Ng Teng Fong General Hospital

Guide to electrical stimulation for patients and caregivers

Purpose of electrical stimulation

It is the use of an electrical current to a nerve to stimulate a muscle contraction - often on weak muscles post-stroke/brain injury. It is a complementary rehabilitation treatment and should be combined with active training of mobility, strength, coordination and functional training.

Main Settings

	Muscle strengthening mode
Frequency (Hz)	35-50
Pulse duration (μs)	200-300
Ramp up time (s)	1
Ramp down time (s)	1
On time (s)	15
Off time (s)	45
Mode	Synchronous/Constant/Alternating Kindly check with your occupational therapist
Time	Approximately 30 minutes (2 - 3 times a day) Kindly check with your occupational therapist

Settings will be pre-set during the occupational therapy session either during your stay in the hospital or when you come back for outpatient therapy. Please check with your occupational therapist before use.

Key considerations

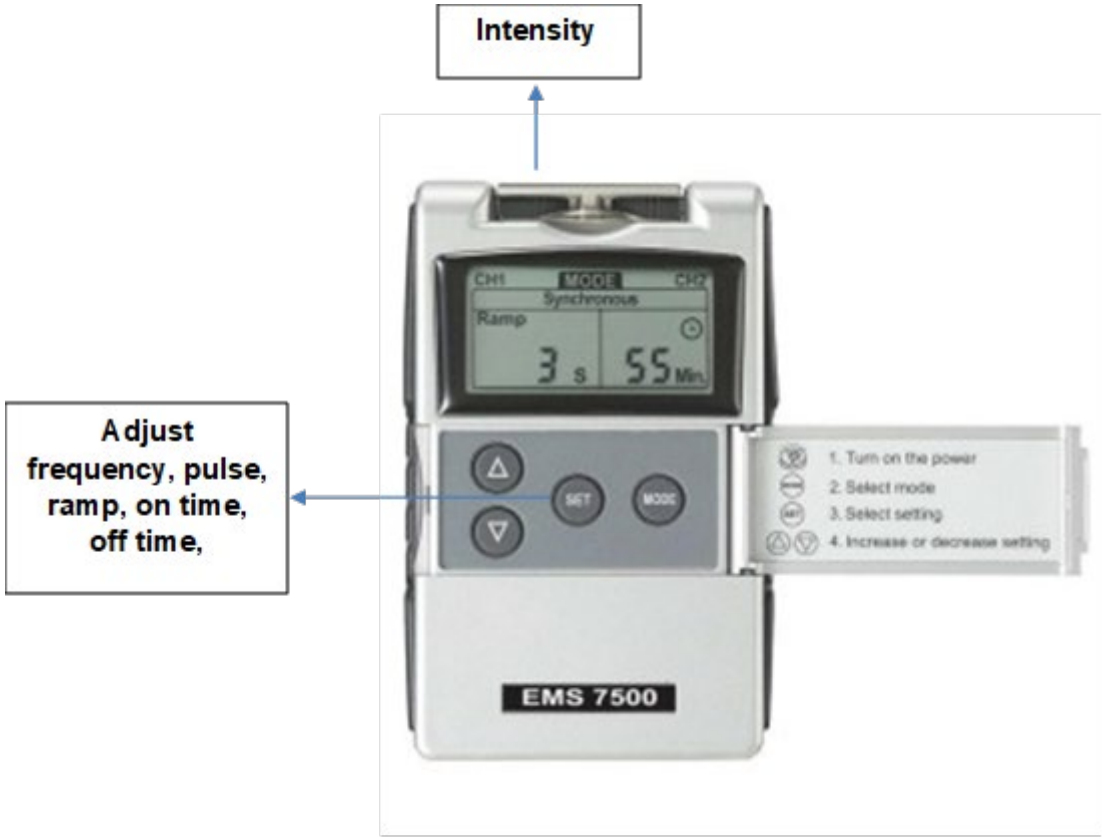
- Muscle fatigue is common and expected after the use of electrical stimulation. Signs include tremors and reduced strength of muscle contraction. If you experience such symptoms, reduce the duration of electrical stimulation. Inform your occupational therapist during your next visit so that the settings can be reviewed and adjusted.
- It is normal to experience a little reddening after the stimulation, and it should fade within the next few minutes. If the redness persists, check the intensity setting and size of electrode. You may consider changing the electrodes.
- Avoid handling the electrodes while the machine is turned on, to prevent the stimulation from affecting other areas of your body.
- Remember to turn off the machine before you remove the electrodes.

Other precautions

- For patients with spinal cord injury above T6, please monitor your blood pressure and look out for episodes of autonomic dysreflexia (sudden onset of excessively high blood pressure).
- Please consult your doctor or occupational therapist if you have: (i) a recent seizure/ epileptic episode, (ii) cancer or history of cancer in remission, (iii) recent insertion of pacemaker
- Avoid use over or near the uterus during pregnancy.
- Do not use if you have a cardiac pacemaker.
- Do not place electrodes over dermatological lesions e.g. eczema/ open wounds
- Do not use when you are driving or operating dangerous machinery/ equipment.
- If you experience intense pain while using the electrical stimulation, stop using it and make an appointment to see your occupational therapist.

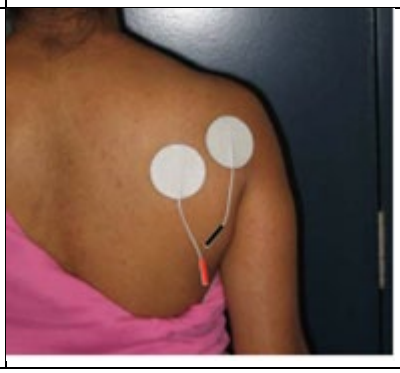
Steps to using electrical stimulation

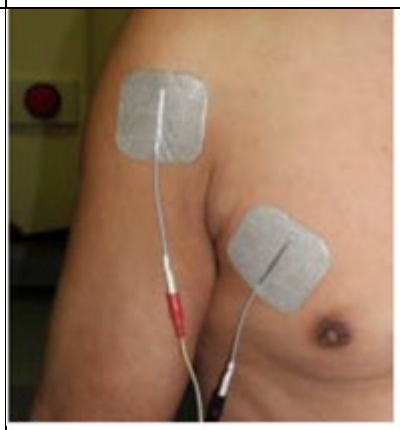
1. Ensure skin is dry and clean, before placing electrodes on the muscle groups as instructed by your occupational therapist.
2. Turn on the machine and adjust the parameters as specified.
3. You should feel a buzzing sensation.
4. Gradually increase the intensity to the highest point that you can tolerate without feeling painful.
5. Observe for fatigue during the session and adjust intensity accordingly.
6. After the session ended, turn off the machine before removing the electrodes. Check for skin condition beneath the electrodes.

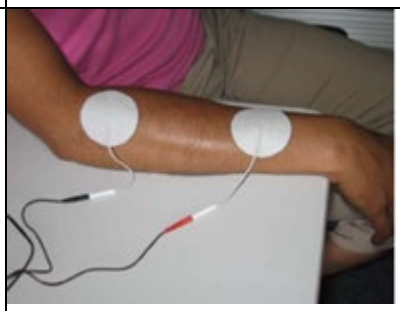


How to care for electrode pads

1. To prolong the lifespan of the electrode pads, wipe them gently with a damp cloth after each use.
2. Keep the electrode pads in their adhesive liners after each use to prevent them from drying out.

Purpose	Muscle and placement	Position
Prevent shoulder subluxation (muscles that contract to prevent shoulder joint from loosening)		Starting position: • Sit with arm opened towards the side and supported by a table Electrode positions: • above shoulder blade (supraspinatus) • upper middle portion of shoulder (middle deltoid)
Shoulder stabilisation (muscles that stabilise the shoulder joint)		Starting position: • Sit upright with arm supported by table in front Electrode positions: • lower trapezius • rhomboids
Shoulder external rotation (muscles that allow shoulder joint to open up and reach sideways)		Starting position: • Sit upright Electrode positions: • infraspinatus belly • infraspinatus - slightly more medial and inferior

Purpose	Muscle and placement	Position
Shoulder forward flexion: (enables shoulder to lift up)		Starting position: • Sit upright with arm supported by table Electrode positions: • chest (pectoralis major) • front of shoulder (anterior deltoid)
Elbow extension (muscles that allow our elbow to straighten)		Starting position: • Sit upright with arm unsupported by side of body Electrode positions: • upper portion of triceps • middle portion of triceps
Forearm supination (muscles that rotate the forearm)		Starting position: • Sit upright with arm supported by table Electrode positions: • back upper portion of forearm • above elbow crease, lower portion of biceps

Purpose	Muscle and placement	Position
Wrist extension (muscles that move the hand backwards at the wrist)		Starting position: • Sit upright with arm supported by table Electrode positions: • upper third portion of forearm • above wrist crease, with palm down
Finger extension (muscles that straighten the fingers)		Starting position: • Sit upright with arm supported by table Electrode positions: • upper third portion of forearm • above wrist crease, with palm down
Wrist flexion (muscles that bend the hand down at the wrist)		Starting position: • Sit upright with arm supported by table, wrist supported on towel if necessary Electrode positions: • upper third portion of forearm • middle of forearm

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This patient information leaflet was created by Occupational Therapy from Ng Teng Fong General Hospital.

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