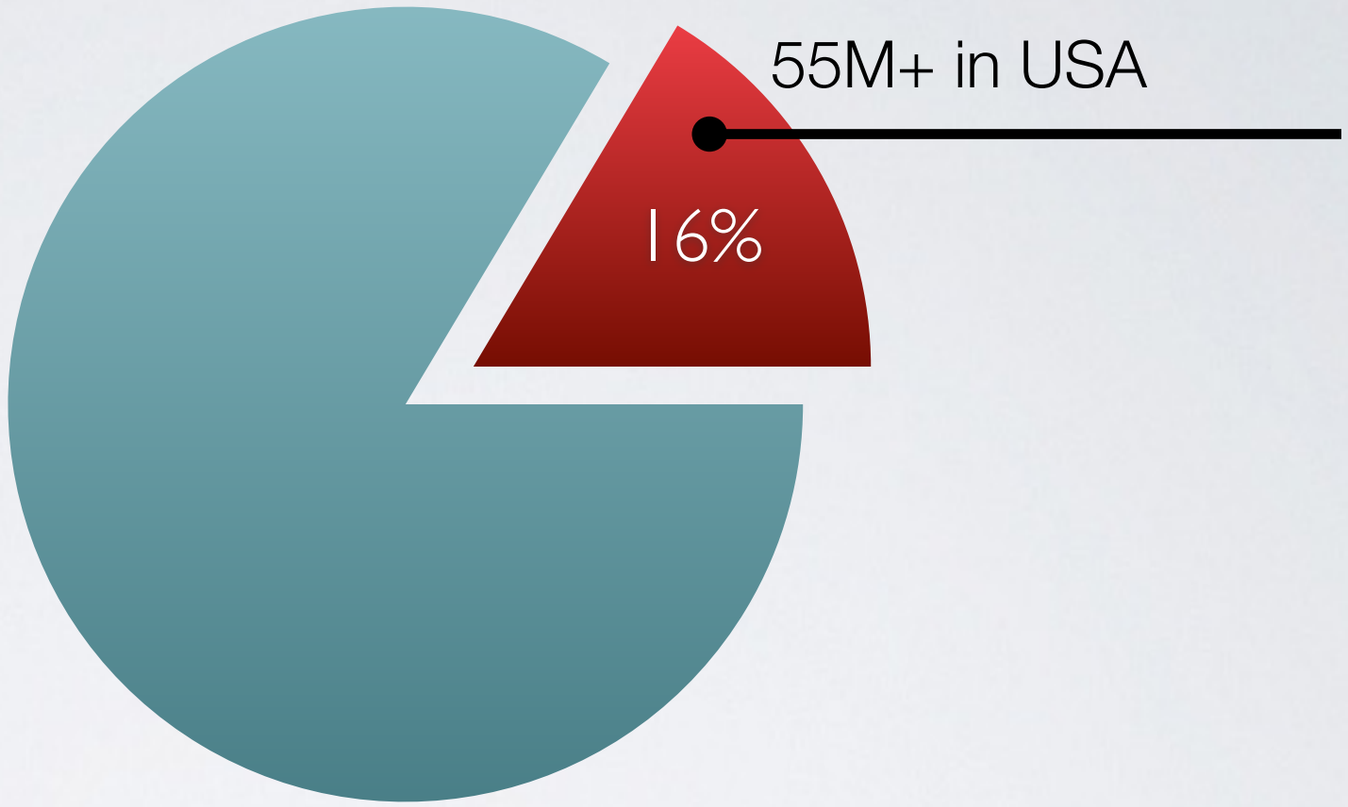
# TINNITUS PREVALENCE

*600M+ People Worldwide*




- 15% of world-wide population has has tinnitus
- 26.7% people ages 65-84 years suffer tinnitus
- 55M just in USA

# TINNITUS: ISSUES

Clinicians who see patients with tinnitus share a common axiom:

***"If you've seen one tinnitus patient, you've seen one tinnitus patient."***

Patients with tinnitus are very complex for more reasons than can possibly be listed, but here are a few examples:

- 600+ prescription drugs have a tinnitus side effect
- Tinnitus effects of interactions among multiple drugs are unknown
- 200+ known medical conditions
- Variety of frequency and intensity parameters of noise induced tinnitus

# TINNITUS: VARIABLES

- **Personality Type Reactions (Jung)**
  - Sensing-Judging
  - Sensing-Perceiving
  - Intuitive-Feelers
  - Intuitive-Thinkers
- **Anxiety**
- **Depression**
- **Hyperacusis:** reduction of normal tolerance for everyday sounds
- **Misophonia:** hatred of sound
- **Phonophobia:** pathological fear of sound, or of speaking aloud

# TINNITUS: CURRENT SOLUTIONS

## CURRENT TREATMENTS

- Sound therapy: Maskers
- Hearing Aids: amplify ambient noise
- Homeopathic

## SUCCESS?

- No cures
- Non-compliant patients
- Marginal success for some patients

## ISSUES

- Patients' tinnitus may change and fluctuate over the time
- If the treatment is partially effective, it may change the perception of the frequency and/or the intensity of the patient's tinnitus for a variety of reason

# TINNITUS NEUROMODULATION TREATMENT

## TNT™

- Develop a **“modifiable” treatment program**, that would respond to changes in the patient’s tinnitus
- The use of **“intelligent” algorithms** could then be used to predict which program had the highest probability of success, based on variables that had been identified through ongoing diagnostic information

# TNT™

## PATIENT DATA

- **Demographics**
- **History**
  - Date of onset
  - Etiology
  - Medications
  - Medical conditions

## ASSESSMENTS

- **Description of Tinnitus**
  - **Types**
    - **Tonal**
      - Frequency
      - Minimum masking level
      - Residual inhibition
    - **Noise**
      - Intensity
      - Minimum masking level
      - Residual inhibition
    - **Location**
      - Left, Right, Center

# TNT™: ASSESSMENTS

- **Psyco/Social Measures**
  - Tinnitus Handicap inventory
  - Tinnitus Reaction Quotient
  - Tinnitus Severity Scale
  - Depression scale
  - Anxiety scale
- **Personality Index (Jung)**
  - Sensing-Judging
  - Sensing-Perceiving
  - Intuitive-Feelers
  - Intuitive-Thinkers

*These will be obtained using surveys*

# TNT™: ACOUSTIC TREATMENT OPTIONS

- **Tonal**
  - Non-modulated frequency
  - Frequency Modulated (40 Hz)
  - Frequency Modulated (Sweep 40-100 Hz)
  - Amplitude Modulated (+/- 5 dB)
  - Combined Modulated (AM & 40 Hz)
- **Noise**
  - Non-modulated Notched band
  - Modulated notched band (40 Hz)
  - Modulated notched band (sweep 40-100 Hz)
  - Notched band (AM +/- 5 dB)
  - Combined notched band (AM and FM 40 Hz)
  - Combined notched band (AM and sweep FM 40-100 Hz)
- **Zwicker**
  - Non-modulated  notched Zwicker band
  - Modulated notched Zwicker band (40 Hz)
  - Modulated notched Zwicker band (sweep 40-100 Hz)

# TNT™: ACOUSTIC TREATMENT OPTIONS

- **Music**
  - Non-modulated Notched band
  - Modulated notched band (40 Hz)
  - Modulated notched band (sweep 40-100 Hz)
  - Notched band (AM +/- 5 dB)
  - Combined notched band (AM and 40 Hz)
  - Combined notched band (AM and sweep 40-100 Hz)
- **Fractal**
  - Non-modulated Notched band
  - Modulated notched band (40 Hz)
  - Modulated notched band (sweep 40-100 Hz)
  - Notched band (AM +/- 5 dB)
  - Combined notched band (AM and FM 40 Hz)
  - Combined notched band (AM and sweep FM 40-100 Hz)

# TNT™: PROCEDURES

## PATIENT REGISTRATION

- Name
- Date of birth
- Sex
- Unique I.D.
- Login (email address)
- Password

## DATA

- **Data logging**
  - Login/logout date, time and duration treatment sessions
  - Treatment assigned
- **Data collection**
- **Analyses**

# TNT™: PROCEDURES PHASE I

- **Match tone frequency**
  - generate a narrowband of +/- 10% of matched tone
- **Match narrowband noise**
  - Modulate frequency of tonal band 40 Hz
  - Sweep from 40 Hz to 100 Hz back and forth over a 5 sec. window
- **Modulate amplitude**
  - +/- 5 dB
- **Zwicker - Filter out notched frequency**
  - (+/- 10% of matched tone)
  - Noise narrowband

## SELECTED TREATMENTS

- Amplitude modulation +/- 5 dB of threshold
- Frequency modulation
  - 40 Hz – 100 Hz
  - 40 Hz
- Zwicker

# TNT™: PROCEDURES PHASE II

## CLINICAL TRIALS

- Determine N subjects based on number of variables
- Contact potential sites
- Recruit subjects through:
  - Social Media
  - Tinnitus groups
  - Website
- **Develop**
  - data collection procedures
- **Integrate**
  - Data
  - Statistical recommendations
- **Select**
  - Program selection

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*Where Ideas Become Reality*

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