

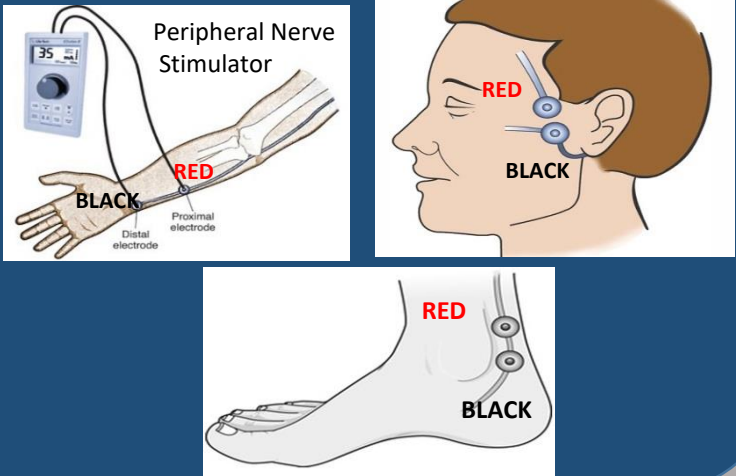
Nursing Management of Continuous Neuromuscular Blocking Agents (NMBA)

Pre-NMBA Administration

Step 1: Confirm indication for NMBA infusion and physiologic endpoints of treatment with the ICU Team.

Step 2: Ensure the patient is receiving both analgesia and sedative/amnesic continuous infusions prior to giving any NMBA. Optimize analgesia to BPS <6 and sedation to RASS -4 to -5

Step 3: Begin Peripheral Nerve Stimulation (PNS) and Train of Four (TOF) Monitoring by placing the PNS electrodes along ulnar (preferred), facial (2nd), or post tibial nerve (3rd).



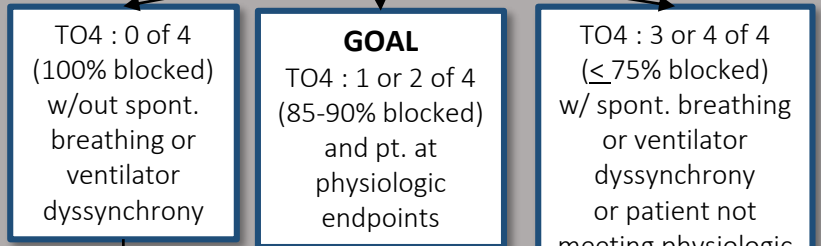
Step 4: After sedative and analgesia goals met, and before patient is paralyzed, obtain baseline supramaximal stimulus (SMS) reading

- Start the peripheral nerve stimulator (PNS) at 10mA
- Check a TOF, then gradually increase by increments of 10mA
- Recheck the TOF response until patient exhibits a 4 out of 4 response. (Typical SMS baseline is 40-60mA)

Titrating the NMBA infusion

Step 5: Administer ordered bolus dose of NMBA and then begin continuous NMBA infusion

Step 6: Recheck the TOF within 1 hour
Always return to the baseline SMS mA where patient twitched 4/4
Goal is for the patient to twitch only 1-2 X out of 4 indicating 85-90% blocking of neuromuscular receptors



No titration changes needed

Please Reference the Guideline for Use of Neuromuscular Blocking Agents in the ICU in the Penn Medicine Inpatient Formulary for titration recommendations specific to each NMBA

Step 7: Obtain TOF q 30 minutes while titrating, until patient is at goal TOF 1 or 2 out of 4 without spontaneous breathing, ventilator dyssynchrony, or per clinical goal as determined by the ICU Team.

Penn Chart

- Document the baseline mA & location at which the patient twitches 4 out of 4, and all proceeding TOF assessments.
- If patient remains at the TOF goal and clinical goal, assess TO4 at least every 4 hours while on continuous NMBA.

| Train of four | | | |
|---------------|--|--|-------------|
| Train of Four | | | 4/4 |
| SMS Site | | | left; ulnar |
| mA | | | 10 |

Frequent Clinical Questions

- 1. What happens if patient becomes hypotensive?**
Do not wean sedatives or analgesics while patient receiving NMBA, this increases the risk of patient experiencing awareness while being paralyzed. Discuss with provider, evaluate etiology and may consider fluids or vasopressor.
 - 2. What happens if patient becomes hypertensive?**
Discuss with provider, may be a sign of underlying condition, under-sedation, or pain. Consider bolus dose of sedative or analgesic, do not titrate NMBA. If bolus effective, then increase continuous infusion rate of the medication that was effective.
 - 3. Should I be using a (Bispectral Index Monitor) BIS monitor?**
BIS technology uses a forehead sensor to obtain raw EEG information to analyze a patient's hypnotic state, and display a BIS reading between 1-100. For use with NMBA, the goal is 40-60 indicating *deep sedation; pt. unresponsive to verbal stimulation, and low risk of recall.*
- BIS monitoring (or equivalent technology) is considered a unit level population based, practice decision, please refer to unit based guidelines for more information.