



A conference that is for us and by us

Emergency Medicine Pharmacotherapy with Resuscitation (EMPowerRx) Conference



ROC SUCCS: REASONS TO USE SUCCINYLCHOLINE OVER ROCURONIUM FOR RAPID SEQUENCE INTUBATION IN THE EMERGENCY DEPARTMENT

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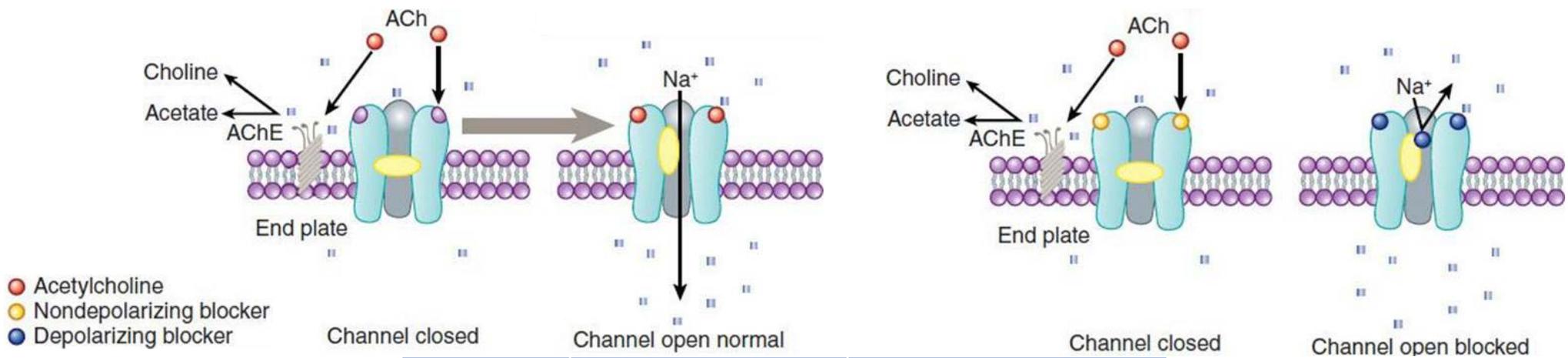
Yale New Haven Hospital



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Background- mechanism and pharmacokinetics

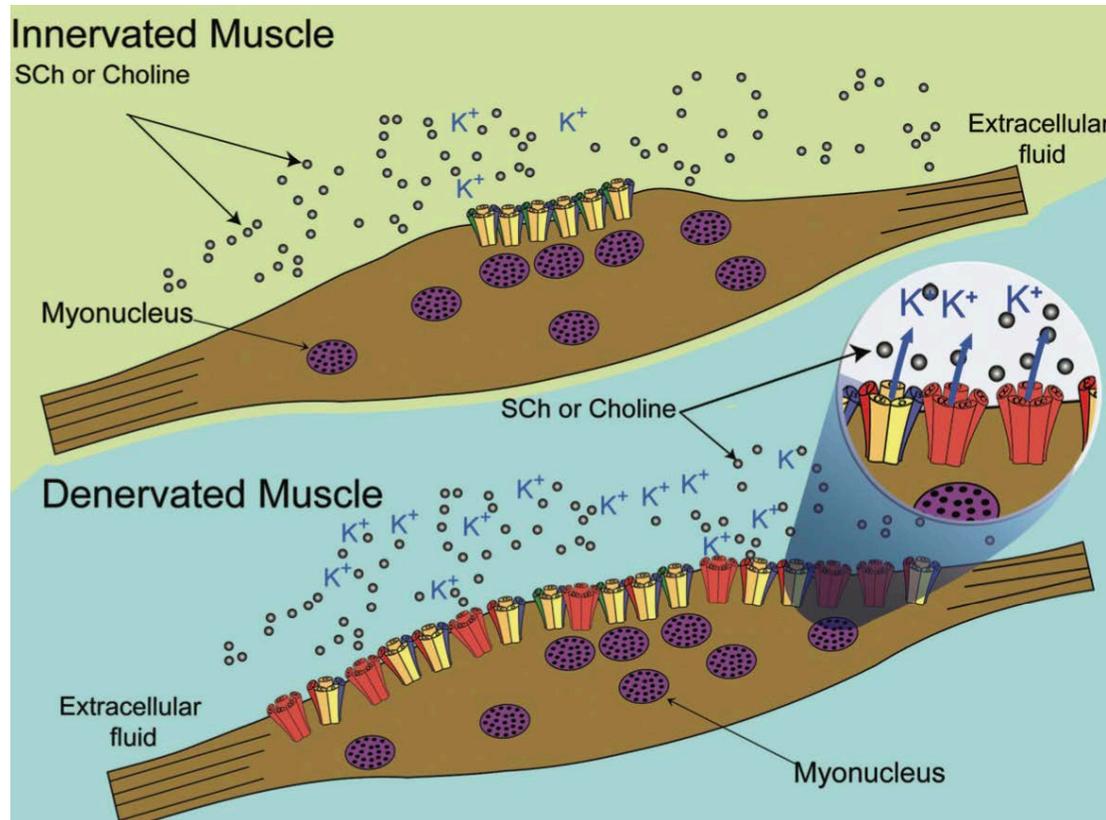
Succinylcholine is a **depolarizing** paralytic



	Succinylcholine	Rocuronium
Dose	1-2 mg/kg IV	0.6-1.2 mg/kg IV
Onset	30-60 seconds	1-2 minutes
Duration	6-10 minutes	30-90 minutes

Succinylcholine and hyperkalemia

Associated with upregulation of muscle nicotinic acetylcholine receptors



- Depolarization with succinylcholine results in the efflux of intracellular potassium into the plasma
 - Denervating, crush, or burn injuries
 - Immobilization
- Increase in potassium of 0.5-1 mEq/L
- Upregulation of these receptors is not immediate
 - Levels required to cause hyperkalemia take at least 48-72 hours

Wartier et al. *Anesthesiology*. 2006;104:158-169.

Succinylcholine and hyperkalemia

- Although hyperkalemia can be defined as a serum potassium >5.5 mEq/L, toxicity is often seen at higher levels
 - Symptoms develop around 6.5-7 mEq/L
 - Cardiovascular instability may occur at levels as low as 6 mEq/L, but typically occurs around 8 mEq/L
- Zink, et al (1995) reviewed the potassium levels before and after 100 patients were intubated with 1-1.5 mg/kg succinylcholine in the emergency department
 - Excluded patients that had trauma or burns for >24 hours
 - Serum potassium increased in 46 patients, decreased in 46 patients, and was not changed in 8 patients
- Review published by Sushma, et al (2000) concluded that in the absence of additional risk factors, succinylcholine is safe patients with renal dysfunction

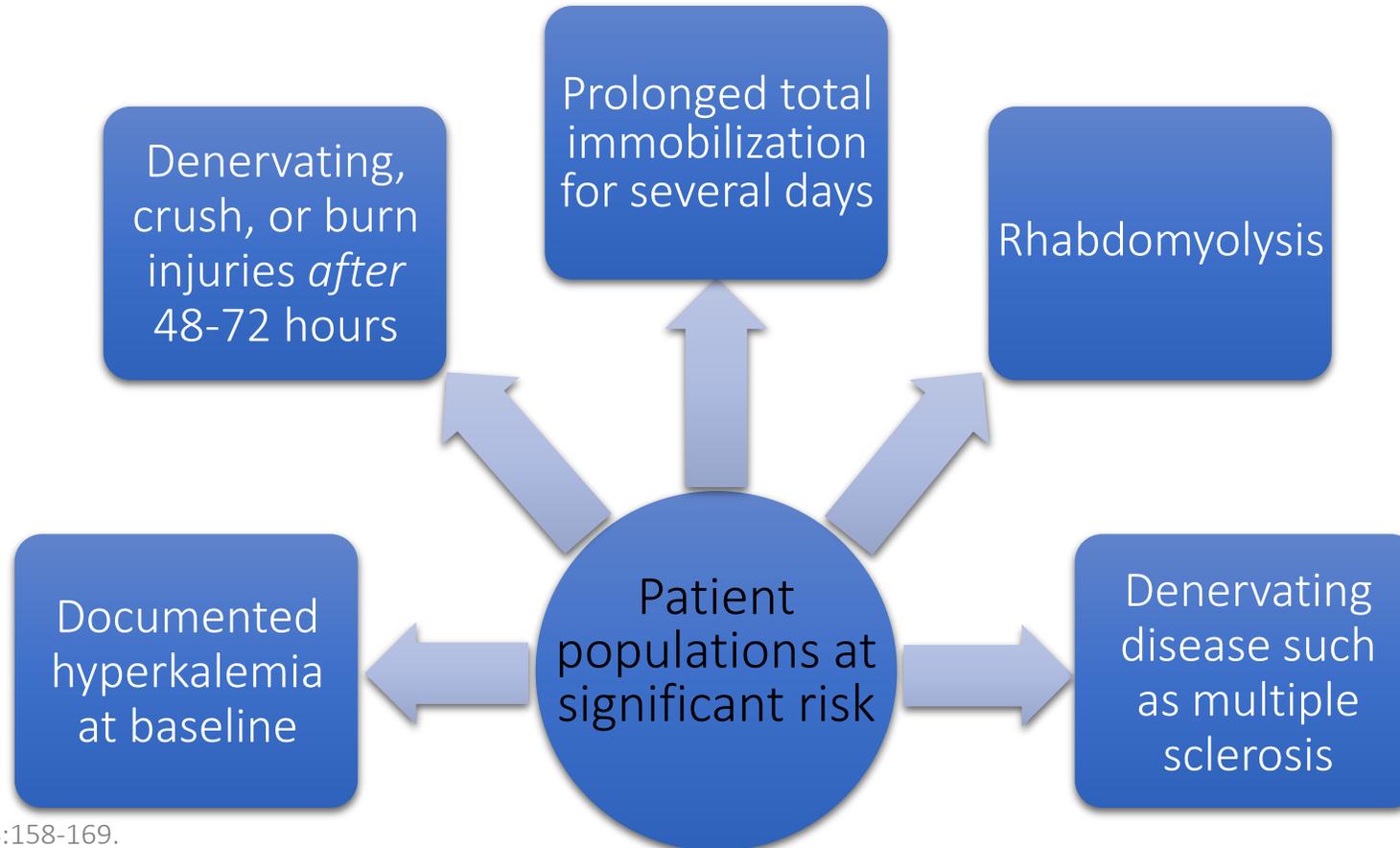
Wartier et al. *Anesthesiology*. 2006;104:158-169.

Zink et al. *Acad Emerg Med*. 1995;2:974-978.

Sushma et al. *Anesthesia & Analgesia*. 2000;91(1):237-241.

Succinylcholine and hyperkalemia

Degree of hyperkalemia seen after administration of succinylcholine is unlikely to result in clinically significant complications in the majority of patient populations



Wartier et al. *Anesthesiology*. 2006;104:158-169.

ED-AWARENESS Study

Study design

Single-center, prospective, observational cohort study of 383 mechanically ventilated ED patients

Objective

Assess the prevalence of awareness with paralysis

Results

Prevalence was 2.6% (10/383) overall

Exposure to rocuronium was significantly different between patients who experienced awareness (70%) versus the rest of the cohort

– OR 5.1; 95% CI 1.30 to 20.1

Use of longer-acting neuromuscular blocking agents are a risk factor for awareness with paralysis

Studies have shown that compared to succinylcholine, patients who receive rocuronium typically receive less analgesia and sedation, and initiation is delayed

- One multicenter observational study found that overall following RSI, 80% of patients did not receive adequate sedation and 30% didn't have any sedation at 120 minutes

Pappal et al. *Ann Emerg Med.* 2021;77:532-544.

Groth et al. *J Crit Care.* 2018;45:65-70.

Conclusion



Despite the known potential adverse effects associated with succinylcholine, they are likely only clinically significant in special patient populations at significantly increased risks



Prolonged paralysis with non-depolarizing paralytics is a risk factor for delay in appropriate sedation and analgesia, increasing the risk of awareness with paralysis



The short duration of action of succinylcholine in comparison to rocuronium allows for more complete physical and neuro examination following rapid sequence intubation

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