Neuromuscular blocking

In the American Academy of Neurology Guidelines for Brain Death Determination there should be no recent administration or continued presence of neuromuscular blocking agents (this can be defined by the presence of a train of 4 twitches with maximal ulnar nerve stimulation).

Neuromuscular-blocking drugs block neuromuscular transmission at the neuromuscular junction, causing paralysis of the affected skeletal muscles. This is accomplished either by acting presynaptically via the inhibition of acetylcholine (ACh) synthesis or release or by acting postsynaptically at the acetylcholine receptors of the motor nerve end-plate. While some drugs act presynaptically (such as botulinum toxin and tetanus toxin), those of current clinical importance work postsynaptically.

In clinical use, neuromuscular block is used adjunctively to anesthesia to produce paralysis, firstly to paralyze the vocal cords, and permit intubation of the trachea, and secondly to optimize the surgical field by inhibiting spontaneous ventilation, and causing relaxation of skeletal muscles. Because the appropriate dose of neuromuscular-blocking drug may paralyze muscles required for breathing (i.e., the diaphragm), mechanical ventilation should be available to maintain adequate respiration.

Patients are still aware of pain even after full conduction block has occurred; hence, general anesthetics and/or analgesics must also be given to prevent anesthesia awareness.

The use of continuous infusion neuromuscular blocking agents remains controversial. The clinical benefit of these medications may be overshadowed by concerns of propagating intensive care unit-acquired weakness, which may prolong mechanical ventilation and impair the inability to assess neurologic function or pain. Despite these risks, the use of neuromuscular blocking agents in the intensive care unit is indicated in numerous clinical situations. Understanding pharmacologic nuances and clinical roles of these agents will aid in facilitating safe use in a variety of acute disease processes [1)].

1)
Smetana KS, Roe NA, Doepker BA, Jones GM. Review of Continuous Infusion Neuromuscular Blocking Agents in the Adult Intensive Care Unit. Crit Care Nurs Q. 2017 Oct/Dec;40(4):323-343. doi: 10.1097/CNQ.0000000000000171. PubMed PMID: 28834856.