Pediatric Anatomical Variations and their Implications on the Difficulty of Nasotracheal Intubation

MASTER’S THESIS

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By

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Abstract

**Purpose:** The purpose of this study was to identify factors that lead to a difficult nasotracheal intubation in pediatric patients undergoing general anesthesia for dental procedures.

**Methods:** Ninety-nine, ASA I or II, were scheduled for elective dental surgery and randomly assigned to undergo nasotracheal intubation. Three CRNA’s were selected to reduce operator variability and preoperative assessment was completed by the attending physician anesthesiologist using a form specific to this study, over viewing the patient’s medical history and anatomical features. Epistaxis was rated as none, mild, moderate, severe. The amount of blood was visualized in the posterior oropharynx during DL before the chosen ET tube is passed through the vocal cords for successful intubation. The number of intubation attempts, amount of blood and number of times a new tube was chosen was recorded by the CRNA.

**Results:** There were 4 variables that were statistically significant for correlation with multiple intubation attempts. They were soft tissue profile, naris used, cricoid pressure used and epistaxis severity. Also, there were 2 variables which correlated statistically with epistaxis severity. They were age of patient and maximum incisal opening.

**Conclusions:** There appears to be a relationship between the concave facial profile of a patient and how difficult it is to nasally intubate such a patient. Also moderate and severe epistaxis complicates NT intubation particularly after multiple intubation attempts, although none of the patients in this study had a difficult airway by the definition. Our results indicate that older male children with a concave profile would be more difficult to intubate.
Dedication

This document is dedicated to my family and friends
Acknowledgments

I would like to thank my committee for their time, guidance and support in making this project a success. I would also like to thank the CRNA’s, Melissa Emerson, Brian Hall and Rachel Boone for all their efforts in assisting with this project.
Vita

May 2000 ........................................ Bryan High School, Bryan OH

May 2004 ........................................... B.A. Psychology, Miami University of Ohio

June 2011 ........................................... D.D.S. The Ohio State University

June 2011 to June 2012 ......................... Oral Surgery Internship Certificate,

University of Maryland

June 2012 to present ............................ Dental Resident, Department of Pediatric

Dentistry, The Ohio State University

Fields of Study

Major Field: Dentistry
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Chapter 1: Introduction

Managing the airway is a fundamental skill in the practice of anesthesia and is one of the most important responsibilities of an anesthesiologist. Intubation is one way to ensure oxygenation and ventilation of the patient. Airway assessment is done prior to the administration of a general anesthetic to identify and predict a difficult intubation. Present day examination and analysis of the airway for orotracheal intubations include assessments of the following to help identify a difficult airway: assessing soft tissue profile, determining the maximal oral (or interincisal) opening, observing the Malampati score and measuring the mandibular length, or more commonly, the thyromental distance. These exams have typically led to a descriptive interpretation to predict intubation difficulty. Poor airway management due to inadequate documentation or less than adequate preoperative assessment is a serious patient safety concern. Routine and thorough preoperative airway exam is always expected in an attempt to characterize the airway to provide a good view of the larynx. Standard airway assessment tests have their shortcomings, including low sensitivity/specificity, positive and negative predictive values, large inter-observer variability, and the inability to routinely and easily evaluate base-of-the-tongue pathology on an awake patient. As a result, reliance on the above mentioned tests may, in one practitioner’s hands lead to an over prediction of airway difficulty but
used by a second practitioner may not be sensitive enough to detect a difficult airway (DA). Current day airway assessments remain variable and objective, and their predictive value controversial.\textsuperscript{[5]}

Practitioners of anesthesiology are trained in various techniques to achieve a successful tracheal intubation. Intubation of the trachea via the mouth remains the more common method for most surgical procedures, however surgical procedures in the oral cavity often require nasotracheal intubation (NTI) to facilitate surgical access. Using this anatomical path presents, inherently, a greater potential for trauma than with orotracheal intubation (OTI) as a result of the narrow nasal passages and fine bony surrounding anatomy (e.g. turbinates).\textsuperscript{[7]} For many anesthetists who do not perform nasal intubations routinely, the technique can also be more challenging than the more standard oral approach.

NTI, when compared to OTI, offers surgeons who operate in the oral cavity some major advantages. These include improved surgical access, improved view of the treatment area and the ability to evaluate and treat the patient’s dental occlusion.\textsuperscript{[8]} Specifically, NTI offers surgeons unimpeded access to the oral cavity and maxillofacial complex, free movement of the facial bones during orthognathic surgery, and reduction of facial fractures. It permits correct articulation between the mandible and maxilla during surgical procedures. These advantages are offset by some additional complications associated with NTI, one of the major and more common ones being epistaxis (nose bleeds). Additional common complications of NTI include mucosal abrasion and a post-operative sore throat of short duration. Rare
potential complications found described in the literature include retropharyngeal perforation, traumatic tissue avulsion, lacerations of nasal and pharyngeal structures, infections subsequent to mucosal trauma, glottic edema, tracheal stenosis, vocal cord palsy, and arytenoid cartilage dislocation.\[^{6, 8, 16}\] The most common of all complications of nasotracheal intubation is abrasion of the nasal mucosa as the tube is passed posteriorly, and frequently is associated with mild epistaxis. Although several recommendations have been made to reduce the incidence of this complication, including the immediate local application of vasoconstricting drugs, thermo-softening of the tube, and use of a nasopharyngeal airway as a pathfinder, the problem cannot be avoided entirely.\[^{1, 7, 9, 11, 14, 17, 18}\] In prospective series, the incidence of bleeding is high, ranging from 18 to 77%, even in experienced hands.\[^{16}\] The intermediate step in NTI, usually performed blindly as the nasoendotracheal tube is passed from the naris to the nasopharynx, is particularly traumatizing. Bleeding from this area usually occurs following damage to Kisselbach’s plexus, a region in the anterior part of the nasal septum. The main blood supply to the nasal cavity is derived from the sphenopalatine artery, a continuation of the maxillary artery and this plexus is the result of an anastomosis between the superior labial and ascending branch of the greater palatine artery.\[^{8}\] This vascular and rather exposed area of mucosa is known as Little’s area. It is important to note, however, that the nasal mucosa remains well vascularized throughout the nasal cavity, such that trauma to any area can result in brisk bleeding.\[^{8}\] As one might expect, epistaxis is more likely to occur with the use of a larger endotracheal tube, and excessive force, or following repeated unsuccessful attempts.\[^{8, 16}\] If bleeding does occur on insertion of the tube, it is suggested that
Intubation should be completed, provided it can be accomplished quickly. It is believed that the tube tamponades the bleeding as well as protects the airway. If tracheal intubation is not satisfactorily achieved in this time, and there is brisk bleeding, the tube may be withdrawn so that the balloon can be positioned in the posterior nasal space, where it can be inflated to prevent blood passing into the oropharynx while at the same time acting as a nasopharyngeal airway. \textsuperscript{12}

The incidence of bleeding following NTI reported in the literature is variable. \textsuperscript{16, 8} Tintinalli & Claffey reviewed 71 NTI’s carried out by inexperienced practitioners, under supervision, in an emergency setting. They demonstrated a hemorrhage rate of 17\%. Numerous strategies have been used to prevent epistaxis which include determining which naris is more patent, thermosoftening the tube, determining the best pathway through the nose, topical vasoconstrictor use, and using adjuncts/other materials to help guide the NT tube. \textsuperscript{1, 7, 9, 11, 14, 17, 18} A better solution may be finding a predictor of which patients might have a higher likelihood of bleeding and thus anticipate epistaxis and its complication of intubations.
The American Society of Anesthesiologists (ASA) Task Force on Difficult Airway Management defines a difficult airway as “the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation, or both.” Incidence of a difficult airway for intubation when the patient is easy to mask ventilate is 8% and is 3-4x higher in situations where the patient is difficult or impossible to mask ventilate. \cite{4, 13, 15} It should be noted that most of the literature focuses on adults rather than children.

Differences between the pediatric and adult airway include \cite{4}:

- The pediatric airway is smaller in diameter and shorter in length than the adult’s.
- The young child's tongue is relatively larger in the oropharynx than the adult’s.
- The larynx in infants and young children is located more anteriorly compared with the adult’s.
• The epiglottis in infants and young children is relatively long, floppy, and narrow.
• In children younger than 10 years of age, the narrowest portion of the airway is below the glottis at the level of the cricoid cartilage.

Most of the literature on managing difficult airways surrounds orotracheal intubation and preoperative assessments.

To avoid morbidity and mortality, in situations when it is anticipated that securing the airway will be difficult, it is crucial to have a planned approach, and many guidelines have been developed by national societies focusing on this very topic in the unconscious adult patient. However little guidance appears in the literature on how best to approach the pediatric patient with an anticipated difficult airway. Previously published predictors of difficult direct laryngoscopy are widely known. The difficult airway is an important contributor to both patient morbidity and mortality. It is important to have a planned management approach available for the anticipated and, more importantly, the unanticipated difficult airway.

This study aims to investigate a range of potential factors and to determine the extent of such a relationship. Preoperative evaluation of a patient’s anatomical features is a routine undertaking, and a better understanding of common variations and their influence on intubation outcomes would aid in the clinical decision making of daily anesthesiology practice.
Chapter 2: Methods

After institutional review board approval from Nationwide Children’s Hospital in Columbus OH, 99 healthy children, ASA I or II, who were scheduled for elective dental surgery under general anesthesia with nasotracheal intubation were enrolled in this prospective study. The data was collected from January 2014 through May 2014 in the dental surgery center attached to the Outpatient Dental clinics at Nationwide Children’s Hospital. 99 subjects were enrolled in the study, the only exclusion criteria being that they were at least 2 years of age and no older than 18 years of age. The IRB at Nationwide Children’s Hospital allowed for waiver of consent by parents due to the minimal risk that our protocol for intubation created.

Preoperative patient assessment was guided by the use of a form designed specifically for this study and conducted by one attending physician anesthesiologist to reduce examining bias and variability. (Appendix, Form 1). The intraoperative care of patients in this study was provided by 3 CRNA’s only. Each practitioner was calibrated for the study as an attempt to further reduce inter-operator variability. The patient was placed in a supine position and standard ASA monitors applied. General anesthesia was induced using a combination of two of the most commonly used induction agents of today, sevoflurane and propofol. Initially an inhaled gaseous mixture of 50% N2O and O2 was delivered to the patient for anxiolysis and then
sevoflurane was slowly titrated to 8%, as hemodynamically tolerated, until loss of consciousness. Intravenous access was established and propofol 2mg/kg administered as a slow bolus. Ventilation continued with 100% oxygen and 8% sevoflurane for 1 minute prior to intubation. An appropriate sized endotracheal tube was selected for the patient guided primarily by age using the commonly described formula, “((Age of patient + 4)/4) = diameter of tube in millimeters”. Following induction, the chosen endotracheal tube was lubricated and inserted into the right naris at room temperature. If the endotracheal tube met resistance a second tube, one half size smaller, was taken and introduced. This procedure was repeated as required until a tube could be gently passed into the nasopharynx. The laryngeal inlet was visualized via direct laryngoscopy and the endotracheal tube placed using Magill forceps. Successful intubation was confirmed conventionally by the registration of end-tidal CO2 and via auscultation of pulmonary breath sounds bilaterally. The ET tube was secured in a standard manner. At this time epistaxis was rated as none, mild, moderate, severe. (“No epistaxis” indicated no bleeding, “mild epistaxis” represented any evidence of blood on the nasotracheal tube, “moderate epistaxis” indicated the ET tube is streaked obviously with blood, and “severe epistaxis” represented active bleeding or pooled blood in the pharynx sufficient to impede intubation). The amount of blood was visualized in the posterior oropharynx during DL before the chosen ET tube was passed through the vocal cords for successful intubation. The number of intubation attempts, amount of blood and number of times a new tube was chosen was recorded by the CRNA.
Data was collected and entered by myself into an Excel spreadsheet as transcribed from the difficult airway questionnaire created specifically for this study. The data was then analyzed by Biostastics Department at Nationwide Children’s Hospital using the Fisher exact T test. Univariate logistical regression was also used to determine relationships in the data set. All tests were conducted in SAS 9.3 (by SAS institute Inc., Cary, NC, USA)
Chapter 3: Results

The observed population had an age range of 2-10.9 (mean = 5.3) of which 55% were female. Of the 99 subjects that took part in this study 8 (8%) required multiple intubation attempts and 66 (66%) experienced mild, moderate or severe epistaxis as a result of the intubation.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Category</th>
<th>Total</th>
<th>Multiple Intubation Attempts</th>
<th>Single Intubation Attempt</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>44</td>
<td>12.5 (1)</td>
<td>47.3 (43)</td>
<td>0.0726</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>55</td>
<td>87.5 (7)</td>
<td>52.7 (48)</td>
<td></td>
</tr>
<tr>
<td>Soft Tissue Profile</td>
<td>Convex</td>
<td>82</td>
<td>50 (4)</td>
<td>85.7 (78)</td>
<td>0.0284</td>
</tr>
<tr>
<td></td>
<td>Straight</td>
<td>4</td>
<td>12.5 (1)</td>
<td>3.3 (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concave</td>
<td>13</td>
<td>37.5 (3)</td>
<td>11 (10)</td>
<td></td>
</tr>
<tr>
<td>Cricoid Used</td>
<td>No</td>
<td>73</td>
<td>25 (2)</td>
<td>78 (71)</td>
<td>0.0038</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>26</td>
<td>75 (6)</td>
<td>22 (20)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Statistically significant variables that correlated with number of intubation attempts (percentage of the population followed by actual number).

We found that there was a significant association between the soft tissue profile and the number of intubation attempts made to secure the airway. Patients requiring a single intubation attempt had a convex profile 85.7% of the time and a concave profile in only 11% of the presenting cases. However for patients requiring multiple
intubation attempts, 50% had a convex profile and 37.5% of the patients a concave profile (p= .0284). This difference was significant. Further, in those patients intubated successfully on the first attempt 39.6% had no bleeding and 26.4% had mild bleeding. However, for patients needing multiple intubation attempts 62.5% demonstrated severe bleeding (p=0.0022).

For patients who were intubated on the first attempt 22% received cricoid pressure. However for those who required multiple intubation attempts, 75% of patients received the use of cricoid pressure (p=0.0038). Our observation also found a significant difference in those who required cricoid pressure and the naris that was chosen for intubation. Where 1 intubation attempt was made the right naris was used 89% of the time, however for those requiring multiple intubation attempts 75% of the successful intubations took place via the left naris (p=0.0002).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Category</th>
<th>Total</th>
<th>Multiple Intubation Attempts</th>
<th>Single Intubation Attempt</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epistaxis severity</td>
<td>No bleeding</td>
<td>37</td>
<td>12.5 (1)</td>
<td>39.6 (36)</td>
<td>0.0022</td>
</tr>
<tr>
<td></td>
<td>Mild bleed</td>
<td>24</td>
<td>0 (0)</td>
<td>26.4 (24)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mod. bleed</td>
<td>22</td>
<td>25 (2)</td>
<td>22 (20)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe bleed</td>
<td>16</td>
<td>62.5 (5)</td>
<td>12.1 (11)</td>
<td></td>
</tr>
<tr>
<td>Nare Used</td>
<td>Right</td>
<td>83</td>
<td>25 (2)</td>
<td>89 (81)</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>Left</td>
<td>16</td>
<td>75 (6)</td>
<td>11 (10)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Statistically significant variables that correlated with number of intubation attempts (percentage of the population followed by actual number).

As a result patients for whom the left naris was used for intubation had higher odds of having multiple intubation attempts compared to patients who were intubated through the right naris. (odds ratio=24.3, 95% CI=(4.308, 137.054), p=0.0003). Further analysis revealed that the number of intubation attempts held no statistically significant relationships to any other categorical variables tested.

Finally we found that 18.4% of those patients having moderate or severe epistaxis during intubation experienced multiple intubation attempts while only 1.6% of patients with no or mild epistaxis required multiple attempts. (P=0.0048) Almost one third of patients (31.6%) of patients with moderate or severe epistaxis were intubated through the left naris while only 6.6% of patients who had no or mild epistaxis during intubation used the left naris. (P=0.0016).
Patients with moderate or severe epistaxis were older (5.4 ± 2.2 years) than patients with no or mild bleeding during intubation (4.4 ± 1.6) (p=0.0088) and also had a larger maximum incisal opening (40.5 ± 6 mm) than patients with no or mild epistaxis (37.4 ± 6.5 mm) (p=0.0275).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>No/Mild Epistaxis Mean (Std. Dev)</th>
<th>Mod/Severe Epistaxis Mean (Std. Dev)</th>
<th>P-value (2 sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>99</td>
<td>4.35 (1.61)</td>
<td>5.44 (2.18)</td>
<td><strong>0.0088</strong></td>
</tr>
<tr>
<td>Thryomental Distance (cm)</td>
<td>99</td>
<td>5.39 (2.96)</td>
<td>5.12 (1.54)</td>
<td>0.8160</td>
</tr>
<tr>
<td>Incisal Opening (mm)</td>
<td>99</td>
<td>37.38 (6.49)</td>
<td>40.47 (6.03)</td>
<td><strong>0.0275</strong></td>
</tr>
<tr>
<td>Size of ET tube</td>
<td>99</td>
<td>4.60 (0.51)</td>
<td>4.78 (0.54)</td>
<td>0.1252</td>
</tr>
</tbody>
</table>

Table 4. Statistically significant variables that correlated with number of intubation attempts (percentage of the population followed by actual number).
Chapter 4: Discussion

Our bleeding rates were consistent with the current literature findings for NT intubation and epistaxis, we recorded bleeding 66% of the time with the literature stating epistaxis rates from 17-77%. We found there was a significant relationship of soft tissue profile and number of intubation attempts. An important part of the anesthesiology airway assessment is the facial profile with the convex profile being taught as often much more difficult. In our study a concave profile was more likely to have multiple attempts. There was a significant relationship between moderate and severe bleeding and number of intubation attempts, and in 66% of those patients with severe bleeding there were multiple intubation attempts. There was a near significant relationship of gender predilection for multiple attempts (7 out of 8 multiple attempts were male). (p = .0725) The fact that a concave profile had a significant relationship with the number of intubation attempts differs from most studies concerning oral intubations.

Thyromental distance and Malampati score did not seem to have a significant relationship with either the number of intubation attempts or severity of bleeding. Interestingly these two assessments, along with soft tissue profile and maximum opening continue as the gold standards for assessing airways. The importance of
these items has however been discussed and our results question further the validity of these particular assessments.

This may demonstrate that multiple attempts led to an increase in bleeding due to increased trauma or that bleeding from the nose into the oropharynx and hypopharynx contributed to a difficult view of the larynx for passing the tube between the cords. Patients who tended to bleed more severely were older in age. Patients who were able to open their mouths wider were at a higher risk for bleeding. This second finding may have been due to age.

No difficult airways were encountered during the study possibly due to the self-limiting nature of the convenience sample we used. All 3 patients with complications had mod/severe bleeding and an almost significant p value of .0538. We did however encounter multiple intubation attempts. As mentioned before, multiple intubations attempts are already a known issue for causing epistaxis. Future studies should further understand if the multiple intubation attempts were with the same tube. It would also be valuable to know where in the process the CRNA stopped and reattempted intubation again. Also there was a significant relationship of which naris was used for intubation. Using the left naris for intubation was statistically significant possibly due to the type of NT tube used. The tubes used in the DSC are Mallinckrodt and designed to be introduced into the right side. If we had controlled for this by using Parker tubes right versus left would not have been a factor.
This was the first study of its nature in terms of looking at nasotracheal intubation in the pediatric population. Compared to other studies, it had an appropriate sample size but did not have the inter/intra rater reliability that the other studies had. Unique to this study was, that we were successful in finding parameters, which appeared to be correlated with multiple attempts.

The clinical relevance from this study was that we might be able to create an algorithm or define a set of factors to alert anesthetists about a difficult NT intubation in children. It would also be helpful for those pediatric dentists who plan on having GA done in office, a screening tool to alert the anesthesiologist of a possible DA. Ultimately it would allow an anesthesiologist to decide what is best for the patient and decide against using a NT tube.

Limitations of this study were lack of calibration for CRNA’s and the physician anesthesiologists. For the first 20 subjects, the protocol was clearly explained to both the physician anesthesiologist and the CRNA and they were monitored to ensure they were following the protocol. After the first 20 subjects, data collection was done autonomously without direct supervision. Other limitations were that this study used a convenience sample from central Ohio included only patients from the surgery center attached to the dental clinic at Nationwide Children’s Hospital.

Future considerations for this study would include increasing the sample size to strengthen our power. It would be important to determine inter and intra rater reliability and to ensure that the anesthesiologists and CRNA’s were fully calibrated. Further studies might better understand the relationship of cricoid pressure and if it
contributed to multiple intubation attempts or if the act of providing cricoid pressure caused multiple attempts. Additionally, using radiographic imaging such as cephalometric radiograph or orthopantogram may better allow us to accurately understand the skeletal relationships of patients versus a subjective assessment of a patient’s soft tissue profile. It would also be helpful to understand how bleeding in the posterior oropharynx impeded the view of the vocal cords and contributed to a difficult intubation.
V. Conclusion

1. There appears to be a relationship between the concave facial profile of a patient and how difficult it is to nasally intubate such a patient. As expected, moderate and severe epistaxis complicates NT intubation particularly after multiple intubation attempts, although none of the patients in this study had a difficult airway by the definition. Our results indicate that older male children with a concave profile would be more difficult to intubate.

2. There were 4 variables that were statistically significant for correlation with multiple intubation attempts. They were soft tissue profile, naris used, cricoid pressure used and epistaxis severity.

3. There were 2 variables which correlated statistically with epistaxis severity. They were age of patient and maximum incisal opening.
References


Appendix A: Difficult Airway Pre Anesthesia Questionnaire

<table>
<thead>
<tr>
<th>Pre-op history</th>
<th>Pre-op exam</th>
<th>Intraoperative</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ atraumatic right epistaxis</td>
<td>MP Class _____</td>
<td>view of cords _____</td>
</tr>
<tr>
<td>□ atraumatic left epistaxis</td>
<td>thyromental _____ cm</td>
<td># attempts _____</td>
</tr>
<tr>
<td>□ bleeding disorder</td>
<td>incisal opening _____ mm</td>
<td>epistaxis _____</td>
</tr>
<tr>
<td>□ tonsillectomy</td>
<td>tonsils _____ +</td>
<td>severity _____</td>
</tr>
<tr>
<td>□ adenoidectomy</td>
<td>profile = (‘ ‘) ‘ l’</td>
<td>cricoid used</td>
</tr>
<tr>
<td>□ snoring</td>
<td></td>
<td>nare = R or L</td>
</tr>
<tr>
<td>□ OSA</td>
<td></td>
<td>size of ett _____ cm</td>
</tr>
<tr>
<td>□ craniofacial syndrome</td>
<td></td>
<td>unanticipated sizing</td>
</tr>
<tr>
<td>□ head and neck trauma</td>
<td></td>
<td>cuff</td>
</tr>
<tr>
<td>□ seasonal allergies</td>
<td></td>
<td>video assistance</td>
</tr>
<tr>
<td>□ eczema</td>
<td></td>
<td>paralytics</td>
</tr>
<tr>
<td>□ asthma</td>
<td></td>
<td>complications _____</td>
</tr>
<tr>
<td>□ food allergies</td>
<td></td>
<td>bronchospasm</td>
</tr>
<tr>
<td>□ premature birth</td>
<td></td>
<td>laryngospasm</td>
</tr>
<tr>
<td>□ tracheal stenosis</td>
<td></td>
<td>post-op admit</td>
</tr>
<tr>
<td>□ tracheomalacia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ TMD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ nocturnal bruxism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ ASA in 1 week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ ibuprofen in 48 hours</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Patient ID**