Pediatric Anesthesia Update for The Oral and Maxillofacial Surgeon

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HISTORY AND INTRODUCTION

The fields of dentistry and anesthesiology have been historically intertwined, dating back to 1844 when the dentist Horace Wells promoted nitrous oxide.[1] During that time period, "dentistry was the qualitative and quantitative leader in the provision of anesthesia."[1,2] During the 1940s and WWII, anesthesia for general surgical procedures relied on dentists, who were evolving into the profession of oral and maxillofacial surgery.[3] The oral surgical specialty and anesthesiology continued to evolve together with the American Board of Oral Surgery and the American Board of Anesthesiology forming only one year apart. The field of Pediatric Anesthesia began to emerge when M. Digby Leigh authored *Pediatric Anesthesia (1948),* the first North American text on this subject.[4]

As the knowledge and care for the anesthetized pediatric patient continues to evolve, the oral and maxillofacial surgeon must stay abreast of these advances. Applications range from routine in-office care to major craniofacial surgery. The purpose of this article is to 1) review the pediatric airway and physiology, 2) update the oral and maxillofacial surgeon on anesthetic techniques used during management of the pediatric patient, 3) describe major anesthetic complications in craniofacial surgery, and 4) explore the future of OMS providing in-office pediatric anesthesia.

ANATOMIC AND PHYSIOLOGIC DIFFERENCES BETWEEN CHILDREN (UNDER 12) AND ADULTS (OVER 12)

First and foremost is always the airway.[5] The pediatric airway is not funnel-shaped and these children are not small adults. They have "disproportionately large heads perched on their tiny necks, connected to a wide thorax of immature cartilaginous ribs atop a large protuberant abdomen."[6] They are obligate nasal breathers until 5 months old.[6] The term “child” requires clear definition based on age of the patient (**Table 1**). Children have an epiglottis that is comparatively longer and more "floppy" than their adult counterpart, and the larynx is more anteriorly and superiorly positioned.[6,7] It is traditionally held that the narrowest portion of the pediatric airway is located at the cricoid cartilage,[8] however a recent study comparing computer tomograms of the pediatric airway suggests the subglottic area is the narrowest transversely due to the airway's elliptical shape.[6,9]

TABLE 1: Age-based Definitions of Pediatric Patients	
Pediatric Subpopulation	**Approximate Age Range**
Newborn	Birth to 1 mo of age
Infant	1 mo to 2 y of age
Child	2 to 12 y of age
Adolescent	12 to 21 y of age

(Source: Krishnan D: Anesthesia for the Pediatric Oral and Maxillofacial Surgery Patient. Oral Maxillofacial Surg Clin N Am 30:171-181, 2018.)

The pediatric patient may have significant congenital craniofacial differences that would contribute to a difficult airway.[10] Children with Pierre-Robin sequence present with mandibular hypoplasia, which positions the base of tongue and hypopharyngeal tissue posteriorly and occludes the airway. Children with hemifacial microsomia range in presentations, from having mildly hypoplastic mandibles to essentially missing Ramus-Condyle Units (RCUs). The RCU may be ankylosed to the skull base, which presents with its own airway considerations. Crouzon, Apert, and Pfeiffer are the most common syndromic craniosynostoses, and all have some component of airway obstruction due to premature suture fusion and growth inhibition extending to cranial base.[11] Being cognizant of possible craniofacial differences in children alerts the oral and maxillofacial surgeon to alter anesthetic treatment plans or surgical environments (i.e., hospital) if indicated.

All children, syndromic or not, commonly present with Upper Respiratory Infections (URIs) the day of a routine OMS office procedure. There are no case controlled studies to address the question whether one should move forward with anesthetizing or cancelling the case, but prudency and caution should guide the practioner.[6] Laryngospasms are more common in the pediatric population especially if the child has a history of a reactive airway.[12] Therefore, proper vigilance and appropriate patient positioning is paramount. For example, in the postoperative period, a child routinely positioned in the lateral decubitus position serves two purposes: 1) the airway is larger in this state than when positioned supine, and 2) if Postoperative Nausea/ Vomiting (PONV) results in emesis, the material may more easily be expelled than aspirated.[12]

There are significant differences between children and adults in respect to cardiopulmonary function. Since pediatric ribs are more cartilaginous and horizontal in vector, children have an increased chest wall compliance, risk for paradoxical breathing, and lower functional reserve capacity (**Table 2**).[6] Pediatric alveoli are comparatively smaller and fewer in number.[6] Since children have increased oxygen consumption and limited physiologic reserve, they tolerate hypoxemia for a much shorter duration of time. Children are able to improve minute ventilation only by increasing respiratory rate.[6] Therefore, the common theme in Pediatric Advanced Life Support (PALS) prioritizes the need to address hypoxia. When hypoxia remains uncorrected, often due to respiratory failure, the terminal event is cardiac arrest.[8] Furthermore, the pediatric left ventricle is fixed and noncompliant when compared with that of an adult.[6] In order to increase cardiac output, children must essentially rely on their heart rate.[6] The autonomic system of a child is immature, however, so tachycardia remains blunted in a hypotensive state.[6]

TABLE 2: Comparison of Pulmonary Physiologic Parameters of the Child Versus the Adult		
Variable	**Infant**	**Adult**
Respiratory frequency	30-50	12-16
Tidal volume (mL/kg)	6-8	7
Dead space (mL/kg)	2-2.5	2.2
Function reserve capacity (mL/kg)	25	40
Oxygen consumption (mL/kg/min)	6-8	3-4

(Source: Krishnan D: Anesthesia for the Pediatric Oral and Maxillofacial Surgery Patient. Oral Maxillofacial Surg Clin N Am 30:171-181, 2018.)

A child does not obtain normal renal function often until age 2, thus judicious use of fluids and closely monitoring volume status is paramount.[12,6] This includes the updated ASA *nil per os* (NPO) guidelines (**Table 3**). Note that 4 hours are required between breast milk and surgery but 6 hours are required between infant formula and surgery. A recent poll of 431 oral and maxillofacial surgeons in private practice showed the overwhelming majority (99.1%) did not adopt current ASA guidelines. Longer fasting times were recommended instead.[13] For children however, NPO longer than even a few hours results in larger swings in fluid balance compared to adults, which is due to children's proportionally smaller total volumes. On the other hand, children do have a higher incidence of reflux and a parent's ability to accurately monitor a child's NPO status may prove difficult.[6] Therefore, decisions to deviate from the ASA recommended NPO guidelines must be case-specific as all of these factors must be considered.

TABLE 3: ASA Guidelines for Food and Fluid Intake before Elective Surgery	
Time before Surgery	**Food or Fluid Intake**
Up to 8 hours	Food and fluids as desired
Up to 6 hours*	Light meal (e.g., toast and clear liquids); infant formula; nonhuman milk
Up to 4 hours*	Breast milk
Up to 2 hours*	Clear liquids** only; no solids or foods containing fat in any form
During the 2 hours	No solids, no liquids

**This guideline applies only to patients to are NOT at risk for delayed gastric emptying, thus excluding the following patients: morbid obesity, diabetes mellitus; pregnancy; history of gastroesophageal reflux; surgery-limited stomach capacity; potential difficult airway; opiate analgesic*

***Clear liquids are water, sports drinks, coffee or tea WITHOUT milk. The following are NOT clear liquids: juice with pulp; milk; coffee or tea with milk; infant formula; any beverage with alcohol.*

(*Source: Miller R and Pardo, Jr M:* Basics of Anesthesia, *6th ed. Saunders. 2011.*)

The psychological state of the child may be one of the hardest hurdles to cross in providing anesthesia for this patient population. The perioperative encounter requires appropriate interaction with the child, speaking directly to the child, and including terms consistent with the child's development.[12] Describing "laughing gas" through a decorated mask may be appropriate.[12] Children under 3 years of age are considered pre-cooperative and possess fewer cognitively coping mechanisms than their older counterparts.[10] Weighing the indication for surgery against potentially creating a formative "bad experience" also must be considered.[10] One out of 68 children in the United States has autism, and autistic children cope better with familiar environments.[6] For autistic children, scheduling the consultation and procedure appointments close together and sending the child home with a mask after the preoperative appointment may help alleviate stress.[6]

The child also may carry potential underlying medical diagnoses that may affect anesthetic management. For example, there is a 5% prevalence of Attention Deficit Hyperactivity Disorder (ADHD) in United States children. If these children are on methylphenidate, halogenated anesthetics are specifically contraindicated since a hypertensive crisis may develop.[6] Furthermore, it is paramount to always consider the child’s pre-existing medication list. For example, if the patient takes a Selective Serotonin Reuptake Inhibitor (SSRI), platelet aggregation may be inhibited, and difficulty/inability to control bleeding will result.[6] In general, children who fall under the ASA classification I and II guidelines are considered reasonably safe to sedate in an office setting. The bar to treat a child in the hospital should not be set high, however, and even some ASA class II patients, such as an overweight asthmatic with limited mouth opening, would be safer in a hospital setting.

TECHNIQUES: AIRWAY

Part of the oral and maxillofacial surgery’s impressive historical anesthetic track record is attributed to a thorough understanding of airway management.[1] Can one ventilate? Can one intubate? This begins during the preoperative evaluation, noting Mallampati score, chin-throat distance, obesity, and neck mobility in order to predict difficulty performing ventilation and intubation.[5,7] Identifying the difficult airway, however may be more difficult with the pediatric patient since children often do not tolerate the techniques required to complete the exam.[14] During the sedation, early recognition of potential emergencies is key. When a child obstructs, as they are prone to due to a proportionally large tongue and small airway, the practitioner hears a change in precordial stethoscope, notes the absence of appropriate chest rise and fall, and sees a blunted waveform on capnography.[10,7] Positional maneuvers include the sniffing position, chin lift, and jaw thrust.[8] When the pulse oximetry monitor shows a decreased saturation from the norm of 100%, one must remember this tool shows a delayed reading, and the patient's actual hypoxemia may be profound.

To intervene, ventilation with use of a bag-mask requires the "E-C clamp" two-hand technique, but this requires the addition of a second provider to squeeze the bag.[8] (**Figure 1A**) If only one provider is available, he or she must possess the skills to keep a tight seal with one hand while squeezing the bag with the other.[7,8] (**Figure 1B**)

***Figure 1A**: Two-rescuer technique where an additional hand is free to better maintain mask seal. (Source: Pediatric Advanced Life Support. Circulation. 2000;102(suppl I): I-291-I-342.)*

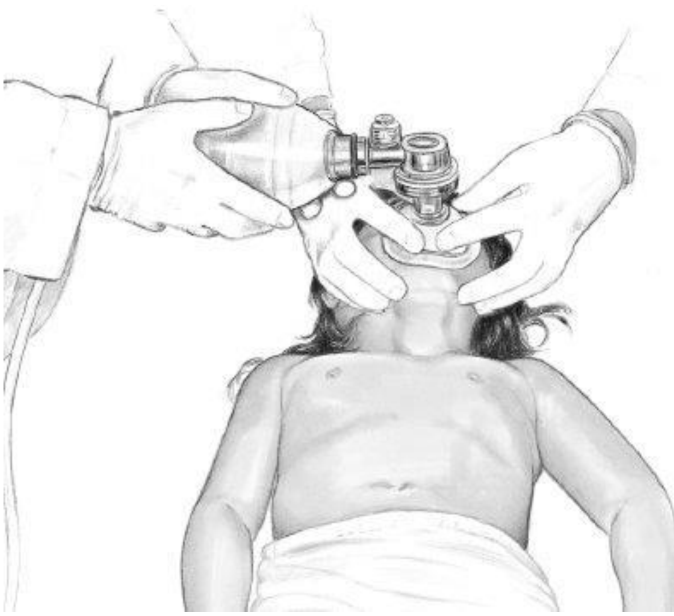

***Figure 1B:** One-rescuer bag-mask ventilation using the "E-C clamp" technique. The thumb and forefinger form a C-shape around the mask and maintain downward pressure. The 3rd, 4th, and 5th fingers form the E and maintain the jaw thrust forward. (Source: Pediatric Advanced Life Support. Circulation. 2000;102(suppl I): I-291-I-342.)*

If ventilation is not adequate, advanced airways should be considered. Advanced airways are categorized by function or anatomic position.[14] For example, an Oral-Pharyngeal Airway (OPA) is functionally a ventilation-assist device and anatomically sits behind the tongue.[14] If an OPA is inappropriately sized or positioned incorrectly, however, then the airway is further obstructed.[14] (**Figure 2**) Also, use of OPA in a pediatric patient at a lighter plane of anesthesia may cause laryngospasm, so the Nasopharyngeal Airway (NPA) is a wiser first choice.[7] When placing the NPA, attention must be given to perform this atraumatically and not cause pharyngeal bleeding since blood in the hypopharynx may precipitate a laryngospasm.[14]

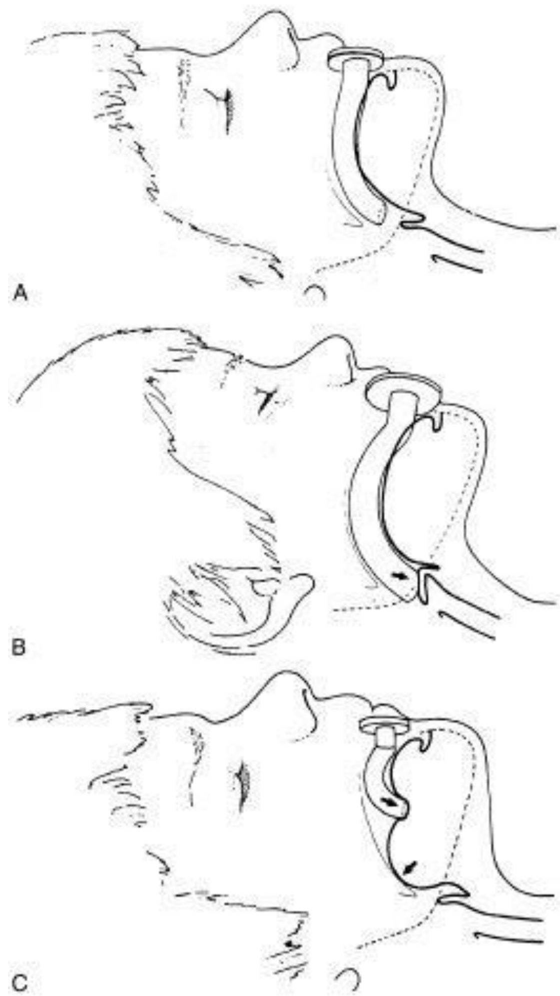

***Figure 2:** **A**, sized and placed OPA. **B**, an OPA that is too large, sitting directly on the epiglottis and obstructing the airway. **C**, an OPA that is too small, displacing the tongue and obstructing the airway. (Source: McNiece W and Dierdorf S: The Pediatric Airway. Seminars in Pediatric Surgery. 13:152-165, 2004.)*

The Laryngeal Mask Airway (LMA) has become an invaluable tool such that the ASA guidelines for managing the difficult airway shifts away from nonemergent once this device is in place.[7] The LMA is relatively easy to insert, does not require visualization of the vocal cords, and it sits immediately behind the base of tongue and above the glottic inlet.[14] It is not a definitive airway since it sits above the vocal cords. When nearing the end of a case and emerging a patient from anesthesia, one must consider when to remove the LMA. Generally, one may remove the airway while the child is “deep” (general anesthesia) or emerged (able to support his/her own airway). Interestingly, in a randomized controlled trial of 92 children subjected to removal of LMA upon emergence, those randomized to the awake group had more anesthesia-related complications when compared with those randomized to the deep state.[15]

A secure airway passes the vocal cords and usually consists of an endotracheal tube. The endotracheal tube for infants and children may be estimated by using the following formula: (Age + 16)/4= Endotracheal tube size.[7] Direct laryngoscopy is often successful. Alternative techniques also must be practiced however, in order to be adequately prepared for when the unexpected difficult airway arises.[14] Intubating LMAs, such as the newer "Air-Q disposable intubating LMA" is one technique. This instrument only is available in four sizes compared to the standard LMA, which is available in eight.[7] The Glidescope is a 60-degree laryngoscope equipped with a camera. It does not require direct line of site into the vocal cords and thus requires less cervical spine motion for successful definitive airway placement.[7] The Glidescope's disadvantage is its limited number of sizes, thus it may be too large for the pediatric child.[7] Another option is the fiberoptic endoscope for intubation. Fiberoptics offer immense flexibility and directability to navigate the pediatric airway. It is an "invaluable aid" for children especially with congenital and acquired abnormalities.[14] Bronchoscopes are as small as 2.2mm, which may advance an endotracheal tube as small as 3.0mm, however these smaller scopes do not have suction to address potential bleeding from the nasopharynx.[7,14] To address this problem, combining adjunctive intubating techniques (fiberoptic and Glidescope) in a difficult scenario may keep a difficult airway case out of the emergent pathway.

In an office setting, usually oral and maxillofacial surgery providers target deep sedation/general anesthesia with an “open airway.” Appropriate patient selection is key. If instead a patient presents with any of these alerts previously discussed (ex. craniofacial child with limited mouth opening) hospital treatment is the wiser choice. Some OMS offices do move forward with intubations in their office on major surgical cases (ex. orthognathics), however these cases usually are staffed with a separate anesthesia provider and the facilities must satisfy additional state and federal regulations.

TECHNIQUES: INHALATIONAL PHARMACOLOGIC AGENTS

When administering pediatric anesthesia, the ideal pharmacologic agent includes "anxiolytic and analgesic efficacy, ease of administration and tolerability, rapid and predictable onset, controllable duration of action, minimal respiratory depression, anterograde amnesia, and incur minimal acquisition and administration costs."[10] It is better to administer drugs that one has experience administering rather than to attempt giving a variety of drugs for a variety of situations.[10]

The two workhorse inhalational anesthetic agents used in the OMS office are nitrous oxide and sevoflurane, although there are others that are less commonly used. Nitrous oxide has the highest Minimal Alveolar Concentration (MAC) (104) of any other inhalational agent commonly used, and it is the least potent.[7] Its advantage is in its blood:gas coefficient (0.46), which is similar to desflurane and thus equates clinically to fast onset/fast offset times.[7] This agent also provides analgesia and may be used in combination with other inhalational agents in a balanced anesthetic technique.[16] There is a wide margin of safety with this agent, although methemoglobinemia has been reported as a rare possible complication in susceptible patients while nausea and vomiting are seen as the common side effect.[7] Nitrous oxide is categorized as a pregnancy risk category Class C drug, therefore healthcare providers who are of child-bearing potential may need to avoid exposure.

Sevoflurane has a MAC of 1.8% in adults and 2.5% in children.[7, 17] When used along with 60% nitrous oxide, MAC requirements in children decrease 25%.[17] Its popularity has grown immensely, which is partially attributed to its quick onset/offset time. Its blood:gas partition coefficient (0.65) is similar to nitrous oxide and desflurane, which is approximately half that of isoflurane.[7] Since sevoflurane is odorless and tasteless, it confers a significant advantage over other inhalational anesthetics, especially for children who tend to receive mask inhalation before intravenous access.[17] The disadvantages of sevoflurane are relatively high cost, theoretical risk of compound A, and its relative contraindication in patients with seizure disorders.[17]

TECHNIQUES: INTRAVENOUS PHARMACOLOGIC AGENTS

Four familiar intravenous agents used in the OMS office are midazolam, fentanyl, propofol, and ketamine. (**Table 4**) Midazolam is titrated to effect, which equates to usually 2-5mg given during the case. Midazolam may be reverse with flumazenil (0.2mg IV), however resedation may occur due to this reversal's short half life and seizures are a possible adverse effect.[7,18] Fentanyl is not titrated but weight based, which equates to usually 50-100mcg given during the case, and it may be reversed with naloxone (0.04mg IV).[7,18] Practitioners must be cognizant of overshooting analgesia reversal and causing acute pain, tachycardia, and emergence delirium.[7] Propofol is usually maintained at an infusion from 50-150mcg/kg/min, but profound hypotension and respiratory depression may occur, so ketamine may be added for its sympathomimetic and bronchodilator effects.[7,18]

TABLE 4: Four Commonly Used Pharmacologic Agents in the OMS Practice				
Drug	**Dose (IV)**	**Onset**	**Duration of Action (min)**	**Indication**
Midazolam	0.1-0.2mg/kg	5 (min)	15-20	Anxiolysis and anterograde amnesia
Fentanyl	5-15mcg/kg	2-5 (min)	30-60	Analgesia
Propofol	1.5-2.5mg/kg	15-30 (sec)	3-8	Anesthesia
Ketamine	1-2mg/kg (4-6mg/kg IM)	15-30 (sec) IV; 5-10 (min) IM	5-10	Dissociative anesthesia and analgesia

From Miller R and Pardo, Jr M: Basics of Anesthesia *6th ed. Saunders. 2011.*

Cusick. Anesthesia Critical Care Reference Sheet. www.accrs.com. 22 Jul 2018.

Anesthetic techniques may incorporate or even substitute agents with Remifentanil, which is an ultra-short acting opioid, and dexmedetomidate, which agonizes the alpha-2 receptor.

The OMS historical track record with traditional and known agents with decades of data underlines the point, however, that one does not need to "re-invent the wheel" for routine dentoalveolar cases. Incorporating newer agents must be done in a careful manner. This is especially true for the oral and maxillofacial surgeon during these current legislative times.[1,6]

SAFETY EQUIPMENT REQUIREMENTS

Requirements for deep sedation/general anesthesia are defined by state and federal laws (Center for Medicaid Services). Requirements usually include the following, although variations among states exist, such as credentialing requirements for assistants.[17,19,20]

1) Continual monitoring of heart rate, blood pressure, respiration, and expired carbon dioxide (CO_2). Electrocardiographic monitoring, pulse oximetry, and end-tidal CO_2 must be utilized.

2) Blood pressure and heart rate must be recorded every five minutes. Respiration rates must be recorded at least every 15 minutes.

3) The person administering the anesthesia must be present during the administration of the anesthetic and be appropriately certified. He/she must be assisted by two assistants who are certified by Basic Life Support. During the recovery phase, the patient must be continually observed by a credentialed personnel.

4) Records must be updated in a timely manner and include blood pressure, heart rate, respiration, pulse oximetry, end-tidal CO_2, drugs administered including amounts and time, length of procedure, and any complications.

5) The operatory theater must comply with facility requirements and be large enough to adequately accommodate the patient along with a team consisting of at least three individuals.

6) There are additional specifications that may be further defined by state laws, such as lighting system, suction, and oxygen delivery requirements along with backup systems. Specifications in anesthetic materials such as laryngoscopes, oral airways, and medications such as bronchodilators may be further defined by state laws.

ANESTHETIC COMPLICATIONS

The oral and maxillofacial surgeon plays a leading role along a large spectrum of anesthetic applications, from office-based to even major craniofacial surgery. Several studies have looked at the prevalence of major anesthetic complications in craniofacial surgery. The first series to report on safety was in 1979.[21] 793 cases combined from 6 centers reported a 16.5% morbidity and 1.6% mortality (13 deaths) rate.[21] These morbidity and mortality rates sometimes are used as a standard reference even today when a craniofacial team considers risks versus benefits to operate. The quality of anesthesia and technologies have obviously advanced since 1979, so it was necessary to reassess those risks. A more current retrospective study from years 2012-2015 combined patients from 31 craniofacial institutions.[22] Out of 1,223 patients, there were no deaths.[22] Causes of morbidity included cardiac arrest, postoperative seizures, unplanned postoperative mechanical ventilation, and large-volume transfusion.[22] Goobie in the *Journal of Anesthesiology* in 2015 then went a step further to predict variables that may influence morbidity (**Figure 3**), and he found a 14.7% rate of cardiorespiratory events and 29.7% hemorrhagic events requiring Intensive Care Unit admit.[23] Overall, the prevalence of major anesthetic complications in craniofacial surgery has decreased over time although there still is a risk of poor outcome even with contemporary techniques. As a leader on a craniofacial team encountering case-specific scenarios, it behooves the oral and maxillofacial surgeon to properly weigh in on the decision whether or not to operate.

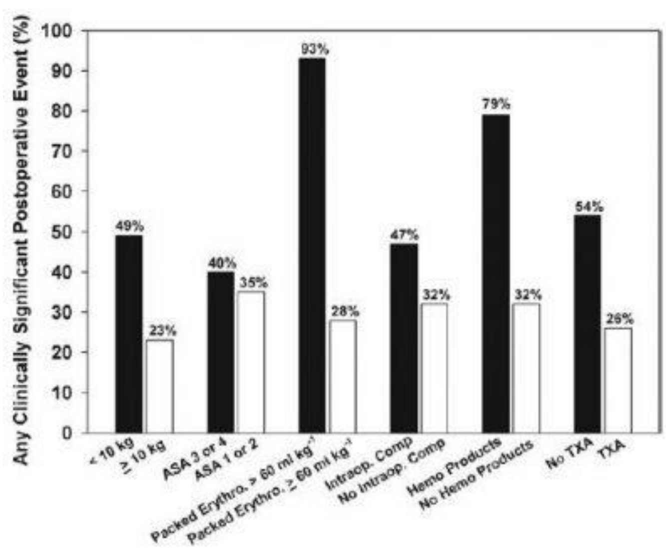

Figure 3: *Predictors of clinically significant postoperative events in craniofacial surgery. (From Goobie SM, et al. Predictors of Clinically Significant Postoperative Events after Open Craniosynostosis Surgery. Anesthesiology. 122:1021-32, 2015.)*

THE FUTURE

Oral and maxillofacial surgeons have provided anesthesia in an office setting since the inception of anesthesia, and an impressive safety record has been set. The most comprehensive data to date from the Oral and Maxillofacial Surgery National Insurance Company (OMSNIC) estimated from 2000 to 2013, oral and maxillofacial surgeons have provided 39,392,008 outpatient anesthetics and there was an occurrence of 1 adverse event (death or brain injury) for every 348,602 anesthetics.[1] Even so, unfortunately the oral and maxillofacial surgeon remains excluded as a "non-anesthesiologist" per the ASA advisory.[2] In a review by *Pediatric Anesthesia* in 2013, there were 8 anesthetic deaths related to dentistry when the oral and maxillofacial surgeon was the anesthetic provider and 7 anesthetic dental deaths when an anesthesiologist was the anesthetic provider.[1,24] There was no mention of overall cases performed in the study. Therefore, these events had no denominator and could not appropriately compare OMS with other anesthetic deaths. It is likely that the oral and maxillofacial surgeon anesthetized a significantly greater number of patients than the anesthesiologist.[1,24]

In 2010, the Centers for Medicare and Medicaid Services (CMS) incorporated new anesthesia guidelines:

"There to be a single anesthesia service or department responsible for developing policies and procedures for all anesthesia services including sedation and analgesia. This department shall also determine the minimum qualifications for each practitioner permitted to provide anesthesia services of all forms in all locations within the hospital.[1]

The CMS requirements "do not apply to the administration of topical or local anesthetics, minimal sedation, or moderate sedation."[1] In one OMS training program, these new guidelines adversely affected the program's ability to provide patient care.[1] They were essentially no longer permitted to provide deep sedation and general anesthesia, and surgical suites at the training program were literally converted to closet space.[1] Increasingly, stringent requirements not only are influencing OMS residency programs, but also medical anesthesiology is identifying a "lack of exposure to office-based anesthesia" in their own residency programs.[25] The end result for pediatric patients requiring even a simple oral surgical procedure under appropriate anesthesia may be inadequate access to care.[1,10]

Current-day news media often paint the point of view that the oral and maxillofacial surgeon as provider-anesthetist is unsafe. In a review of 13 OMS anesthetic complications that proceeded to litigation in federal and/or state courts, 4 cases (30%) used a third-party anesthetist model.[26] Therefore, it cannot be concluded that adding yet an additional anesthesia provider will change outcomes. If local anesthesia alone is held to be the safest technique, consider that 2 out of those 13 complications were directly related to the use of local anesthesia.[1,26]

The purpose of this article is to:

1) Review the pediatric airway and physiology

2) Update the oral and maxillofacial surgeon on anesthetic techniques used during management of the pediatric patient

3) Describe major anesthetic complications in craniofacial surgery

4) Explore the future of OMS providing pediatric anesthesia

The intertwined history of oral and maxillofacial surgery and pediatric anesthesia bears proof of their interdisciplinary dependence. Only the OMS practitioner is thoroughly trained to the furthest extent of concomitant administration of adequate analgesia, amnesia, and anesthesia while appropriately managing the airway during an oral surgical procedure. The ability for an oral and maxillofacial surgeon to offer deep sedation/general anesthesia to appropriately selected pediatric patients does not pose additional anesthetic risk versus an CMS-approved anesthetist. Instead, oral and maxillofacial surgeons continuing to provide anesthesia improves access to care for these children, and it certainly affords the child a safer and more effective option than a papoose-board.

Ultimately, the future of governmental and state board regulations is cloudy regarding pediatric office-based anesthesia. It is prudent to be professionally active in continuing education and careful in patient selection for these outpatient anesthetic techniques. Advocacy-based efforts to demonstrate the safe track record oral and maxillofacial surgeons have in office-based pediatric anesthesia should also be a component of promoting access to care for many children who would otherwise be needlessly hospitalized. Continued compliance with the evolving standards of care is a critical component of providing safe and effective office-based anesthesia for children.

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