AARC clinical practice guidelines: artificial airway suctioning.

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American Association for Respiratory Care (AARC)

Blakeman TC, Scott JB, Yoder MA, et al. AARC clinical practice guidelines: artificial airway suctioning. Respir Care. 2022 Feb;67(2):258-271. [105 references] PubMed

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Overview

Guideline Objective

To address questions related to the indications, complications, timing, duration, and methods of artificial airway suctioning

Patient Population

Neonatal, pediatric, and adult patients with artificial airways

Recommendations

Recommendation Statements

Population Intervention Comparator Outcome (PICO) Question 1: What are the indications for and complications of

artificial airway suctioning in the neonatal, pediatric, and adult population?

Breath sounds, visual secretions in the artificial airway, and a saw-tooth pattern on the mechanical ventilation waveform provide the best indications for endotracheal suctioning in the adult and pediatric population. (**Evidence level B; all the committee members rated the appropriateness score at 8**)

An acute increase in airway resistance may be an indicator for the need for artificial airway suctioning in neonates. (**Evidence level B; median appropriateness score 7, range 7–8**)

Mitigation strategies such as adequate sedation, preoxygenation, and suctioning only if indicated may reduce the incidence and severity of potential complications, including but not limited to increased heart rate, mean arterial pressure, intracranial pressure (ICP), cardiac arrythmias, and oxygen desaturation. (**Evidence level B; median appropriateness score 7.6, range 7–9**)

PICO Question 2: Should artificial airway suctioning be performed on a schedule or only on an as-needed basis?

As-needed suctioning is just as effective as routine suctioning and does not increase morbidity or mortality in neonatal and pediatric populations. (**Evidence level B; all the committee members rated the appropriateness score at 8**)

PICO Question 3: Should artificial airway suctioning be performed by using open or closed systems?

Either the closed suction system or the open suction system can be used safely and effectively to remove secretions from the adult patient with an artificial airway. (**Evidence level B; median appropriateness score 8.3, range 7–9**)

PICO Question 4: Should patients receive preoxygenation and/or hyperoxygenation before suctioning every time?

Adult and pediatric patients should be preoxygenated before artificial airway suctioning. (**Evidence level B; all the committee members rated the appropriateness score at 9**)

PICO Question 5: Should normal saline solution lavage be used during suctioning of the artificial airway?

The routine use of normal saline solution (generally should be avoided) is unnecessary during artificial airway suctioning. (**Evidence level B; median appropriateness score 8.85, range 8–9**)

PICO Question 6: Should open suctioning of an artificial airway be performed as a clean procedure or as a sterile procedure?

The clinician should use a sterile procedure for open suctioning events to protect the patient from potential cross-contamination. (**Evidence level C; all the committee members rated the appropriateness score at 7**)

PICO Question 7: What size suction catheter and what vacuum pressure should clinicians use to suction artificial airways?

Suction catheters should occlude <70% of the endotracheal tube (ETT) lumen in infants, children, and adults. (**Evidence level C; all the committee members rated the appropriateness score at 7**)

Suction pressures should be kept below –200 mm Hg in adults and below –120 mm Hg in the neonatal and pediatric population. (**Evidence level C; all the committee members rated the appropriateness score at 7**)

Efforts to set the suction pressure as low as possible and effectively clear secretions should be made. (**Evidence level C; all the committee members rated the appropriateness score at 9**)

PICO Question 8: What limit should be imposed on the duration of the suctioning event?

The clinician should keep the suctioning procedure as brief as possible and no longer than 15 seconds. (**Evidence level C; all the committee members rated the appropriateness score at 9**)

PICO Question 9: Is a shallow suctioning technique preferred over a deep suctioning technique?

A shallow suctioning technique should be used routinely. (**Evidence level B; median appropriateness score 7.7, range 7–8**)

Deep suctioning should generally be used only when shallow suctioning is ineffective with consideration of the potential for airway trauma and the negative impact on physiologic indices. (**Evidence level B; median appropriateness score 7.2, range 7–8**)

PICO Question 10: When should bronchoscopy be used in lieu of open or closed suctioning techniques?

Routine use of bronchoscopy for secretion removal is not recommended. (**Evidence level C; all the committee members rated the appropriateness score at 9**)

PICO Question 11: When should tube scraping devices be used in addition to suction catheters?

There is evidence that supports the use of devices use to clear ETTs when an increase in airway resistance (R_{aw}) are suspected due to secretion accumulation. (**Evidence level B; median appropriateness score 8.5, range 8–9**)

Evidence Rating Scheme

Level of Evidence Supporting the Recommendation

- **A**: Convincing scientific evidence based on randomized controlled trials of sufficient rigor
- **B**: Weaker scientific evidence based on lower levels of evidence, such as cohort studies, retrospective studies, case-control studies, and cross-sectional studies
- **C**: Based on the collective experience of the committee

Recommendation Rating Scheme

It is recognized that a process is necessary to combine the best available evidence with the collective experience of the committee members. To achieve this, a modification of the RAND/UCLA appropriateness method was used.

Committee members reviewed the first draft of evidence tables, systematic reviews, recommendations, and evidence levels. Each committee member rated each recommendation by using a Likert scale of 1 to 9, with 1 meaning that expected harms greatly outweigh the expected benefits and 9 meaning that expected benefits greatly outweigh the expected harms. After discussing each PICO question, committee members again rated each recommendation. The final median and range of committee members' scores are reported.

Strong agreement required that all the committee members rank the recommendation ≥ 7, weak agreement meant that one or more committee members ranked the recommendation < 7, but the median vote was at least 7. For recommendations with weak agreement, the percentage of committee members who rated ≥ 7 was calculated and reported after each weak recommendation.

Related Content

Supporting Documents

- Supplementary Table 1. Summary of Evidence for Each PICO Question Included in the Systematic Review; 2022 Feb.
- Appendix A. Search Strategies by Database.
- Appendix B. Included Literature.

Implementation Tools

No implementation tools available.

Patient Education

No patient education materials available.

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TRUST Scorecard

Composition of Guideline Development Group (GDG)

Multidisciplinary GDG Members	**Yes**
Methodologist Involvement	**No**
Incorporation of Patient and Public Perspective	

Systematic Review of Evidence

Literature Search	
Study Selection	
Evidence Synthesis	

Foundations for Recommendations

Strength of Evidence Grade	
Description of Benefits and Harms of Recommendations	
Summary of Evidence Supporting Recommendations	
Strength of Recommendations Rating	
Clear Articulation of Recommendations	

Funding Source

No

Disclosure and Management of Financial Conflicts of Interests



External Review



Updating



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