

NMES Guidelines for Treatment

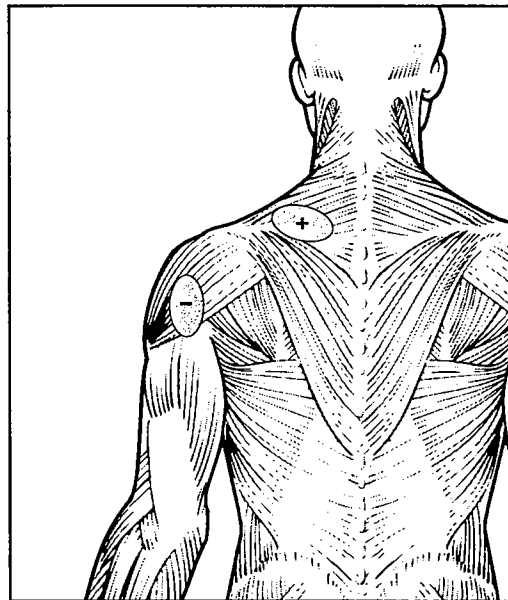
Neurologic Shoulder Subluxation

Glenohumeral subluxation commonly occurs following a central nervous system insult. Up to 90% of patients present with a flaccid upper extremity immediately after a stroke.¹ Loss of central motor control over the rotator cuff muscle group causes decreased support of the humeral head and alters its normal resting position. Decreased support of the humeral head can also lead to stretching of the shoulder capsule. If this occurs, chronic subluxation may persist, even after the patient regains voluntary control of the involved muscles.²

These changes can lead to a series of complications such as difficulty with functional use of the upper extremity, shoulder pain and autonomic dysfunction of the upper extremity. Instances of forceful or prolonged separation may also result in damage to the brachial plexus.^{1,2} To avert or minimize these complications, a goal of acute rehabilitation should be to avoid stretching the shoulder capsule.²

Neuromuscular Electrical Stimulation (NMES) can prevent and retard disuse atrophy and assist in muscle re-education. Thus it can be used in the early stroke rehabilitation program as an orthotic assist. NMES induced contractions of the shoulder muscles can pull the head of the humerus into the glenoid fossa to reduce subluxation.¹ Early protection of the shoulder capsule via NMES may result in faster recovery of upper extremity function for patients who have suffered a stroke.¹

Treatment decisions should be based on a full patient evaluation and individualized for each patient. Consult your device manual for specific instructions for use, indications, contraindications, precautions and warnings.



For complete parameters see reverse side.

Single Channel Set-Up

This application provides stimulation to specific shoulder muscles to reduce subluxation of the humeral head.

Electrode Placement:

- Negative electrode (-) should be placed posteriorly on the proximal third of the upper arm over the posterior deltoid.
- Positive electrode (+) should be placed above the spine of the scapula in the supraspinous fossa. The placement of this electrode is critical to prevent activation of the upper trapezius muscle.

Parameters:

- Rate: 25-35pps
- Waveform: Asymmetrical
- On:Off Ratio: 1:3 start, progress to 12:1.
See reverse side for full parameters.

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Parameter Guidelines for NMES / Neurological Shoulder Subluxation

Electrode Type Placement	Rate	Ramp	On:Off Cycle (1,3)	Waveform	Program Intensity	Treatment Duration	Clinical Rationale
<p>Single Channel set-up</p> <p>Place negative (-) electrode over the posterior deltoid.</p> <p>Place positive (+) electrode above the spine of the scapula, over the supraspinatus muscle. (Avoid placement over the upper trapezius muscle.)</p> <p>Select the largest possible electrode that minimizes overflow to other muscles and conforms to the treatment area.</p>	25-35 pps	Use patient comfort as a guide (1-3 secs).	<p>Specialty Endurance Program:</p> <p>Start with a 1:3 ratio. Goal is to achieve a 6-8 hour treatment session without marked fatigue. Muscular fatigue should be measured by palpating the amount of subluxation present at the end of the stimulation session. Increase on time by 2 seconds daily or every other day until 24-30 seconds is achieved.</p> <p>Once maximum on time is achieved, decrease off time in 2-second intervals in similar fashion. Goal is to achieve a 12:1 or 15:1 ratio. (ie. 24:2 or 30:2)</p>	Asymmetrical Biphasic	<p>Fair plus (tetanized) muscle contraction so reduction of the glenohumeral joint occurs. This can be palpated or measured by x-ray. Fatigue should be monitored during treatment sessions to ensure reduction is maintained.</p>	<p>Evaluate NMES application in the clinic and progress to a home program as quickly as possible.</p> <p>Begin with three, 30 minute sessions daily. Goal is to work up to a 6-8 hour treatment session per day. Stimulation program may continue until the patient regains independent functional control of the shoulder musculature.</p>	<p>Re-education of the glenohumeral joint allows repositioning of the humeral head in an anatomically correct manner.</p> <p>Improved joint alignment can provide a stable base for improved functional use of the involved upper extremity.</p>
<p>Dual Channel set-up</p>							

Dual Channel set-up Integrates NMES for the re-education of the scapular stabilizing muscles to the shoulder subluxation program once the patient has progressed to work on functional upper extremity activities. Refer to our Orthopedic Shoulder rehabilitation guidelines.

References

1. Faghri PD, Rodgers MM, Glaser RM, Bors JG, Ho C, Akuthota P: The Effects of Functional electrical stimulation on Shoulder Subluxation, Arm Function Recovery, and Shoulder Pain in Hemiplegic Stroke Patients. Arch Phys Med Rehabil 1994; 75:73-9.
2. Baker L, Parker K: Neuromuscular Electrical Stimulation of the Muscles Surrounding the Shoulder. Physical Therapy 66 (12): 1930-37, 1986
3. Baker L, McNeal D, et al: Functional Electrical Stimulation - A Practical Guide, Rancho Los Amigos Rehab Engineering Center, Third Edition, 1993.

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