CME

Practice Guidelines

Rapid Sequence Intubation of Critically Ill Patients: Guidelines From the Society of Critical Care Medicine

Patrick Bagley, DO, and David Smith, DO

KEY POINTS FOR PRACTICE

- Positioning patients in a semi-Fowler position with the head and trunk raised may increase intubation success and decrease aspiration risk.
- Preoxygenation with high-flow nasal oxygen is effective and can be used throughout intubation. With severe hypoxemia, noninvasive positive pressure ventilation is recommended for preoxygenation.
- Before rapid sequence intubation, paralysis with a neuromuscular blocking agent (ie, succinylcholine or rocuronium) is recommended to increase intubation success and reduce vomiting risk.

From the *AFP* Editors

Emergency airway management is high-risk and involves multiple decisions. Rapid sequence intubation, which usually occurs after administration of a sedative-hypnotic agent and a neuromuscular blocking agent in rapid succession, should optimize the chance of successful intubation while reducing peri-intubation risks such as aspiration or hypotension. The Society of Critical Care Medicine developed guidelines to optimize rapid sequence intubation.

POSITIONING

Simulation studies suggest that sitting a patient up from the traditional supine position to a semi-Fowler position (ie, head and trunk raised) before intubation decreases aspiration risk, increases lung volumes, and improves intubation success through better views. The guideline suggests semi-Fowler positioning based on very low-quality evidence from conflicting studies. Although simulation and observational studies clearly demonstrate improved first-pass intubation success with semi-Fowler positioning compared with the supine position, the few randomized trials demonstrated no difference between the two positions.

PREOXYGENATION

Based on low-quality evidence, preoxygenation with 100% oxygen before intubation is suggested to prevent desaturation from apnea during the intubation attempt. Preoxygenation can be performed using noninvasive positive pressure ventilation (NIPPV), oxygen by face mask, or high-flow nasal oxygen.

G-TRUST SCORECARD

Score	Criteria
Yes	Focus on patient-oriented outcomes
Yes	Clear and actionable recommendations
Yes	Relevant patient populations and conditions
Yes	Based on systematic review
Yes	Evidence graded by quality
Yes	Separate evidence review or analyst in guideline team
Yes	Chair and majority free of conflicts of interest
No	Development group includes most relevant specialties, patients, and payers
	Overall – useful

Note: See related editorial, Where Clinical Practice Guidelines Go Wrong, at https://www.aafp.org/afp/gtrust.html.

G-TRUST = guideline trustworthiness, relevance, and utility scoring tool.

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Based on low-quality evidence, using high-flow nasal oxygen for preoxygenation when laryngoscopy is expected to be challenging may be more beneficial than using oxygen by face mask. Limited evidence suggests that using high-flow nasal oxygen reduces desaturations without increasing aspirations. Unlike face mask or NIPPV, high-flow nasal oxygen can be used for preoxygenation throughout intubation attempts.

With severe hypoxemia, a ratio of partial pressure of oxygen to fraction of inspired oxygen concentration less than 200, NIPPV is suggested because preoxygenation with high-flow nasal oxygen may lead to increased desaturation risk.

If patients cannot tolerate preoxygenation due to confusion, using ketamine is suggested for sedation during preoxygenation based on very low-quality evidence. Using sedation during preoxygenation is sometimes referred to as delayed sequence intubation. A fixed infusion dose of 1.5 mg/kg or titrating up from an initial dose of 1.0 mg/kg to reach the goal of dissociation is recommended.

INDUCTION AGENTS

The guidelines suggest etomidate (Amidate), ketamine, midazolam, or propofol (Diprivan) for induction before rapid sequence intubation. Although one meta-analysis suggests slightly higher mortality when using etomidate compared with ketamine, there is no difference when considering only randomized controlled trials.

NEUROMUSCULAR BLOCKING AGENTS

Although some physicians choose to avoid paralysis to prevent the risk of inability to intubate and inability to ventilate, the guideline strongly recommends using neuromuscular blocking agents despite the low quality of evidence. Using these agents reduces vomiting and aspiration risk during intubation. Administering succinylcholine or rocuronium before intubation is suggested to paralyze a sedated patient. Even though intubation success rates vary, the most robust study demonstrated first-pass intubation in 81% of patients with paralysis compared with 70% without paralysis and higher first-pass success if a paralytic agent is used.

Editor's Note: The importance of this guideline may be that so few family physicians perform intubations regularly but may be put in the position of having to intubate an unstable patient. This guideline contains some important points that are new to me, especially the use of high-flow nasal cannula for preoxygenation before intubating, which reduces desaturations and can be used throughout the intubation process.

Despite low-quality evidence overall, the one strong recommendation is to use neuromuscular blocking agents to paralyze. Despite their recommendation that paralysis be applied in most patients based on high confidence of the group, I find it reassuring that intubation success is only slightly lower if these agents are not available or if I worry about the risks of using them and then having a failed intubation. The other suggestions are conditional recommendations based on the opinion that the benefit outweighs the risk.

—Michael J. Arnold, MD, MHPE, Assistant Medical Editor

The views expressed are those of the authors and do not necessarily reflect the official policy or position of the Naval Undersea Medical Institute, Uniformed Services University of the Health Sciences, US Navy, US Department of Defense, or US government.

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