CRITERION INCORPORATED

NMES Treatment Protocols

The primary aim of NMES is to provide muscle rehabilitation post injury, surgery or disease by exciting targeted motor nerves and thereby producing muscle contractions. The presence of intact peripheral nerve excitability and healthy muscle tissue are necessary to induce therapeutic and functional motor responses.

The following is meant to serve as guidelines. Adjustments and parameters are to ultimately be decided by the treating physician or therapist.

NMES Parameters

1. *Waveform*

    - Symmetrical: Incorporate for larger muscle groups (e.g., quadriceps)
    - Asymmetrical: Incorporate for smaller muscle groups (e.g., fingers); negative electrode is more active in this wave form – place directly over motor point.

2. *Frequency*: Affects the quality of contraction

    - Tetany Range: 25 – 50 Hz
    - Twitch/Muscle Fatigue Range: 80+ Hz

3. *Pulse Width/Duration*: Affects patient comfort

    - Durations between 200 – 400 microsec are advisable

4. *Ramp*: Affects patient comfort, can mimic normal muscle recruitment

    - Ramp up/down: 0 – 10 seconds (see following page for appropriate times)

5. *Duty Cycle*: On/Off stimulation affects muscle fatigue rate

    - Times: 0 – 99 (see following page for appropriate times)

6. *Amplitude*: (Intensity) affects the muscular response - higher intensity = increase excitability

    - General Rule: Strong but not painful

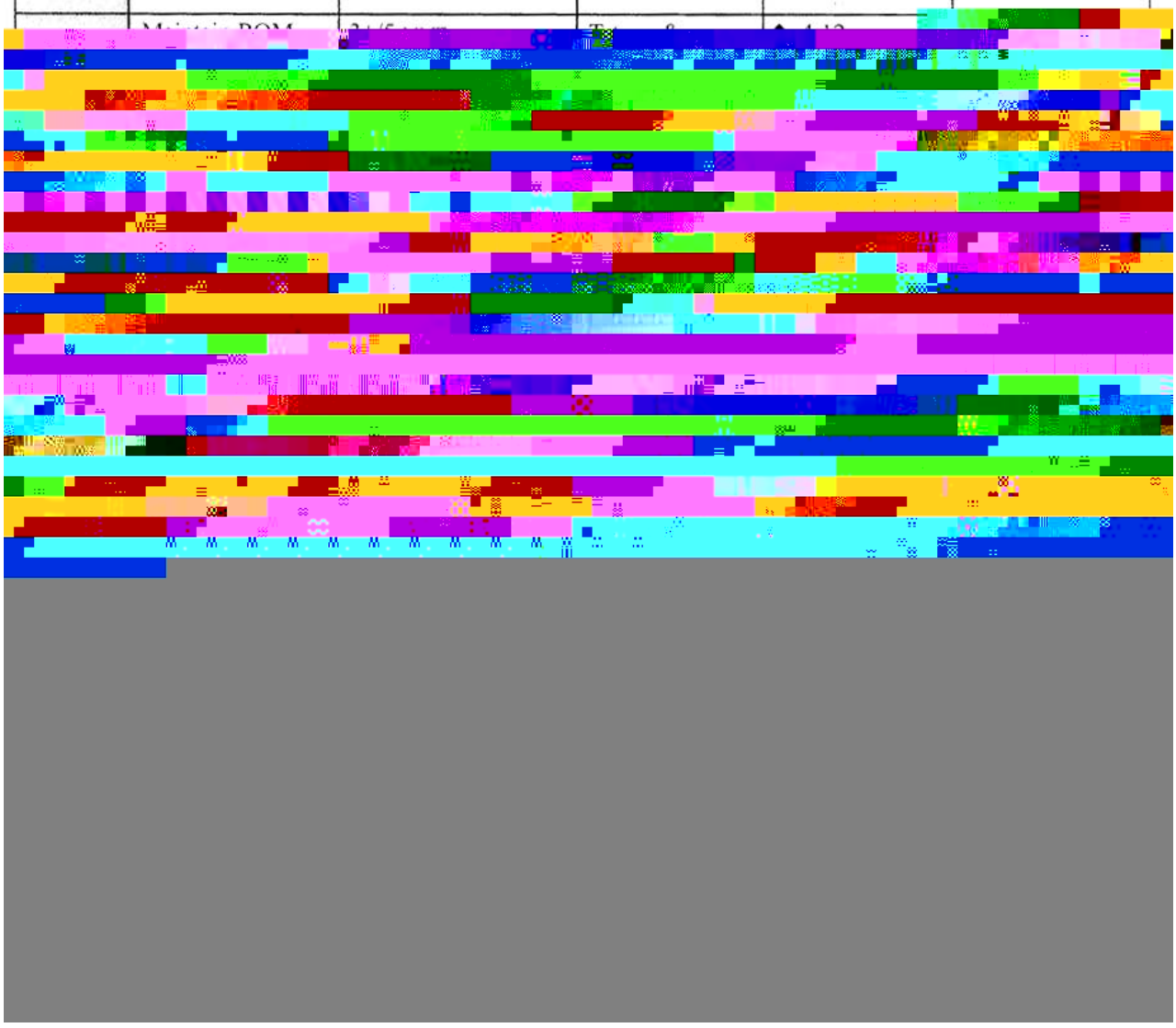
7. *Stimulation Modes*:

    - Continuous
    - Cycled: Both Channels will execute simultaneously as specified by the Duty Cycle
    - Reciprocate: Channels will alternate stimulation

NMES Recommended Treatment Programs

**highlighted parameters are a critical element, to ensure successful outcomes

	Treatment Program	Quality of Contractions	Frequency	◆ ON:OFF times • Ramps	Treatment Duration
Muscle Conditioning	Strength Training	**60% + MVIC**	Comfort	◆ 10:50 • Comfort	• 10-15 reps • 3-5 days/wk • 2-3 weeks
	Endurance Training	Max Contraction up to 3+/5 MMT	Tetany	◆ 4:12 • Comfort	• **30-60 min stimulation ON time** • Daily • 2+ weeks



Information above is based on the work by Los Amigos Research & Education Institute. It is an extract from the book **Neuro Muscular Electrical Stimulation, A Practical Guide, 4th Edition.**