The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

I Evidence obtained from a systematic review of all relevant randomised control trials.

II Evidence obtained from at least one well designed randomised control trial.

III Evidence obtained from well-designed controlled trials without randomisation.

IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series

V Evidence obtained from systematic reviews of descriptive and qualitative studies

VI Evidence obtained from single descriptive and qualitative studies

VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). Evidence-based practice in nursing & healthcare: A guide to best practice (2nd ed.). Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.

National Health and Medical Research Council (2009). NHMRC levels of evidence and grades for recommendations for developers of guidelines (2009). Australian Government: NHMRC. http://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/evidence_statement_form.pdf

OCEBM Levels of Evidence Working Group Oxford (2011).The Oxford 2011 Levels of Evidence. Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=1025

Databases searched:	☐ CINAHL (Ebsco)	☐ Medline (Ebsco)	☐ Pubmed (NLM)	☐ Nursing (Ovid)	☐ Emcare (Ovid)	☐ Other List: _____
Keywords used:	Nasopharynx, intubation, newborn, baby, neonate, toddler, preschooler, kinder-aged, boy, girl, children, paediatric, school-age, schoolchild/boy/girl, adolescent, youth(s), teenager, suction, postoperative complications, airway obstruction/obstructed-airway, staff training					
Search limits:	English only					
Other search comments:						

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Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
Parhizkar N., Saltzman B., Grote K., Starr J., Cunningham M., Perkins J., et al (2011). Nasopharyngeal airway for management of airway obstruction in infants with micrognathia. Cleft Palate-Craniofacial Journal, 48(4), 478-482. https://doi.org/10.1597/09-263	IV	NPA use in infants with micrognathia, secondary cleft palate, branchial arch anomalies, Pierre Robin sequence (PRS), or velocardiofacial syndrome.
COte A., Fanous A., Almajed A. & Lacroix Y. (2015). Pierre Robin sequence: Review of diagnostic and treatment challenges. International Journal of Pediatric Otorhinolaryngology, 79(4), 451-464. https://doi.org/10.1016/j.ijporl.2015.01.035	VII	NPA can solve significant amount of airway obstruction, is a temporary measure. Suitable for PRS management.
Kouga T., Tanoue K. & Matsui K. (2014). Airway statuses and nasopharyngeal airway use for airway obstruction in syndromic craniosynostosis. The Journal of craniofacial surgery, 25(3), 762-765. https://doi.org/10.1097/SCS.0000000000000763	IV	(NPA) strategy has been reported as a first-line intervention for airway obstruction that is effective and reduces the severity of obstruction, and is well tolerated by both patients and caregivers and may obviate the need for tracheotomy
Wagener S., Rayatt S.S., Tatman A.J., Gornall P. & Slator R. (2003). Management of infants with Pierre Robin sequence. Cleft Palate-Craniofacial Journal, 40(2), 180-185. https://doi.org/10.1597/1545-1569%282003%29040%3C0180:MOIWPR%3E2.0.CO;2	IV	Relieving airway obstruction by NPA is an effective and safe treatment for babies with PRS until they have grown out of their respiratory and feeding difficulties. It avoids the need for surgery and can be used on neonatal wards
Bensoussan Y., Wolter N.E., Peer S., Alemu R.Z., Roy M. & Propst E.J. (2019). Pediatric nasopharyngeal airways expand when exposed to saline. International Journal of Pediatric Otorhinolaryngology, 126, no pagination. https://doi.org/10.1016/j.ijporl.2019.109595	VII	NPA measuring guide. ?Normal Saline may increase size of NPA over 5-15 days, therefore Patients with NPA should be monitored closely for airway obstruction, patency should be verified regularly and new tubes should be placed frequently.

Blanc, F., Harrewijn, I., Duflos, C., Maggiulli, F., & Captier, G. (2021). Nasopharyngeal Tube and Functional Treatment in Pierre Robin Sequence: A Tertiary Clinical Experience From 150 Cases. *The Cleft Palate-Craniofacial Journal*, 1-8. https://doi.org/10.1177/10556656211031105	IV	Nasopharyngeal airway tube as first line major treatment to relieve upper airway obstruction without surgery required for most children with PRS, with and without respiratory management, respiratory distress symptoms and children requiring nasopharyngeal tube (NT) or non-conservative surgical treatment.
Anderson, K. D., Cole, A., Chuo, C. B., Slator, R. (2007). Home management of upper airway obstruction in pierre robin sequence using a nasopharyngeal airway. Cleft Palate-Craniofacial Journal, 44, 269-73.	IV	This unit has reported management of infants with Pierre Robin Sequence (PRS) and upper airway obstruction using nasopharyngeal airways and nutritional support until enough growth takes place for the infant to thrive. Long in-patient stay of infants with Pierre Robin Sequence (PRS) and upper airway obstruction using nasopharyngeal airways and nutritional support prompted review of Birmingham Children's Hospital management protocols and consideration of treatment at home. A revised management protocol reduced in-patient stays, with infants continuing to thrive after discharge home, and furthermore a low complication rate.
Boku, A., Hanamoto, H., Hirose, Y., Kudo, C., Morimoto, Y., Sugimura, M., Niwa, H. (2014). Which nostril should be used for nasotracheal intubation: the right or left? a randomized clinical trial. Journal of Clinical Anesthesia, 26, 390-4. https://dx.doi.org/10.1016/j.jclinane.2014.01.016	II	Nasal intubation via the right nostril is more safely performed than with the left nostril. Because of less epistaxis and faster intubation. Epistaxis was inspected in the pharynx after the tube tip was passed through the nasal cavity and 15 minutes after nasotracheal intubation was completed. (though this article refers to nasal intubation and not NPA insertion, findings could potentially be useful when inserting an NPA).
van Lieshout, M. J., Joosten, K. F., Mathijssen, I. M., Koudstaal, M. J., Hoeve, H. L., van der Schroeff, M. P., Wolvius, E. B. (2015). Robin sequence: a european survey on current practice patterns. Journal of Cranio-Maxillo-Facial Surgery, 43, 1626-31. https://dx.doi.org/10.1016/j.jcms.2015.07.008	IV	Au survey of European countries found treatment of airway obstruction in patients with Robin Sequence differed considerably between different countries. Prone positioning for mild airway obstruction was the treatment modality used most often (63%). When prone positioning was not successful, a nasopharyngeal airway was used (62%). Surgical therapies varied considerably among countries. For severe obstruction, mandibular distraction was performed most frequently.

Abel, F., Bajaj, Y., Wyatt, M., Wallis, C. (2012). The successful use of the nasopharyngeal airway in pierre robin sequence: an 11-year experience. Archives of Disease in Childhood, 97, 331-4. https://dx.doi.org/10.1136/archdischild-2011-301134	IV evaluation	In most children (86.5%) with PRS, airway obstruction was managed by conservative measures or with an NPA for a few months.
Wiechers, C., Thjen, T., Koos, B., Reinert, S., Poets, C. F. (2021). Treatment of infants with craniofacial malformations. Archives of Disease in Childhood Fetal & Neonatal Edition, 106, 104-109. https://dx.doi.org/10.1136/archdischild-2019-317890	VII review	The prevalence of respiratory problems in patients with craniofacial malformations (CFM) reaches 60%–100% and is not limited to syndromic CFM; also infants with isolated cleft lip/palate have an increased risk of breathing difficulties. NPA's have been used for over 30 years in RS infants. In a retrospective evaluation, more than 80% of RS patients with moderate to severe airway obstruction were reported successfully treated with an NPA.

Johnson, M., Miskovic, A., Ray, S., Chong, K., Hickson, M., Bingham, B., Skellett, S. (2019). The nasopharyngeal airway: estimation of the nares-to-mandible and nares-to-tragus distance in young children to assess current clinical practice. Resuscitation, 140, 50-54. https://dx.doi.org/10.1016/j.resuscitation.2019.04.039	III	In paediatric resuscitation upper airway obstruction is common. A nasopharyngeal airway (NPA) is a simple, practical device used to relieve upper airway obstruction by separating the soft palate from the oropharynx. The ideal position of the NPA is considered to be that the distal tip should protrude beyond the pharyngeal end of the soft palate but should not pass more distally than the epiglottis. Estimating the length of insertion is based on external anatomical methods, which differ between guidelines. European Resuscitation Council (ERC), [3] and the Advanced Life Support Group (ALSG) [4] recommend that an NPA be inserted as part of basic airway management in a child with airway obstruction. The ability of the NPA to maintain airway patency is critically dependent on both the internal diameter of the airway, and the position of the distal tip of the NPA. [1] The ideal position of the NPA is considered to be that the distal tip should protrude beyond the pharyngeal end of the soft palate but should not pass more distally than the epiglottis. ERC recommend sizing by measuring the length from the nostril and the angle of the jaw. RC and ALSG recommend measuring from the length from the nostril to the tragus of the ear. It is vital for the NPA to be sized correctly; if it is too short it will fail to separate the soft palate from the pharynx, if it is too long, it can come into the larynx and aggravate the cough and gag reflexes. The ideal position in adults and paediatrics is for the distal tip of the NPA to sit 10 mm above the epiglottis. This allows for movement of the airway relative to laryngeal structures with flexion and extension of the head, without aggravating the gag reflex from epiglottic contact. Widely taught methods of sizing have limited evidence in adult population and even less in the paediatric population. In infants under 12-months old a close relationship has been described between nares-vocal cord distance and nose tip-earlobe distance.

		Length of a nasopharyngeal airway in children under the age of twelve years can be predicted using the nares-tragus external anatomical distance minus 10 mm. There should always be awareness of the risk of respiratory obstruction even with an airway in place.
Fung, E., Cave, D., Witmans, M., Gan, K., El-Hakim, H. (2010). Postoperative respiratory complications and recovery in obese children following adenotonsillectomy for sleep-disordered breathing: a case-control study. Otolaryngology - Head & Neck Surgery, 142, 898-905. https://dx.doi.org/10.1016/j.otohns.2010.02.012		Upper airway obstruction is a major cause of morbidity in children with syndromic craniosynostosis. The first-line use of an NPA is effective and reduces the severity of obstruction in these children. It is well tolerated by both the patient and caregiver and may obviate the need for tracheostomy.