Review of Rapid Sequence Intubation & Medication Controversies

A presentation for HealthTrust Members
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Learning Objectives for Pharmacists & Nurses

1. Recall the clinical importance of rapid sequence intubation (RSI) and scenarios in which RSI should be utilized
2. Identify medications utilized in RSI and appropriateness of agents in different clinical scenarios
3. Recognize medication-related controversies in RSI and current evidence related to RSI medications

Learning Objectives for Pharmacy Technicians

1. Recall medications utilized in rapid sequence intubation (RSI)
2. Identify appropriate dosing for medications utilized in RSI
3. Recognize preparation and storage requirements for commonly used medications for RSI

Endotracheal (ET) Intubation

Purpose

Effective airway management to ensure adequate oxygenation and ventilation

Indications

- Persistent hypoxemia despite supplemental oxygen
- Airway obstruction
- Severe cognitive impairment (GCS ≤8)
- Severe hemorrhagic shock
- Cardiac arrest
- Pre-operative management

General Methods

- Preoxygenation with non-invasive ventilation to maintain O_2 saturations >90%
- Laryngoscope is inserted into mouth and is used to visualize airway
- Endotracheal tube (ETT) is inserted and moved past epiglottis into trachea
- ETT is attached to ventilator

J Emerg Med. 2011;40(6):661-667;
Ann Pharmacother. 2014;48(1):62-76

Types of Endotracheal Intubation

	Traditional Induction then Intubation	Awake Intubation	Delayed Sequence Intubation	Rapid Sequence Intubation
Indication	No known or suspected difficult airway, no ‘full stomach’	Known or suspected difficult airway	Patient agitated or intolerant of pre-oxygenation	High risk of aspiration, need for quick intubation
Risks	Pulmonary aspiration in between induction and endotracheal tube placement	Patient may not be amenable; gagging, vomiting, aspiration	Increased aspiration risk compared to RSI	Hypoxemia, unsuccessful intubation post paralysis, cardiovascular collapse

Anesth Analg. 2010 May 1;110(5):1318-25;
J of Emerg Med. 2011 Jun;40(6):661-667;
West J Emerg Med. 2019 May; 20(3): 466–471

Rapid Sequence Intubation (RSI)

Purpose

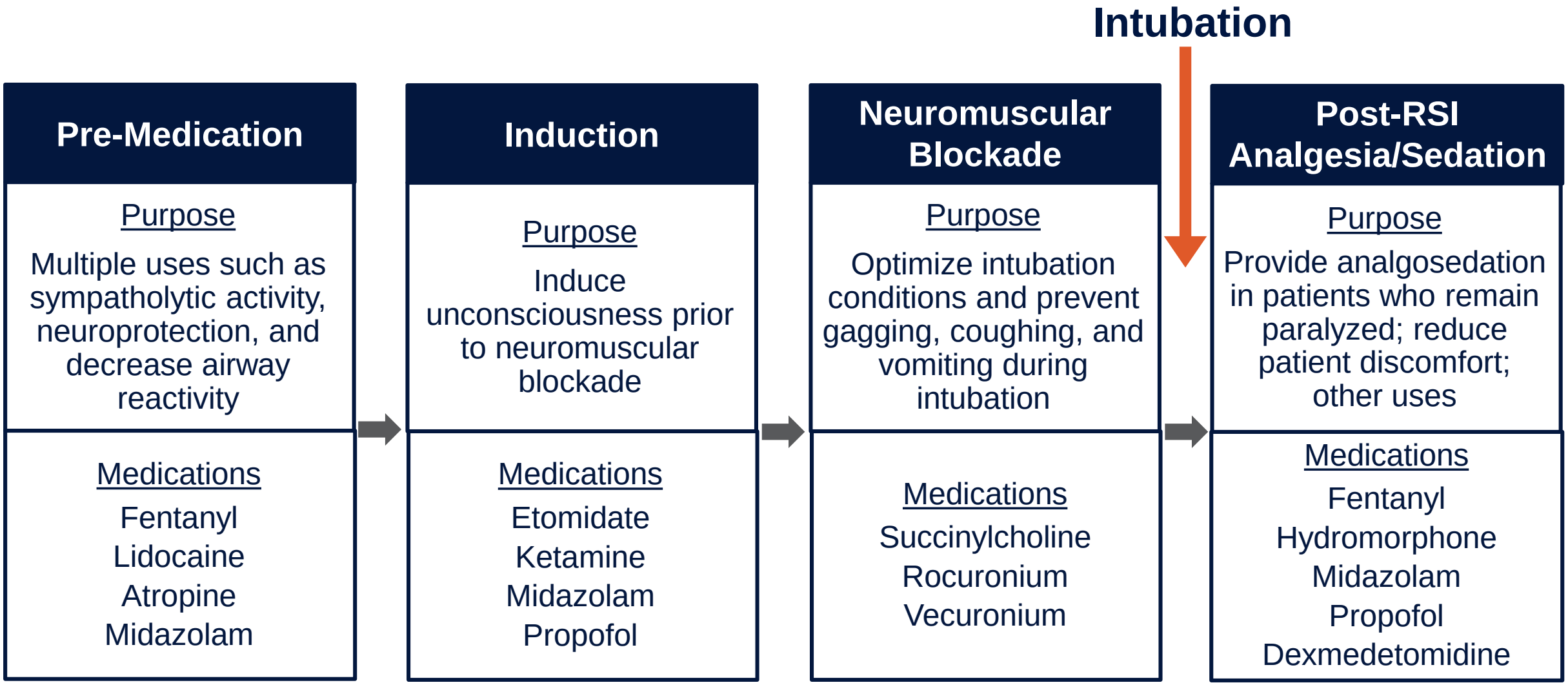
Rapidly secure airway by simultaneously administering induction agent and neuromuscular blocking agent just prior to endotracheal tube insertion

Guidelines

Society of Critical Care Medicine Clinical Practice Guidelines for Rapid Sequence Intubation in the Critically Ill Adult Patient

Ann Pharmacother. 2014;48(1):62-76;
Crit Care Med. 2023 Oct;51(10):1411-1430.

Medication Use Before, During & After RSI



Crit Care Med. 2023 Oct;51(10):1411-1430

Question #1 for Pharmacists & Nurses

Which of the following scenarios is NOT a reason to perform RSI?

A. Risk of aspiration
B. Cardiac arrest
C. Airway protection
D. Uncontrolled pain

Question #1 for Pharmacists & Nurses

Which of the following scenarios is NOT a reason to perform RSI?

A. Risk of aspiration

B. Cardiac arrest

C. Airway protection

D. **Uncontrolled pain**

Question #1 for Pharmacy Technicians

Which of the following medications are NOT commonly used in RSI?

A. Etomidate

B. Dexamethasone

C. Succinylcholine

D. Ketamine

Question #1 for Pharmacy Technicians

Which of the following medications are NOT commonly used in RSI?

A. Etomidate

B. Dexamethasone

C. Succinylcholine

D. Ketamine

Ideal Properties of Medications for RSI

Pharmacodynamic (PD)	Pharmacokinetic (PK)
• Minimal side effects • Negligible hemodynamic effects • Reversible effects	• Minimal renal or hepatic metabolism and excretion • Quick onset (30 to 60 seconds) • Short duration (3 to 5 minutes)

Ann Pharmacother. 2014;48(1):62-76

Premedications

Purpose

- Sympathetic nervous system (SNS) is stimulated in response to endotracheal intubation
- Medications typically administered 3 minutes prior to RSI can help alleviate the SNS response

Drug	Indication	Dose	Consider in…	Avoid in…
Fentanyl	Prevents tachycardia; provides analgesia	1 to 3 mcg/kg IV	CV disease, hypertensive, tachycardia	Hypotensive
Atropine	Prevents bradycardia	0.01 mg/kg IV	Bradycardia, increased secretions	Tachycardia
Lidocaine	Bronchodilation, cough suppression, prevents ICP elevation	1.5 mg/kg IV	Elevated ICP	Bradycardia, bradyarrhythmia

Ann Pharmacother. 2014;48(1):62-76

Induction Agents

Purpose

To induce unconsciousness prior to paralysis

SCCM Guideline Recommendation

"…advise administering a sedative-hypnotic induction agent when a NMBA is used for intubation."

Risks

- Hemodynamic effects
- Other adverse effects based on agent (adrenal suppression, emergence reactions, laryngospasm, etc.)

Crit Care Med. 2023 Oct;51(10):1411-1430

Induction Agents

Agent	Propofol	Ketamine	Etomidate	Midazolam
Mechanism of Action	CNS depressant, presumably through $GABA_A$ agonism and NMDA receptor blockade	Noncompetitive NMDA receptor antagonist that blocks glutamate activity to produce sedation and analgesia	Anesthetic that produces hypnosis, amnesia, and inhibition of nociceptive responses by increasing $GABA_A$ responsiveness	Rapid acting benzodiazepine that produces sedation and anterograde amnesia through enhancing GABA's inhibitory effects at the receptor
Dose	1 to 3 mg/kg IV	1 – 2 mg/kg IV or 4 mg/kg IM	0.3 mg/kg IV	0.1 to 0.3 mg/kg IV or IM
Onset	10 – 50 seconds	0.5 – 1 minute	30 – 60 seconds	1 – 5 minutes
Duration	5 – 10 minutes	5 – 15 minutes (full recovery: 1-2 hours)	3 – 5 minutes	7 – 75 minutes

| *Ann Pharmacother*. 2014;48(1):62-76; Lexicomp (n.d)

CNS: central nervous system; GABA: gamma-aminobutyric acid; NMDA: N-methyl-D-asparate

Induction Agents

Agent	Propofol	Ketamine	Etomidate	Midazolam
Side Effects	Severe hypotension	Hallucinations, emergence reactions, increased blood pressure/heart rate, hypotension laryngospasm, sialorrhea	Adrenal suppression, myoclonus, transient skeletal movements, injection site pain	Respiratory depression
Consider in…	Option for patients with elevated ICP, head injuries	Hypotensive, asthma, no IV access	Hypotensive	No IV access
Avoid in…	Hypotensive	Hypertensive	Adrenal insufficiency	Hemodynamically unstable

ICP: Intracranial pressure

Ann Pharmacother. 2014;48(1):62-76;
Lexicomp (n.d)

Question #2 for Pharmacists & Nurses

Which of the following pharmacokinetic properties would be most ideal for an induction medication utilized in RSI?

A. Rapid onset of action
B. Quick offset of action
C. Long duration of activity
D. A & B

Question #2 for Pharmacists & Nurses

Which of the following pharmacokinetic properties would be most ideal for an induction medication utilized in RSI?

A. Rapid onset of action

B. Quick offset of action

C. Long duration of activity

D. A & B

Question #2 for Pharmacy Technicians

Which of the following induction agents can be administered intramuscularly?

A. Etomidate
B. Ketamine
C. Midazolam
D. B & C

Question #2 for Pharmacy Technicians

Which of the following induction agents can be administered intramuscularly?

A. Etomidate
B. Ketamine
C. Midazolam
D. **B & C**

Controversy #1: Etomidate and Mortality

Role of Endogenous Glucocorticoids

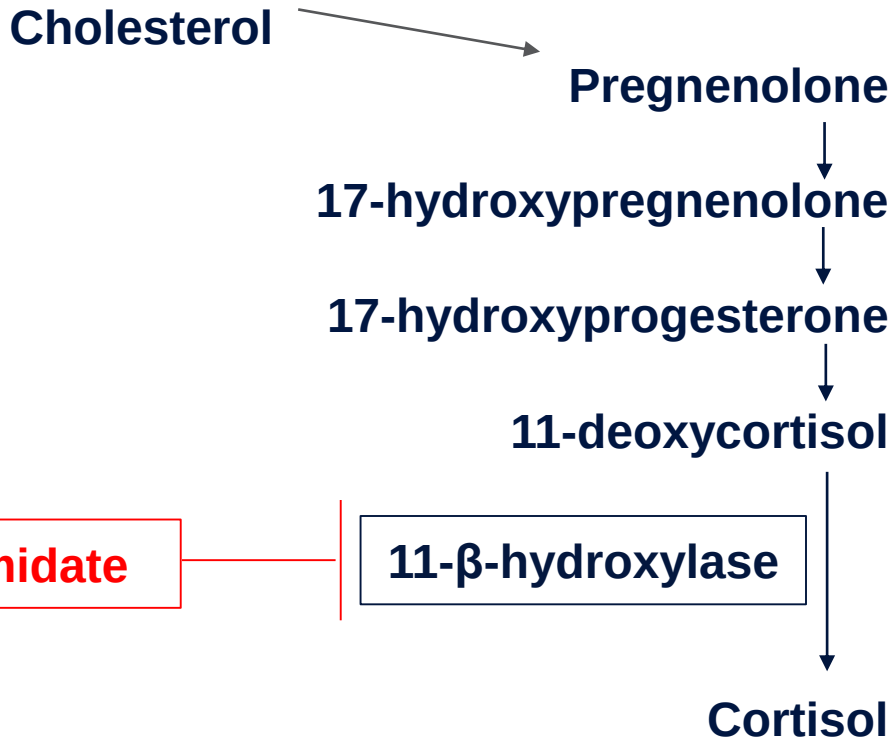
Suppress inflammatory cytokine release, prevent induction of NO synthase and enhance vasoactive responsiveness to catecholamines

Etomidate-induced Adrenal Suppression

Inhibits 11-β-hydroxylase in adrenal cortisol synthesis for at least 24 – 48 hours

Critical illness related corticosteroid insufficiency (CIRCI)

- Dysregulated systemic inflammation from inadequate intracellular glucocorticoid activity
- Increased risk of multi-organ failure and mortality



Am J Respir Crit Care Med. 2001;163(07):1520-1523;
Crit Care Med. 2017;45(12):2078-2088.

Etomidate & Mortality in Patients with Sepsis

Gu et al, 2015	
Study Design	Meta-analysis of 18 studies (2 RCTs, 3 post hoc analyses of RCTs and 13 cohort studies) in adult critically ill patients with sepsis undergoing RSI
Intervention	Etomidate versus comparator sedative (ketamine or midazolam) or no agent
Outcomes	All-cause mortality (either hospital or 28-day)
Population	5,552 patients
Results	No association with increased mortality in patients with sepsis in RCTs (RR, 1.20; 95%CI 0.84-1.72) and observational studies (RR, 1.05; 95% CI 0.97-1.13).
Critique	• Heterogeneity low in primary outcome, however, baseline characteristics, severity of illness, and type of comparative induction agent varied across studies. • Secondary outcomes could not be assessed due to sparse reporting

Chest. 2015;147(2):335-346

Etomidate & Mortality in Critically Ill Patients Based on Severity of Illness

Albert at al, 2021	
Study Design	Meta-analysis of 29 trials (5 RCTs, 9 post hoc analyses, 15 retrospective trials) in critically ill adult patients undergoing RSI • Subgroup analysis based on predicted mortality rate of >44%
Intervention	Etomidate versus comparator anesthetic induction agents
Outcomes	28-day survival
Population	8584 patients • Indication: Sepsis, critical illness, trauma, emergency
Results	• ↑ relative mortality rate (RR 1.20, 95% CI: 1.12 - 1.29, $p < 0.001$) in those with a predicted mortality of >44%: • No significant difference in mortality in those with a predicted mortality <44%.
Critique	• Largely based on subgroup analyses with moderate and low Grade criteria. • Overlapping studies included in other meta-analyses showed no difference in mortality

J of Intensive Care Med. 2021;36(10):1124-1129

Etomidate & Mortality in Critically Ill Patients

Kotani et al, 2023	
Study Design	Meta-analysis of 11 RCTs in critically ill adult patients undergoing RSI
Intervention	Single dose of etomidate versus any comparator induction agent (ketamine, propofol, midazolam, or thiopental)
Outcomes	Mortality at the time point defined by the trial authors (7-day, 28-day, 30-day, or hospital)
Population	2,704 patients • Place of intubation varied: ICU, ED, prehospital
Results	• ↑ mortality (23%) vs. (20%); RR = 1.16; 95% CI, 1.01–1.33) • ↑ adrenal insufficiency (147/695 [21%] vs. 69/686 [10%]; RR = 2.01; 95% CI, 1.59–2.56)
Critique	• Overlapping studies included in other meta-analyses showed no difference in mortality • Some studies that included ketamine allowed etomidate due to inadequate sedation.

J Crit Care. 2023;77:154317

Etomidate & Mortality: Meta-analysis Comparison

Trial	Gu et al, 2015	Albert et al, 2021	Kotani et al, 2023
Studies included	2 RCTs, 3 post hoc analyses of RCTs and 13 cohort studies	5 RCTs, 9 post hoc analyses, 15 retrospective trials	11 RCTs
Comparator	Ketamine, midazolam, or not reported	Not reported	Ketamine, propofol, midazolam, or thiopental
Population	Critically ill patients with sepsis	Critically ill patients in ICU	Critically ill patients (prehospital, ED, ICU)
Outcome on Mortality	No association	↑ (in high-predicted mortality group only)	↑

Chest. 2015;147(2):335-346;
J of Intensive Care Med. 2021;36(10):1124-1129;
J Crit Care. 2023;77:154317

Etomidate & Mortality

Conclusion

- Inconsistent data to conclude etomidate-induced adrenal suppression is associated with an increase in mortality

SCCM Guideline Recommendation

- “We suggest there is no difference between etomidate and other induction agents administered for RSI with respect to mortality or the incidence of hypotension or vasopressor use in the peri-intubation period and through hospital discharge”

Overall Takeaway

- Underlying comorbidities and severity of illness on presentation may increase the risk of adverse outcomes associated with etomidate-adrenal suppression

Crit Care Med. 2023 Oct;51(10):1411-1430

Controversy #2: Ketamine vs. Etomidate

Ketamine vs etomidate

- Hemodynamic effects and lack of adrenal suppression of ketamine make it a suitable option for RSI; however the side effects are not benign.

Controversy

- Is ketamine a better induction agent than etomidate based on…
  - Mortality
  - SOFA score
  - Sepsis
  - Vasopressor free days
  - Hypotension

Ann Pharmacother. 2014;48(1):62-76

Ketamine vs. Etomidate on Mortality in Trauma Patients in the ED

Upchurch et al, 2017	
Study Design	Before-and-after retrospective study of adult trauma patients undergoing RSI in the ED • A priori subgroup analysis of GCS <15, penetrating trauma, TBI, major trauma defined as >15 on the Injury Severity Score (ISS) and SBP <100 mmHg at presentation.
Intervention	Ketamine 1 – 2 mg/kg versus etomidate 0.3 mg/kg
Outcomes	Primary: Hospital mortality Secondary: ICU-, ventilator-, vasopressor-free days, and hospital-acquired sepsis at 28 days
Population	968 patients • Median ISS 22, median APACHE II score 21.5. No difference in baseline characteristics
Results	• No difference in hospital mortality between ketamine (20.4%) and etomidate (17.3%) (OR: 1.41; 95% CI: 0.92, 2.16) nor amongst subgroups • ↓ hospital-acquired sepsis in ketamine group (aOR: 0.72; 95% CI: 0.52, 0.99) • ↑ vasopressor-free days in etomidate group (aOR: 0.74; 95% CI: 0.58, 0.95)
Critique	• Only assessed trauma patients • Before-and-after study

Ann Emerg Med. 2017; 69(1): 24–33.e2

Ketamine vs. Etomidate on SOFA Score in ED Patients

Knack et al, 2023	
Study Design	Single-center, parallel-group, RCT in ED patients undergoing RSI
Interventions	Ketamine 2 mg/kg versus etomidate 0.3 mg/kg
Outcomes	Primary: Maximum SOFA score during first 3 days of hospitalization Secondary: In-hospital mortality at 30 days, successful intubation on the first attempt, hypoxemia, and post-intubation hypotension
Population	129 patients • Primary indication for RSI was medical (53%), trauma (19%), or overdose (19%) • Sepsis criteria met in 14% of the ketamine group and 26% in the etomidate group.
Results	• No difference in maximum median SOFA score (ketamine: 6.5 (IQR 5 - 9), etomidate: 7 (IQR 5 - 9) (95% CI –1.4 to 1.1; p = 0.79)). • No difference in secondary outcomes
Critique	• May not generalize to patients with a higher likelihood of cardiovascular collapse • Primary outcome was SOFA score but majority of patients did not have sepsis

J Emerg Med. 2023;65(5):e371-e382.

Ketamine vs. Etomidate on Mortality in Critically Ill Patients

Koroki et al, 2024	
Study Design	Meta-analysis of 8 trials (7 RCTs and 1 propensity-matched study) in critically ill adult patients undergoing RSI
Interventions	Ketamine 1-2 mg/kg versus comparator (etomidate)
Outcomes	Primary: All-cause mortality Secondary: SOFA, ventilator and vasopressor-free days at day 28, post-induction MAP, intubation success on first attempt
Population	2978 patients • Place of intubation varied: ICU, ED, prehospital
Results	• No difference in mortality (RR, 0.93; 95% CI, 0.79–1.08) • No difference in secondary outcomes
Critique	• Heterogeneity amongst the studies • Studies did not report psychological side effects

Crit Care 28, 48 (2024)

Ketamine vs. Etomidate

Conclusion

- Not enough data to conclude one agent is superior to the other
  - Small populations and limited randomized controlled trials
  - Indication for RSI varies amongst studies
  - Mortality effects of one agent over the other unclear

SCCM Guideline Recommendation

- “No difference between etomidate and other induction agents administered for RSI with respect to mortality or the incidence of hypotension…”

Overall Takeaway

- Not enough data to use one agent over the other
- Patient characteristics upon presentation should be used to guide selection

| *Crit Care Med.* 2023 Oct;51(10):1411-1430

Neuromuscular Blocking Agents (NMBA)

Purpose

Improve intubating conditions by muscle paralysis to ensure proper airway management

SCCM Guideline Recommendation

“We recommend administering an NMBA when a sedative-hypnotic induction agent is used for intubation.”

Risks

- Inability to successfully intubate
- Paralysis without sedation leading to trauma

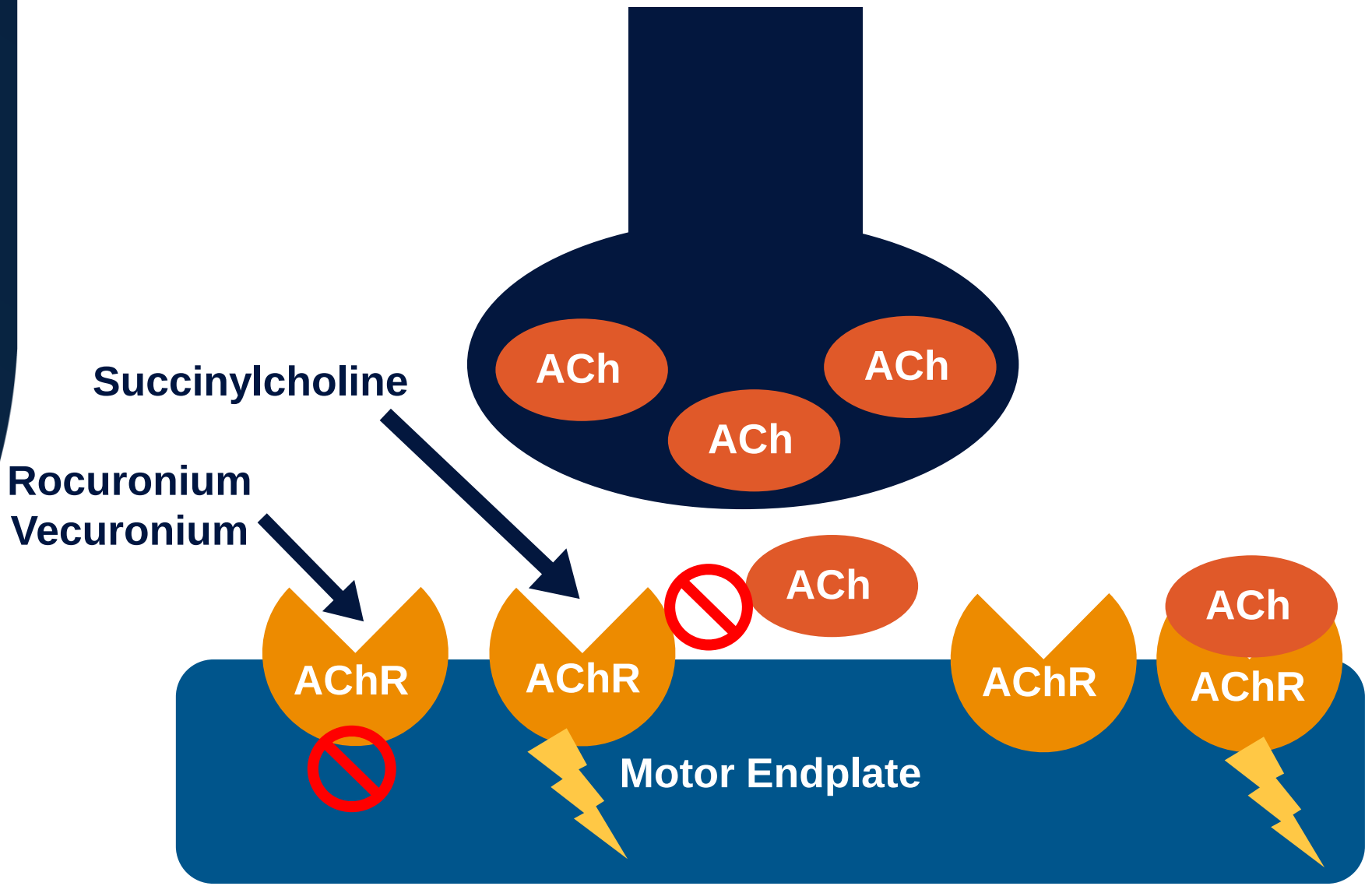
Crit Care Med. 2023 Oct;51(10):1411-1430

NMBAs

Agent	Rocuronium	Vecuronium	Succinylcholine
Mechanism of Action	Nondepolarizing NMBA that blocks acetylcholine (Ach) from binding to receptors on motor endplate	Nondepolarizing NMBA that blocks Ach from binding to receptors on motor endplate	Depolarizing NMBA resembling Ach that binds to and continuously depolarizes the motor endplate providing a sustained skeletal muscle paralysis
Dose	1 – 1.2 mg/kg IV	0.1 – 0.2 mg/kg IV	1.5 mg/kg IV
Duration	20 – 120 minutes, prolonged with higher doses or hypothermia	45 – 65 minutes, prolonged with hypothermia and hepatic dysfunction	3 – 6 minutes

Ann Pharmacother. 2014;48(1):62-76;
Lexicomp (n.d)

NMBA Action at Motor Endplate



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NMBA

Agent	Rocuronium	Vecuronium	Succinylcholine
Side Effects	Minimal side effects: tachycardia, hypertension or transient hypotension	Minimal side effects: bradycardia, circulatory shock, edema, hypersensitivity reaction	Malignant hyperthermia, hyperkalemia, cardiac arrhythmia, increased ICP, bradycardia, hypotension
Consider in…	Contraindications to succinylcholine	Rocuronium and succinylcholine unavailable. Doesn't require refrigeration	Inability to mask ventilate and if no contraindications exist
Avoid in…	Patients in which a more rapid neurologic exam warranted	Rocuronium or succinylcholine available	Malignant hyperthermia, hyperkalemia or conditions that may increase K (ESRD, crash/ burn injuries, rhabdomyolysis)

Ann Pharmacother. 2014;48(1):62-76;
Lexicomp (n.d)

Controversy #3: Succinylcholine vs. Rocuronium

Succinylcholine vs rocuronium

- Succinylcholine associated with quick onset and short offset but contains adverse events that can be potentially fatal
- Rocuronium associated with clean side effect profile but has long duration potentially leading to awareness with paralysis

Controversy

- Is there a difference between succinylcholine and rocuronium when it comes to mortality, first-pass intubation success (FPS), adverse events, risk of awareness with paralysis?

Succinylcholine vs. Rocuronium in Critically Ill Patients

Marsch et al, 2011	
Study Design	Prospective, randomized, controlled, single-blind trial in critically ill patients undergoing RSI
Interventions	Succinylcholine 1 mg/kg versus rocuronium 0.6 mg/kg
Outcomes	Primary: Incidence of oxygen desaturations Secondary: Duration of intubation sequence, incidence of failed first intubation attempts
Population	401 patients • Primary indication for RSI was sepsis (13%)
Results	• No difference in oxygen desaturations (succinylcholine (37%); rocuronium (34%); p=0.67) • ↓ duration of intubation sequence in succinylcholine group (81±38 seconds) versus rocuronium group (95±45 seconds) (p=0.002) • No difference in failed first intubation attempts (succinylcholine (10%); rocuronium (17%); p=0.4)
Critique	• Slightly lower doses than recommended in practice • Exclusion criteria

Crit Care. 2011;15(4):R199

Succinylcholine vs. Rocuronium in ED Patients

April et al, 2018	
Study Design	Prospective observational study in ED patients 14 years and older undergoing RSI
Interventions	Succinylcholine versus rocuronium
Outcomes	Primary: First-pass intubation success (FPS) Secondary: Incidence of adverse events
Population	4,075 patients (2,275 received succinylcholine and 1,800 received rocuronium) • Succinylcholine: younger, and more likely to be intubated by a more experienced provider
Results	• No difference in FPS between succinylcholine (87%) and rocuronium (87.5%) (aOR, 0.9; 95% CI, 0.6 to 2.6) • No difference in adverse events (adjusted odds ratio 1.1; 95% CI 0.9 to 1.3)
Critique	• Significant difference in baseline characteristics • Self-reported data, potential for recall bias

Ann Emerg Med. 2018;72(6):645-653.

Succinylcholine vs. Rocuronium

Conclusion

- Majority of studies did not find a difference in FPS, hemodynamic changes and oxygen desaturations

SCCM Guideline Recommendation

- "…suggest administering either rocuronium or succinylcholine for RSI when there are no known contraindications to succinylcholine."

Overall Takeaway

- No difference in clinical practice
- Succinylcholine may be ideal if difficult airway is known or suspected

Crit Care Med. 2023 Oct;51(10):1411-1430

Controversy #4: Succinylcholine Use in TBI

Elevated Intracranial Pressure in traumatic brain injury (TBI)

- Can worsen mental status/hypoxemia further leading to need of intubation
- Can worsen intracerebral hemorrhage and/or lead to coma, and death

Succinylcholine increases ICP

- Mechanism not completely understood
- Potentially due to increased cerebral flow due to mediation of afferent spinal fibers

Controversy

- Can succinylcholine be used in patients with TBI?

Pharmacotherapy. 2016;36(1):57-63

Succinylcholine & Mortality in TBI Patients in the ED

Patanwala et al, 2016				
Study Design	Retrospective cohort study of adult TBI patients undergoing RSI in the ED • Divided based on severity of TBI as indicated by the Abbreviated Injury Severity (AIS) of the head region with low-severity <4 and high severity ≥4			
Interventions	Succinylcholine versus rocuronium			
Outcome	In-hospital mortality			
Population	233 patients • Patients who received succinylcholine were younger and more hypotensive at baseline			
Results	Mortality	Low-severity TBI	High-severity TBI	95% CI
	Rocuronium	22%	23%	-18 – 20
	Succinylcholine	14%	44%	14 – 46
Critique	• Retrospective cohort study; cannot exclude possibility of selection bias • Significant differences in baseline characteristics			

Pharmacotherapy. 2016;36(1):57-63

Succinylcholine Use in TBI

Conclusions

- Few studies exist evaluating effect succinylcholine on elevated intracranial pressure and associated outcomes
- Inconclusive data on whether succinylcholine increases mortality due to increased ICP in TBI patients
  - Small study size, retrospective studies with low level of evidence
  - Results may not be extrapolated to ICU patients (with more readily available resources)

SCCM Guideline Recommendation

- "Future studies are needed to compare these two agents in the subset of patients with TBI."

Overall Takeaway

- Data inconclusive and impact of succinylcholine in TBI patients may not be clinically relevant

Crit Care Med. 2023 Oct;51(10):1411-1430

Question #3 for Pharmacists and Nurses

Which of the following are associated with succinylcholine?

A. Hypokalemia
B. Decreased intracranial pressure
C. Malignant hyperthermia
D. Long duration of action

Question #3 for Pharmacists and Nurses

Which of the following are associated with succinylcholine?

A. Hypokalemia

B. Decreased intracranial pressure

C. Malignant hyperthermia

D. Long duration of action

Question #3 for Pharmacy Technicians

Which of the following NMBA does NOT require refrigeration?

A. Vecuronium
B. Succinylcholine
C. Rocuronium
D. None of the above

Question #3 for Pharmacy Technicians

Which of the following NMBA do NOT require refrigeration?

A. **Vecuronium**
B. Succinylcholine
C. Rocuronium
D. None of the above

Post-intubation Sedation

Purpose

- To prevent awareness with paralysis (AWP) and prolong sedation following NMB
- Largest risk of AWP when using a short-acting induction agent (etomidate) with a longer-acting NMB (rocuronium)

SCCM Guideline Recommendation

"If post-intubation analgosedation provision is optimized with rocuronium, then we would not anticipate differences inpatient awareness after RSI."

Risks Associated with AWP

- Post-traumatic stress syndrome
- Depression
- Thoughts of suicide

Crit Care Med. 2022;50(10):1449-1460;
Crit Care Med. 2023 Oct;51(10):1411-1430

AWP in Mechanically Ventilated ED Patients

Fuller et al, 2022	
Study Design	A priori planned secondary analysis of a multicenter, prospective before-and-after clinical trial of mechanically ventilated adult patients that received a NMB for intubation in the ED
Outcome	Awareness with paralysis (AWP) assessed by Brice questionnaire
Population	388 patients • Most common comorbid condition was diabetes and psychiatric illness. • Most common place of intubation was in the ED and for a medical reason
Results	• AWP occurred in 20 (5.2%) of patients • ↑ AWP in patients receiving rocuronium (5.5%) compared to AWP in patients that received another NMBA (0.6%) (OR, 8.64; 95% CI, 1.11–67.15) • ↑ AWP in patients who were younger, had a psychiatric illnesses, and less severity of illness

Crit Care Med. 2022;50(10):1449-1460

Pharmacists' Role in Post-intubation Sedation

	Robey-Gavin et al, 2016	Amini et al, 2013
Purpose	Retrospective cohort study comparing rate of initiation of post-intubation analgesia post-RSI in ED patients. Subgroup analysis of RSI during ED pharmacists (EDP) duty hours	Retrospective cohort study assessing medication-use outcomes with or without a pharmacist's participation on the resuscitation team in trauma patients who underwent RSI with rocuronium
Outcome	Frequency of analgesia initiation	Time to sedative and analgesic provision after intubation with or without a pharmacist
Results	• ↑ interventions after pharmacist intervention from 20% to 49% (p=0.005)	• ↓ time to post-intubation sedation with a pharmacist (mean: 9 minutes) versus without a pharmacist (mean: 28 minutes) (p<0.007) • ↓ time to post-intubation analgesia with a pharmacist (mean: 21 minutes) versus without (mean: 44 minutes) (p=0.057)

J Emerg Med. 2016;50(2):308-314;
Am J Health Syst Pharm. 2013;70(17):1513-1517

Pharmacist Role in RSI

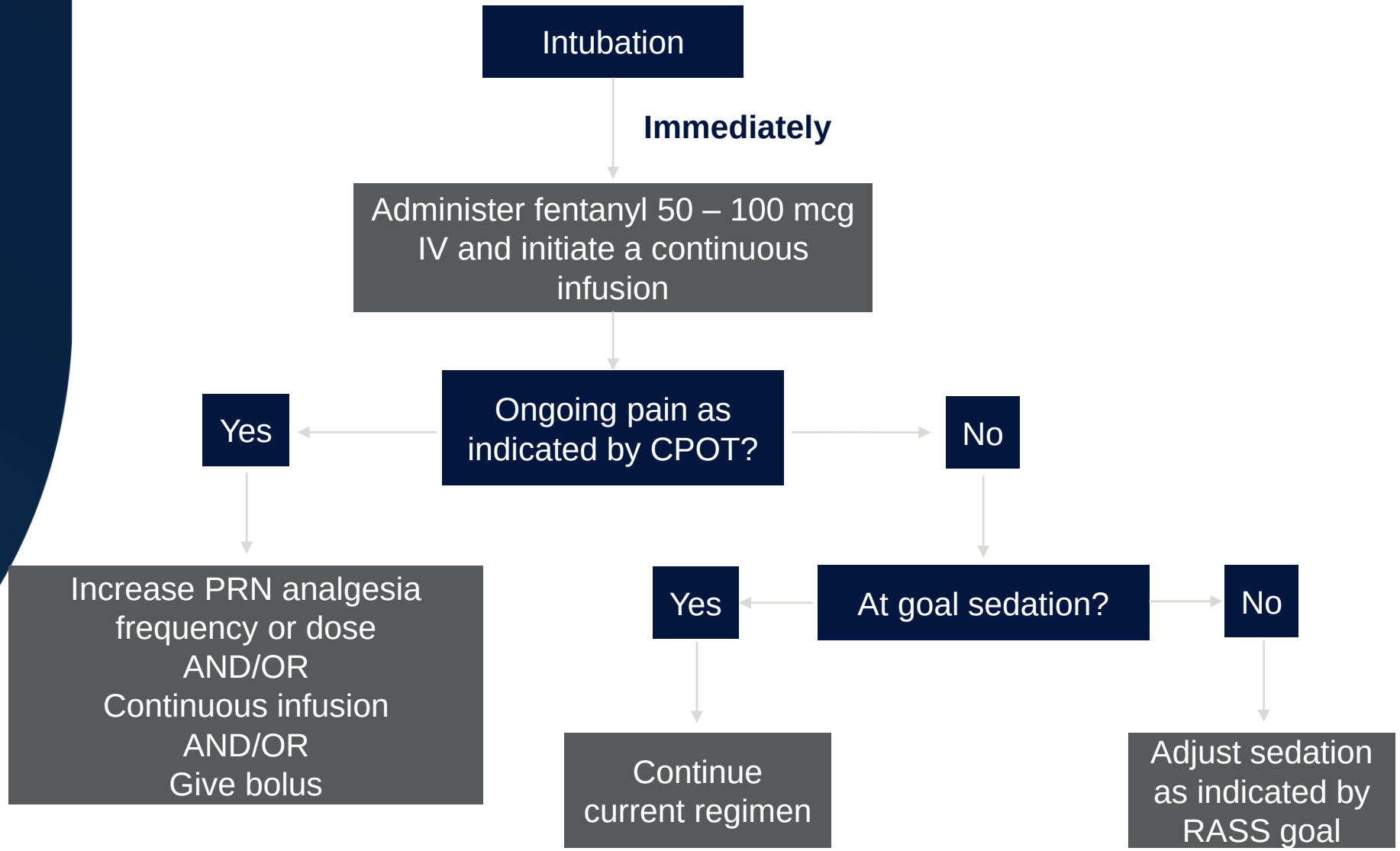
Purpose

- Patient-specific characteristics should be considered when selecting certain agents for RSI
- Pharmacists are best suited to help with agent selection, appropriate dosing, facilitation of medication delivery.

SCCM Guideline Recommendation

"…institutions should consider the implementation of protocolized care for RSI and incorporate personnel, such as clinical pharmacists, to help improve the timeliness of analgosedation."

Post-intubation Sedation



CPOT: critical care pain observation tool; RASS: Richmond agitation sedation scale

Emerg Med Clin North Am. 2019;37(3):545-556

Summary

- Pharmacist should consider properties of each RSI medication utilized in the entire RSI regimen
- Etomidate is known to cause adrenal suppression; evidence surrounding mortality effects is inconsistent
- Etomidate or ketamine can be used for induction, use patient characteristics, drug availability to guide selection
- Succinylcholine has ideal PK/PD properties for RSI; Rocuronium can be used when contraindication to succinylcholine exist but must consider duration of action
- Pharmacists play a vital role in RSI and can assist in appropriate medication selection given patient characteristics

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Thank you!

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