

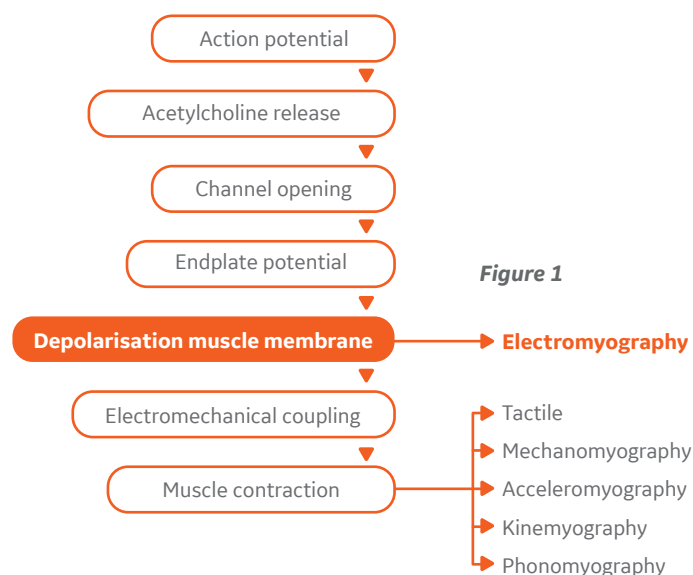


# Recommendations for the optimal use of the Electromyography (EMG) sensor

## Background information

Electromyography (EMG) is the process of recording the electrical muscular fiber activity in response to the nerve stimulation. EMG captures the electric signal at an early stage during the depolarization of the muscular membrane - the first signal for measuring the effect of the NMBA. All other technologies, such as AMG and KMG amongst others, measure the signal at a later stage during the contraction of the muscle membrane (*Figure 1*), which increases interference and noise in the final measurement. Adequate recovery from neuromuscular block, indicated by TOF > 90%, can be reliably determined only with quantitative monitoring. EMG TOF ratio is the gold standard for detecting neuromuscular block in clinical setting and is not interchangeable with e.g. AMG TOF<sup>1,2</sup> that may overestimate the recovery by at least 0.151. Therefore, residual neuromuscular block, defined as an EMG TOF ratio of < 0.90, cannot be excluded immediately on reaching an AMG TOF ratio of 0.90 or even 1.00.

Studies have shown that the implementation of quantitative EMG neuromuscular transmission monitoring resulted in a significant reduction in the incidence of incompletely reversed patients in the PACU<sup>3</sup>.



## 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 Healthcare 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 2).

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 3).

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

Hand: Place the two electrodes at the **abductor pollicis muscle or the hypothenar muscle** (Figure 4).

Foot: Place the two electrodes at the **flexor hallucis brevis muscle** (Figure 5).

<sup>1</sup>An ipsilateral comparison of acceleromyography and electromyography during recovery from nondepolarizing neuromuscular block under general anaesthesia in humans. Liang et al. *Anesth Analgesia* 2013 Aug; 117(2):373-9.

<sup>2</sup>Consensus Statement on Perioperative Use of Neuromuscular Monitoring. Naguib M et al. *Anesth Analgesia* 2018 Jul;127(1):71-80.

<sup>3</sup>The implementation of quantitative electromyographic neuromuscular monitoring in an academic anaesthesia department. Todd et al. *Anesth Analg*. 2014 Aug; 119(2):323-31

## Imagination at work

Product may not be available in all countries and regions. Full product technical specification is available upon request. Contact a GE Healthcare Representative for more information. Please visit [www.gehealthcare.com/promotional-locations](http://www.gehealthcare.com/promotional-locations).

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