**Clinical question.**

In adult cardiac arrest (prehospital [OHCA], in-hospital [IHCA]) (P), does the use of oropharyngeal airway or nasopharyngeal airway adjuncts (I) compared with no airway adjuncts (C), improve any outcomes (eg. ventilation, oxygenation) (O)?

**Is this question addressing an intervention/therapy, prognosis or diagnosis?** Intervention/therapy

**State if this is a proposed new topic or revision of existing worksheet: New**

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**Conflict of interest specific to this question**

Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No

**Search strategy (including electronic databases searched).**

Searched PubMed "oropharyngeal airway", "nasopharyngeal airway", "nasopharyngeal airway and cardiac arrest", "oropharyngeal airway and cardiac arrest", "cardiac arrest airway adjuncts", "cardiac arrest and oropharyngeal airway and ventilation and oxygenation", "cardiac arrest airway", “heart arrest and oropharyngeal airway”, “heart arrest and nasopharyngeal airway”, “cardiac arrest and guedel airway” and “heart arrest and guedel airway”. The most comprehensive terms/MESH headings were "oropharyngeal airway" which resulted in 1487 citations and "nasopharyngeal airway" which resulted in 1102 citations. By reviewing the titles for all of these citations, any article with possible relevance was examined further. The authors identified 106 oropharyngeal airway and 52 nasopharyngeal airway articles for which abstracts/manuscripts were read and final articles were selected based on relevance to the assigned clinical question. Embase was searched using "oropharyngeal airway and cardiac arrest" resulted in 4 citations and "nasopharyngeal airway and cardiac arrest" resulted in 9 citations. Cochrane database was searched using "oropharyngeal airway" resulted in 3 citations and "nasopharyngeal airway" resulted in 3 citations. No articles from Embase or Cochrane database were relevant to the clinical question and therefore not included.

**State inclusion and exclusion criteria**

Because of limited relevant citations, all articles were reviewed in hopes that in the final phase some would prove useful.

**Number of articles/sources meeting criteria for further review: 15**

There were no articles that directly studied this clinical question. Although no articles addressed airway adjuncts in cardiopulmonary arrest in humans, in order to make this worksheet valuable, we reviewed thousands of citations to find any that were remotely related to the topic.
# Summary of evidence

## Evidence Supporting Clinical Question

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<th>Koga 2001 E</th>
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<td>Rechner 2007 E</td>
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<td>Level of evidence</td>
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A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Other endpoint  
*Italics = Animal studies*
## Evidence Neutral to Clinical question

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<td>Poor</td>
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**Level of evidence**

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C = Survival to hospital discharge  
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E = Other endpoint

Italics = Animal studies

## Evidence Opposing Clinical Question

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**Level of evidence**

A = Return of spontaneous circulation  
B = Survival of event  
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D = Intact neurological survival  
E = Other endpoint

Italics = Animal studies
REVIEWER'S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:

No articles examined the use of airway adjuncts (nasopharyngeal airway or oropharyngeal airway) in adult patients with cardiopulmonary arrest. As stated previously, we did identify 15 articles that warranted further review. All 15 were only Level of Evidence (LOE) 5 studies. Fourteen of the 15 studies were considered LOE 5 because they did not examine cardiac arrest and the final study of the 15 which did examine cardiac arrest qualified as LOE 5 because it was an animal study. Of these 15 articles, five supported the clinical question, two were neutral and eight opposed the clinical question. Of the five articles that supported the clinical question, two were categorized as studies with good evidence. In the article by Koga et al, when a Guedel-type airway (oropharyngeal airway) was inserted, the tidal volumes through a face mask were significantly greater than when no airway device was used ($V_T = 12.3 \pm 4.5$, 95% CI 10.6 to 14 mL/kg vs $V_T = 8.5 \pm 4.5$, 95% CI 6.8 to 10.2 mL/kg; $p<0.001$). In the article by Fukui et al, 20 adult rats were randomly assigned to receive oropharyngeal airway vs no oropharyngeal airway in cardiac arrest. Animals with oropharyngeal airways had significantly higher arterial oxygen saturations than those animals without an airway (77 ± 19% vs 55 ± 25%, $p<0.05$). Therefore, insertion of an oropharyngeal airway increased oxygenation in cardiac arrest. Of the 5 articles that showed evidence supporting the clinical question, two were classified as fair studies. In the article by Rechner et al, 60 children undergoing anesthesia for elective surgery were evaluated to see whether nurses could achieve better ventilation with a laryngeal mask airway vs facemask with oropharyngeal airway. In this study, no difference in ventilation between the two groups were seen, however, ventilation was achieved more quickly in the group with facemask and oropharyngeal airway (39 seconds compared to 25 seconds, $p<0.001$). In the article by Chhajed et al, 20 lung transplant patients had insertion of a nasopharyngeal tube (NT) if there oxygen saturations ≤ 90% during an elective bronchoscopy. In the same group of patients, prophylactic insertion of NT was done on future bronchoscopies and this prevented acute hypoxemia in the majority of lung transplant patients (95% of patients which has previously desaturated did not have this occur when NT was inserted prophylactically). The final of the 5 articles that showed evidence supporting the clinical questions was classified as a poor study. In this article by Roberts et al, a review of 494 abstracts of nasopharyngeal airways was examined. It concluded that methods of safe placement should receive more attention than fear of complications due to the finding that risk of complications was rare (2 single case reports). Of the 15 total studies identified for review, two showed evidence neutral to the clinical question. In the article by Tong and Smith, 24 patients requiring nasotracheal intubation for elective maxillofacial surgery were prospectively randomized to receive oropharyngeal airway or nasopharyngeal airway and examined the effects on blood pressure and heart rate. This study found that insertion of a nasopharyngeal airway had a significantly greater blood pressure response than that following insertion of an oropharyngeal airway but did not exceed pre-induction level blood pressures. In the study by Holm-Knudsen et al, this was an observational study in children with suspected or known difficult airways that got fiberoptic-guided intubations. Anesthesiologists observed that placing a nasopharyngeal airway in the other nostril prior to fiberoptic intubation allowed the patient to have a patent airway and sufficient oxygenation until intubation occurred. Of the 15 articles, 8 had poor evidence opposing the clinical question. Seven of the 8 articles were single case presentations of a complication. Three of these studies (Muzzi et al, Martin et al and Schade et al) presented cases of intracranial insertion of a nasopharyngeal airway in patients with craniofacial trauma. The article by Scott and Gray reported the case of injury to a nasal turbinate by insertion of a nasopharyngeal airway. The article by Kok et al reported the case of a fractured tooth from placement of an oropharyngeal airway. The study by Wang et al reported the case of a lingual nerve injury in a patient that received an oropharyngeal airway during elective surgery. The study by Lee et al reported the case of aspiration of an oropharyngeal airway into the hypopharynx during
nasotracheal intubation. The last article by Stoneham was a prospective study in 120 anesthetized patients and identified improper nasopharyngeal airway placement in 73% of patients and clinical evidence of airway obstruction was present in 42% of patients. Risks of airway adjuncts are related to improper positioning of the devices. When used properly, there is minimal evidence in the literature to show benefit for the use of these airway adjuncts compared to no adjunct utilization.

Acknowledgements: Dr. Peberdy

Citation List


LOE 5, Fair, Support: Prophylactic placement of nasopharyngeal tube prevented acute hypoxaemia in lung transplant patients. Study does not have a comparison group with no airway adjunct intervention.


LOE 5, Good, Support: 20 adult rats randomly assigned to oropharyngeal airway vs no oropharyngeal airway; this is the only study that addressed cardiac arrest. Insertion of oropharyngeal airway increased oxygenation.


LOE 5, Poor, Neutral: Nasopharyngeal adjunct airway assisted nasotracheal intubation for small children with difficult airways.


LOE 5, Good, Support: This was a prospective randomized study comparing oropharyngeal airway, cuffed oropharyngeal airway (COPA), and no airway device. Ventilation was greater in patients with oropharyngeal airway compared to no airway device.


LOE 5, Poor, Opposing: Case study complication of oropharyngeal way—fractured tooth.

**LOE 5, Poor, Opposing:** Case study complication of oropharyngeal airway—aspiration.


**LOE 5, Poor, Opposing:** Case study complication of oropharyngeal airway—intracranial insertion.


**LOE 5, Poor, Opposing:** Case study complication of nasopharyngeal airway—insertion into cranial fossa.


**LOE 5, Fair, Support:** Oropharyngeal airway compared to laryngeal mask airway had similar ventilation outcomes.


**LOE 5, Poor, Support:** Review article minimizes complications related to nasopharyngeal airways as an adjunct device.


**LOE 5, Poor, Opposing:** Case study of complications of nasopharyngeal airway—insertion into cranial fossa.


**LOE 5, Poor, Opposing:** Case study of complication related to nasopharyngeal airway—middle turbinate avulsion.

**LOE 5, Poor, Opposing:** Nasopharyngeal airway compression as a common cause of respiratory obstruction.


**LOE 5, Poor, Neutral:** 24 patients requiring nasotracheal intubation randomly received nasopharyngeal or oropharyngeal airways. No significant pressor response was noted.


**LOE 5, Poor, Opposing:** Case study of complication of oropharyngeal airway—lingual nerve injury.