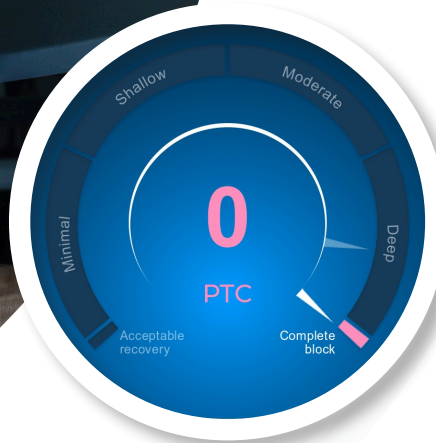




Precision Monitoring during Robotic-Assisted Surgeries with TetraGraph® System Guides Optimal Clinical Management”

(Hernandez et al, 2021)

Robotic-assisted surgeries (RAS) demand unparalleled precision and immobility.



THE QUANTITATIVE Train-of-Four Monitor

Designed for Robotic-Assisted
(RAS) Surgery

Why the TetraGraph system is the preferred monitor for robotic surgeries

The TetraGraph system offers anesthesiologists the gold standard in EMG-based quantitative train-of-four (TOF) monitoring, ensuring profound and/or complete muscle relaxation and optimal conditions for robotic procedures.



1

Enhanced Immobility for Robotic Precision

Here's why a quantitative train-of-four monitor is your ideal partner in the operating room:

Eliminate Patient Movement: The TetraGraph system ensures complete neuromuscular block, preventing any involuntary patient movement during surgery, while preventing neuromuscular blocking agent (NMBA) overdosing. This is critical for the immobility required in robotic-assisted surgeries.

Robotic Precision and Surgeon Control:

Robotic systems rely on precise, controlled movements. Even small involuntary patient movements can interfere with the alignment of robotic instruments and compromise the accuracy and safety of the procedure.

Clinical Data:

Over 80% of robotic surgeries rely on NMBAs to maintain optimal conditions (**Internal Data Analysis on File**). Quantitative monitoring significantly reduces intraoperative complications compared to visual or tactile assessment methods (**Weigel et al., 2022**).

2

Optimal Recovery and Patient Outcomes

Reduced Postoperative Residual Neuromuscular Block:

Without TOF monitoring, residual block incidence is between 33% (**Carvalho et al., 2020**) and 65% (**Fortier LP et al., 2015**). Using quantitative monitoring, anesthesiologists can guarantee a TOFR >0.90 prior to tracheal extubation, reducing pulmonary complications by 43% (**Weigel et al., 2022**).

Shorter Hospital Stays:

Patients quantitatively monitored experience a 1-day reduction in hospital length of stay, optimizing recovery and lowering healthcare costs (**Weigel et al., 2022**).

Trusted by Experts:

Used in thousands of operating rooms running robotic surgeries, backed by clinical evidence and aligned with guidelines.

Validated at deep Levels of Block:

The only portable and dedicated EMG-monitor that is clinically validated at all levels of block, including deep block.

Industry Leading Precision:

Proven in studies to provide industry-leading accuracy and integrates into any robotic surgery workflow.

3

Cost-Effective Anesthesia Management

Precision Dosing:

Quantitative monitoring enables accurate dosing of reversal agents like sugammadex. In a recent study, 87% of patients required less sugammadex than the recommended dose, and 13% required more (Bowdle et al., 2023).

Increased Efficiency:

Quantitative monitoring shortens PACU discharge times, optimizing turnover and resource allocation (Iwasaki H., 2020; Haberkorn S, 2024).

4

Improved Clinical Outcomes

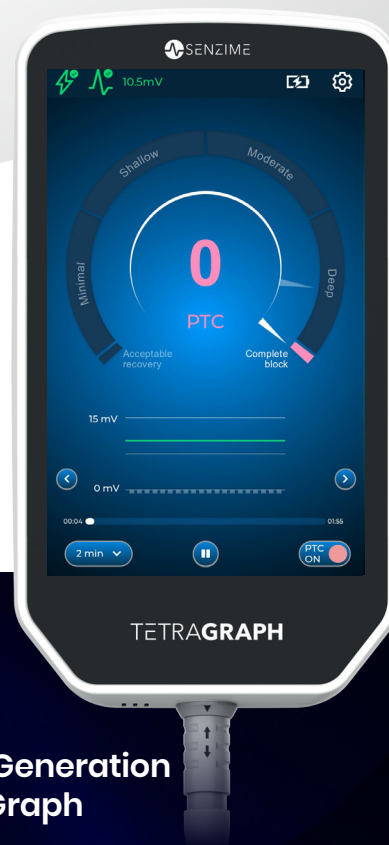
Pulmonary Complications:

Achieving TOFR >0.90 reduces complications, including pneumonia and reintubation (Weigel et al., 2022).

Patient Safety:

Quantitative monitoring eliminates residual block in 100% of cases, compared to a 16% incidence without monitoring when using sugammadex (Domenech et al, 2019) (Kotake, 2013). Even when the recommended dose of sugammadex is administered under qualitative (subjective) assessment, residual neuromuscular block in the recovery room occurs frequently, indicating that quantitative monitoring is necessary for best patient outcome (Koo CH, 2024).

TETRAGRAPH



Next-Generation TetraGraph

Your Portable EMG Monitor for Accurate Measurements

✓ **Higher precision than acceleromyography (AMG)** as TetraGraph measures the compound muscle action potential (CMAP).

✓ **Independent of hand or thumb movement.** Unlike traditional monitoring techniques like acceleromyography (AMG), TetraGraph EMG can function without requiring unimpeded thumb movement during surgery, enabling flexibility in arm positioning, such as tucking arms under surgical drapes.

✓ **Superior algorithm validated for accuracy** against MMG (mechanomyography) at all levels of block, with integrated noise-canceling technology ensuring precise measurements without the need for extra electrodes.

TETRAGRAPH



References:

1. Hernandez V, Chavez-Cardona H, Renew JR, Brull SJ. Electromyographic And Acceleromyographic Monitoring In Restricted Arm Movement Surgical Setting. A Prospective, Randomized Trial. *Anesthesiology* 2021;A2069.
2. Weigel WA, Williams BL, Hanson NA, et al. "Quantitative Neuromuscular Monitoring in Clinical Practice: A Professional Practice Change Initiative." *Anesthesiology*, 2022; 136(6):901-915. DOI: 10.1097/ALN.0000000000004174.
3. Carvalho H, et al.: Forty years of neuromuscular monitoring and postoperative residual curarisation: a meta-analysis and evaluation of confidence in network meta-analysis. *Br J Anaesth*. 2020 Oct;125(4):466-482.
4. Fortier LP, McKeen D, Turner K, et al. The RECITE study: a Canadian prospective, multicenter study of the incidence and severity of residual neuromuscular blockade. *Anesth Analg* 2015; 121: 366e72
5. Iwasaki H, Kurosawa A, Iida T, Sasakawa T, Kanda H. The use of intraoperative neuromuscular monitor reduces the reversal dose of sugammadex: a single-center retrospective study. *J Anesth* 2020; 34:276-280.
6. Haberkorn S, Twite M, Klockau K, Whitney G, Faulk DJ. Quantitative monitoring maximizes cost-saving strategies when antagonizing neuromuscular block with sugammadex. *Cureus* 2024; 16(9):e68551.
7. Bowdle TA, Haththotuwegama KJ, Jelacic S, Nguyen ST, Togashi K, Michaelsen KE. A Dose-finding Study of Sugammadex for Reversal of Rocuronium in Cardiac Surgery Patients and Postoperative Monitoring for Recurrent Paralysis. *Anesthesiology*. 2023 Jul 1;139(1): 6-15. doi:10.1097/ALN.0000000000004578. PMID: 37027807.
8. Koo CH, Lee S, Yim S, Bae YK, Park I, Oh AY. Is quantitative neuromuscular monitoring mandatory after administration of the recommended dose of sugammadex? A prospective observational study. *Anaesth Crit Care Pain Med* 2024; 43:101445.
9. Domenech, G., Kampel, M.A., García Guzzo, M.E. et al. Usefulness of intra-operative neuromuscular blockade monitoring and reversal agents for postoperative residual neuromuscular blockade: a retrospective observational study. *BMC Anesthesiol* 19, 2019.
10. Kotake, Y. Reversal with sugammadex in the absence of monitoring did not preclude residual neuromuscular block. *Anesth. Analg*, 2013.

Learn more

Discover how the TetraGraph system can revolutionize robotic-assisted surgeries in your operating rooms.

Contact us today or visit.

[Senzime.com/Robotics](https://www.senzime.com/Robotics)



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