

The Principles of Physical Therapy and Neurologic Music Therapy (NMT)

Presented by:

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Presentation's key points:

*Presentation references at the end of document

General take-home points:

- Auditory rhythm primes the motor system to be ready to move
- Auditory feedback helps to prime muscles, and time movement
- Music can enhance fundamental steps of motor-learning
- Rhythm organizes muscle movement, optimizing muscle use
- NMT utilizes music, rhythm and instruments for carryover into non-music goals

Rhythmic Auditory Stimulation (RAS):

- Who is appropriate?
 - Anyone who has an abnormal gait pattern due to a change in motor or sensory function. (See comprehensive list under....)
- Implementation:
 1. Assess current gait parameters
 2. Administer stimulus
 3. Modulate if necessary (5-10%)
 4. Advance gait exercises*
 5. Fade auditory stimulus
 6. Reassess
- Considerations:
 - Protocol might change depending on the population
 - Should be discontinued if the patient is no longer improving with RAS intervention or if patient has a negative behavioral response to auditory stimulation

- Contraindications:
 - Inability to hear auditory stimulus
- Precautions:
 - Emotional response to music
 - Overstimulation

Tips for PT and NMT co-treatment for RAS:

- **How do you set up a co-treatment or referral?**
 - Go to <https://nmtacademy.co/findannmt/> to find clinicians in your area
 - Email MedRhythms at hello@medrhythmstherapy.com
- **How do you discuss goals and measure progress?**
 - Identify cognitive deficits, and gait mechanics you hope to address with NMT
 - Discussion regarding how current gait pattern, assistive device, and speed compared to those desired
- **What should you document?**
 - Qualitative description of improvements/changes noted during session
 - Beats per minute of rhythmic stimulus provided and changes over session

Goal domains for NTM:

Sensorimotor	Cognition	Speech & Language
<ul style="list-style-type: none"> ● Motor control, planning, and initiation ● Fine/Gross motor coordination ● Strength ● Endurance ● Balance ● Walking speed ● Walking distance ● Stride length ● Cadence 	<ul style="list-style-type: none"> ● Attention ● Memory (STM/LTM) ● Executive functions ● Sequencing ● Problem-Solving ● Arousal ● Orientation ● Command Following ● Neglect ● Visual neglect/inattention 	<ul style="list-style-type: none"> ● Expressive language ● Comprehension ● Motor control ● Muscular coordination ● Respiratory capacity ● Speech fluency ● Vocalization ● Sequencing of speech ● Intelligibility and articulation ● Speech rate



Populations served:

- Brain Injury: stroke, TBI, brain tumor, brain infections, etc.
- Neurodegenerative diseases: Parkinson's Disease, Multiple Sclerosis, Huntington's disease, etc.
- Spinal Cord Injury
- Developmental populations: Cerebral Palsy, ASD, etc.
- Aging Population
- Functional Neurologic Disorder
- Neuro-based voice disorders
- Speech fluency disorders

Additional MedRhythms' resources:

Contact information

- Email: hello@medrhythmstherapy.com
- Phone: 781-629-9713
- Website: www.medrhythmstherapy.com

Youtube channel:

www.youtube.com/c/Medrhythmstherapy/videos

- Video casts of conversations with Brian Harris, Medrhythms' CEO and Co-founder, and different members of our Scientific Advisory Board and Patient Advisory Board
- Client/Patient videos

Professional supervision

- Supervision or one-time consultation opportunities are [available](#) for professionals who are seeking additional knowledge and support on clinical, professional, and other areas of growth

Reading recommendations:

Research Articles:

- The [Academy of Neurologic Music Therapy](#) is an excellent source for finding more research articles directly related to NMT. Their two research sections are [What's new?](#) with the most recent articles, and [Supporting Research By Technique](#) is a general compilation of articles related to NMT application or music and neuroscience. Both sections are categorized by each technique. For your reference, RAS, TIMP, and PSE are the abbreviations for the sensorimotor technique

Books

- [*The Oxford Handbook of Music and the Brain*](#) by Michael Thaut
- [*Rhythm, Music, and the Brain: Scientific Foundations and Clinical Applications*](#) by Michael Thaut
- [*Why We Love Music: From Mozart to Metallica*](#) by John Powell
- [*This Is Your Brain on Music: The Science of a Human Obsession*](#) by Daniel J. Levitin
- [*Musicophilia: Tales of Music and the Brain*](#) by Oliver Sacks

Blog article

- [*Music-based interventions for the Outpatient Neuro PT*](#) by Michael Hunt

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