

CMEO Podcast Show Notes

Defining levels of neuromuscular blockade^{1,2}

Depth of blockade	Peripheral nerve stimulator and qualitative assessment	Quantitative monitor
Complete	Post-tetanic count = 0	Post-tetanic count = 0
Deep	Post-tetanic count \geq 1; train-of-four count = 0	Post-tetanic count \geq 1; train-of-four count = 0
Moderate	Train-of-four count = 1-3	Train-of-four count = 1-3
Shallow*	Train-of-four count = 4; train-of-four fade [†] <i>present</i>	Train-of-four ratio < 0.4
Minimal*	Train-of-four count = 4; train-of-four fade [†] <i>absent</i>	Train-of-four ratio = 0.4-0.9
Acceptable or adequate recovery	Unable to determine with peripheral stimulator or qualitative assessment	Train-of-four ratio \geq 0.9 (previously defined in some trials as TOF \geq 0.7)

[†]Fade indicates that the first twitch is stronger than the last twitch

*The quantitative threshold of train-of-four (TOF) ratio of 0.4 cannot reliably be subjectively determined by the presence or absence of fade. Absence of appreciated fade has been reported with a TOF ratio of less than 0.3, and presence of fade has been reported with TOF ratio of greater than 0.7.

Drug selection dependent on the depth of blockade: sugammadex and neostigmine¹

- Sugammadex is recommended over neostigmine for reversal of shallow, moderate, and deep levels of neuromuscular blockade induced by rocuronium or vecuronium
- Neostigmine can be utilized for reversal of agents not impacted by sugammadex, such as cisatracurium or atracurium, at minimal neuromuscular blockade depth
- Neostigmine is recommended as a reasonable alternative to sugammadex for antagonism of minimal block (TOF = 4 with fade absent)

Optimal location for monitor placement^{1,3}

- The definition of adequate recovery (TOF > 0.9) is based on measurements obtained at the adductor pollicis muscle
- Ideally, adductor pollicis muscle should be used for neuromuscular monitoring
- The eye muscles should not be used, as these muscles are relatively resistant to neuromuscular blockade, and studies have consistently documented earlier recovery of twitches at this site

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- If intraoperative neuromuscular monitoring has been performed at the eye muscles (because no other site was easily accessible intraoperatively), the monitoring site should be changed to the adductor pollicis muscle as soon as possible, ideally prior to administration of an antagonist

References

1. Thilen SR, Weigel WA, Todd MM, et al. 2023 American Society of Anesthesiologists Practice Guidelines for Monitoring and Antagonism of Neuromuscular Blockade: A Report by the American Society of Anesthesiologists Task Force on Neuromuscular Blockade. *Anesthesiology*. 2023;138(1):13-41.
2. Naguib M, Brull SJ, Kopman AF, et al. Consensus Statement on Perioperative Use of Neuromuscular Monitoring. *Anesth Analg*. 2018;127(1):71-80.
3. Thilen SR, Hansen BE, Ramaiah R, et al. Intraoperative neuromuscular monitoring site and residual paralysis. *Anesthesiology*. 2012;117(5):964-972.