

## Neuromuscular Blockade

### Purpose:

1. To provide guidelines for the care and monitoring of patients requiring paralyzation with neuromuscular blocking agents.
2. To provide guidelines for the safe use of a peripheral nerve stimulator.
3. Whenever the use of vecuronium or any other neuromuscular blocking agent is contemplated in the ICU, it is recommended that neuromuscular transmission be monitored during administration and recovery with the assistance of a nerve stimulator. Additional doses of any neuromuscular blocking agent should not be given before there is a definite response to the first twitch. If no response is elicited, infusion administration should be discontinued until a response returns.
  - a. If bolus paralytic being given, nerve stimulation may not be done if bolus doses occur only for ventilator dyssynchrony and hypoxia.
4. The goal is to not have ventilator dyssynchrony or no spontaneous movements at the same time not giving more than necessary the amount of paralytic needed.

### Policy:

1. The physician shall document the type of neuromuscular blockade. Physician's orders will include the drug, IV route, and administration schedule (bolus injection, continuous infusion or PRN movement).
2. Any change in infusion rate shall be ordered by the physician. In an emergency, the RN may decrease or stop the infusion before calling the physician.
3. The physician shall order eye lubricant on a regular scheduled basis.
4. The nurse shall assess for proper eye closure. (Eyelids may need to be taped if proper eye closure not present.)
5. **ALL patients who are paralyzed will receive adequate sedation.**
6. Assessment of appropriate muscle firing shall be done.
  - a. A peripheral nerve stimulator can be used to assess muscle firing adequacy of neuromuscular blockade for patients on continuous infusions.
  - b. Visual assessment of muscle firing can be performed with patients receiving intermittent dosages of paralytics.
  - c. **The goal is to have the patient receive the least amount of paralytic for the desired response.**
7. The drug can be withheld every 24 hours so that a neurological assessment may be performed if ordered.
8. Tight Glycemic Control may be ordered to assist in the prevention of myopathy of critical illness.

**Procedure:**

<b>Responsible Party</b>	<b>Action</b>
MD	<ol style="list-style-type: none"><li>1. Determines the need for neuromuscular paralysis.</li><li>2. Assures that the patient is properly mechanically ventilated with a secure airway and ventilatory rate.</li><li>3. Order appropriate amount of sedation. It is highly recommended that orders are written for a continuous infusion of analgesic and sedation/amnesic. Both are needed for patient comfort and loss of recall.</li><li>4. Order desired neuromuscular paralytic.</li><li>5. Order the peripheral nerve stimulator as "Train of Four" with parameters if on continuous infusion.</li></ol>
RN	<ol style="list-style-type: none"><li>6. Orders sedation monitor if desired.</li><li>7. Assess the adequacy of mechanical ventilation with ventilatory rate and ensure that the airway is secure. Any patient undergoing paralysis will lose all voluntary neuromuscular function, including use of the muscles of respiration.</li><li>8. Verify order for sedation, paralysis, and eye lubricant.</li><li>9. Administer sedation. A patient who is paralyzed will remain awake and aware of being unable to move, unless properly sedated.</li><li>10. Administer bolus dose of paralyzing agent. Observe for cessation of muscular activity. Most drugs, such as Atracurium and Vecuronium are effective in 2 - 3 minutes.</li><li>11. Uses the peripheral nerve stimulator according to AACN Procedure Manual.</li><li>12. Notify MD for increased or decreased response and obtain order to change rate of infusion to produce appropriate level of neuromuscular blockade. In ICUs, the appropriate level of blockade is judged by two twitches, of decreasing strength, out of a train of four or spontaneous movement or breathing.</li><li>13. Observe for subtle changes in vital signs and notify MD if more sedation (analgesic and amnesic) is needed. Subtle increases in heart rate or blood pressure may be the only way for a patient to indicate that he is not receiving enough sedation.</li></ol>

**Resources:**

1. Deem, S. (2006). Intensive – care – unit – acquired muscle weakness. Respiratory Care 51 (9). 1042 – 1052.
2. Lenart, SB., & Garrity JA. ( 2000). Eye care for patients receiving neuromuscular blocking agents or propofol during mechanical ventilation. American Journal of Critical Care 9 (3). 188 -191.
3. Dawson D. (2005). Development of a new eye care guideline for critically ill patients. Intensive and Critical Care Nursing 21 119 – 122.
4. Wiegand, D. & Carlson, K. (2005). AACN Procedure Manual for Critical Care (5<sup>th</sup> edition).