ISSN: 2754-6667

Journal of Critical Care & Emergency Medicine

SCIENTIFIC Research and Community

Mini review

Open Access

Why we Should use the Neuromuscular Blockers in Critical Care?!

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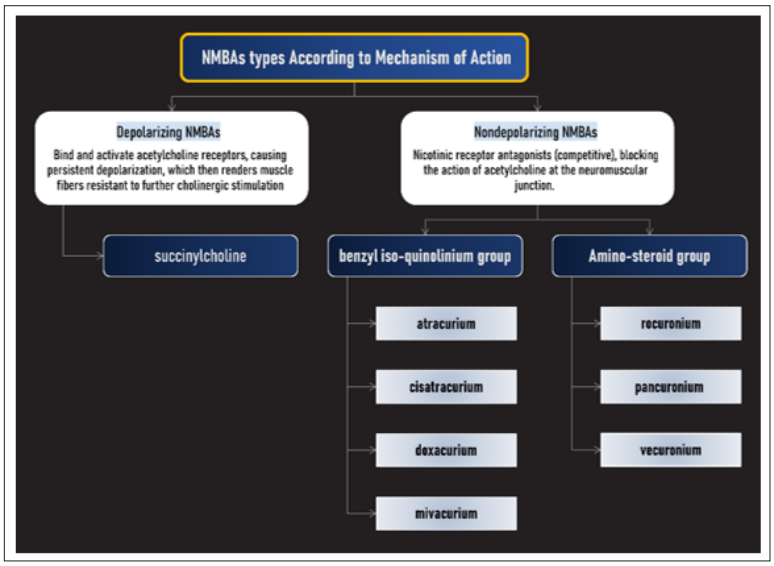
Received: February 24, 2026; **Accepted:** February 25, 2026; **Published:** March 10, 2026

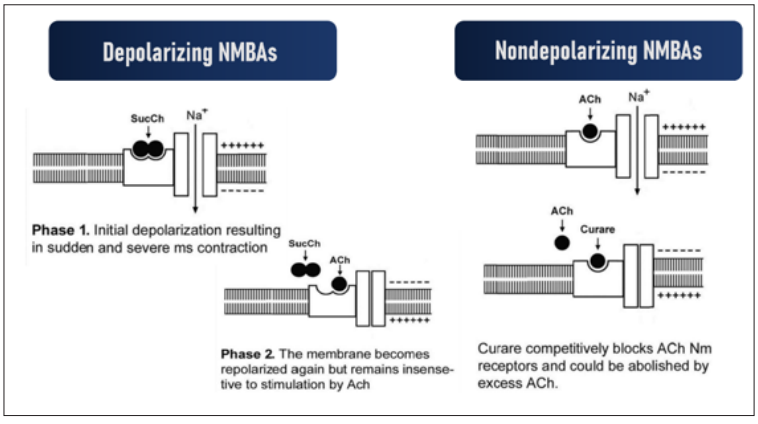
What is the Main Types of NMBAs?



When we can use the NMBAs?!

- Rapid sequence intubation
- ARDS
- Status asthmaticus
- Elevated ICP
- Elevated intra-abdominal pressure
- Targeted temperature management after cardiac arrest [1].

The Mechanism of Action (Depolarizing and Non-Depolarizing NMBAs



What are the Main Benefits of NMBAs in Cases of Severe, Early ARDS?

- Provide improved adaptation to the ventilator through increased thoracopulmonary compliance.
- Increase FRC, and decrease intrapulmonary shunt.
- Provide uniform distribution of pulmonary perfusion and pressures, favoring the perfusion of ventilated areas.
- Limit over-distention of high-compliance lung regions and recruit areas of smaller compliance.
- Decrease muscular oxygen consumption by decreasing ventilator asynchrony.
- Decrease production of proinflammatory cytokines in lungs and blood.
- Provide protective role against ventilator-induced trauma, including decreased incidence of pneumothoraces [1].

Table 6.1 Ventilatory and non-ventilatory strategies to avoid VILI in patients with ARDS. *PBW* Predictive body weight, *Pplat* End-inspiratory pressure, *PL* Transpulmonary pressure (the difference between Pplat and esophageal pressure), *ΔP* Respiratory system driving pressure (the difference between Pplat and PEEP), *Crs* Respiratory system compliance

Strategy	Target	Rationale-considerations
Ventilator strategies		
Tidal volume (VT)	≤6 mL/kg/PBW	Low VT improves outcomes in patients with ARDS.
	Pplat <30 cmH_2O	Pplat as a surrogate of stress
	PL at end-inspiration <18–20 cmH_2O	The stress in the lungs at a given lung volume. Consider in patients with suspected low chest wall compliance
	ΔP (driving pressure) <14 cmH_2O	Individualizes VT to lung size (Crs). The strongest predictor of mortality in recent studies
PEEP	Individualized based on the assessment of lung recruitability	Improves heterogeneity by recruiting closed alveoli and preventing cyclical collapse. Consider higher PEEP in patients with high lung recruitability
Non-ventilator strategies		
Prone position	16 h/sessions	Increases lung homogeneity and size of aerated lung improves V/Q mismatch and decreases shunt. Consider proning early in the course of mechanical ventilation in patients with moderate to severe ARDS
Neuromuscular blockade	<48 h by continuous infusion	Consider in patients with severe hypoxemia, significant patient-ventilator asynchrony that precludes lung-protective ventilation, and in patients with markedly high respiratory drive despite deep sedation

Drug interactions with NMB

Drugs Decreasing the Activity of NMBAs

- Calcium.
- Carbamazepine.
- Phenytoin.
- Ranitidine.
- Theophylline.

Drugs prolonging the activity of NMBAs

- Antimicrobials.
- Cardiac Medications: β-Blockers, calcium channel blockers, procainamide, quinidine, and furosemide.
- Immunosuppressants [1].

What is the Complications of NMBAs

Prolonged Weakness

- Following a trend in creatine kinase concentration every 48–72 hours may help assess the presence of myopathy secondary to paralysis and prolonged immobilization.
- A creatine kinase concentration should not be solely relied on for the presence of myopathy, and daily determination of the need for the NMBA should still be considered, even with a normal creatine kinase [1].
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Corneal Abrasions

- Paralysis eliminates the ability of the eyes to close and blink, increasing the risk of corneal ulcerations and infection.
- Prophylactic eye protection must be used in all patients on NMBAs
  (e.g., lubricating eye ointments or eye covers) [1].

Thrombosis

- Patients receiving an NMBA may be up to 8 times more likely to have a DVT than those not on an NMBA.
- Prophylaxis for a DVT must be provided for all patients on an NMBA [1].

Awareness

- Patients must be deeply sedated before initiating an NMBA.
- weird dreams, fear, resistance of restraints, thoughts of life and death, and pain [1].

Resistance to Paralysis and/or Potentiation

- Certain disease states may produce an up-regulation in acetylcholine skeletal muscle receptors, leading to higher-than-normal doses of the NMBA (e.g., musclet rauma, muscle atrophy, burns).
- Acid-base disorders, electrolyte imbalances, and adrenal insufficiency may also cause unpredictable alterations in dosing requirements [1].

Anaphylaxis

- If an allergic reaction is suspected, skin prick testing for the NMBA against a control can be done within 6 weeks of the reaction [1-3].

References

1. Critical Care pharmacy preparatory review and recertification course book 2025.
2. Intensive Care fundamentals 2023 book.
3. Almsnsura clinical pharmacology 2016 book.