Recommendations for the optimal use of the Electromyography (EMG) sensor

Tips & Tricks

- Ensure that the entire electrode surface makes an **optimal contact to the skin** and that the **electrodes do not touch each other.**
- Ensure that the **NMT measurement is stopped before connecting/disconnecting the sensor clips.**
- Only use **GE NMT electrodes** (57268-HEL) which **provide wider conducting surface than standard ECG electrodes** ensuring better measurement and improved signal output.
- **NMT Electrodes** (57268-HEL) **are for single use only**, do not reuse them as it could pose a risk for infection and/or result in measurement errors.
- Make sure **the NMT lead wires are not on tension and do not pull on the electrodes.**
- **Use only supplies and accessories approved by GE** for proper and accurate function of the measurement.
- **EMG measurement is recommended for robotic surgery** due to the tight fixation of the arm toward the body of the patient. Compared to other measurements, EMG allows measurement even with impaired movement of the hand.

EMG sensor positioning optimization

1. Skin preparation

• Remove possible body hairs from the electrode application area.

• Wipe the skin with alcohol and let dry.

• Do not place electrodes on areas with excessive body hair or lesions.

2. Stimulation electrodes: BROWN AND **WHITE** lead connection *(Figure 1).*

Hand: Place the two electrodes **along the ulnar nerve**.

Foot: Place the two electrodes **along the tibial nerve**.

Keep brown electrode distal and the white one proximal, do not swap them to avoid reducing supramaximal current.

3. Reference sensor electrode: BLACK lead connection.

Place the sensor preferably between the stimulating and measuring lead connection electrodes *(Figure 2).*

4. Measuring electrodes: RED AND **GREEN** lead connection.

Hand: Place the two electrodes at the **abductor pollicis muscle or the hypothenar muscle** *(Figure 3).*

Foot: Place the two electrodes at the **flexor hallucis brevis muscle** *(Figure 4).*

Figure 1

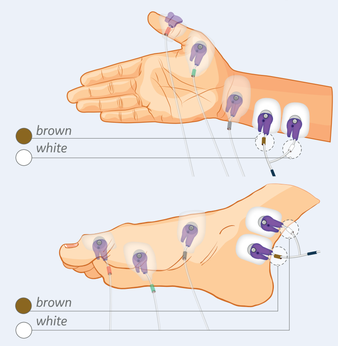


Figure 2

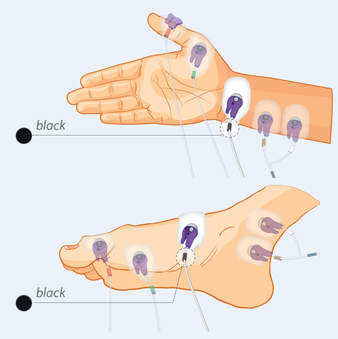


Figure 3

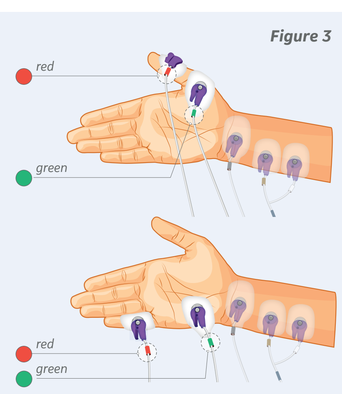
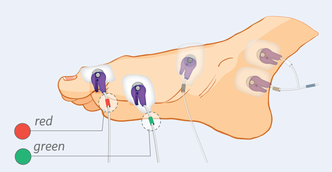


Figure 4



GE Healthcare ElectroSensor

Electromyography is the ideal quantitative Method to reduce the risk of residual paralysis[1]

Features

- Quantitative measured response indicates level of neuromuscular block
- Automatic cycling, with a user-defined interval
- Stimulation modes available: train-of-four (TOF), Post-tetanic count PTC, Double-burst stimulation (DBS), Single Twitch (ST)
- Regional block adapter for nerve stimulation in regional anaesthesia

Benefits

- Reduction in **recovery room length of stay** by up to 80 mins[2]
- Optimized and lower dosage of **neuromuscular blocking agents**[3]
- Optimized dose of **reversal agent** administration such as sugammadex[4]
- Reduction in postoperative **unwanted events** (acute respiratory events, muscle weakness, longer PACU stays, delays in extubation, increased risk of postoperative pulmonary complications)[5]
- Electromyography **accuracy** vs other technologies - TOF ratio of 90% may not be adequate for extubation with all technologies[6]

[1] NAGUIB/hunter A&A 2018, Consensus Statement on Perioperative Use of Neuromuscular Monitoring. [2] Butterly, Bittner, George et al., Br J Anaesth 2010; 105: 304. [3] Monitoring and Pharmacologic Reversal of a nondepolarizing NM blockade should be routine. Ronald Miller MD, Theresa Ward BSN, RN . Anestehsia-Analgesia July 2010 Volume 111 Number 1. [4] Kaufhold N., et al. Sugammadex and neostigmine dose-finding study for reversal of residual neuromuscular block at a train-of-four ratio of 0.2 (SUNDRO20). British Journal of Anaesthesia, 116(2), 233-240 (2016). [5] Murphy G.S. and Brull S.J., Residual neuromuscular block: lessons unlearned. Part I: definitions, incidence, and adverse physiologic effects of residual neuromuscular block. Anesthesia & Analgesia, 111(1), 120-128, (2010). [6] Salminen J., et al. Comparison of train-of-four ratios measured with Datex-Ohmeda's M-NMT MechanoSensor™ and M-NMT ElectroSensor™. Journal of Clinical Monitoring and Computing, 30(3), 295-300 (2016).

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