Considerations for Pediatric Craniofacial Surgeons During the COVID-19 Outbreak

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The Coronavirus Disease 2019 (COVID-19) outbreak was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. One week later, the Centers for Medicare and Medicaid Services (CMS) issued a statement that "all elective, nonessential medical, surgical, and dental procedures be delayed" during the COVID-19 outbreak to minimize spread of the SARS-CoV-2 virus and preserve personal protective equipment (PPE).[1] The CMS recommendations created a tiered framework to guide surgeons and healthcare systems in their determination of which procedures are elective based on acuity, risk of progression, and symptomatology. The guidelines also take into account staffing support, ventilator availability, and patient comorbidities. The CMS report spurred action at the state level, with similar recommendations issued regarding postponement of elective surgeries and procedures. This report presents recommendations issued by state governing bodies as of 5PM EDT on March 24, 2020. Thirty states and the District of Columbia provide recommendations or orders regarding the postponement of elective procedures. As of this time, the only state to mention consideration of patient age is Arizona, which recommends surgeons "consider the health and age of the patient."[2]

The pediatric population has been largely spared during the COVID-19 outbreak, with incidence of COVID-19 infection of less than 1% in children under 10 years of age and less than 2% in children under 19 years of age.[3–6] However, children have been found to be asymptomatic carriers of SARS-CoV-2 with reports of transmissions from asymptomatic children to adults.[7,8] Of special note, aersolizing procedures increase transmission risk of COVID-19; craniofacial surgeons face high risk of COVID-19 infection due to exposure risks of operating in or near the oral cavity.[9,10] Current recommendations for PPE use during surgical procedures on suspected or confirmed COVID-19 patients suggest the use of either a N95 or powered air-purifying respirator (PAPR).[11] Clinical stability of a patient with active COVID-19 infection and risk of transmission to healthcare staff must be carefully considered before surgical intervention.

The pediatric surgical population is unique for several reasons; most notably the time-sensitive nature of many pediatric interventions. This poses a unique challenge when applying guidelines aimed at an adult population; no state recommendations address the nuances of pediatric surgical practice. We discuss common craniofacial procedures and relate these to the CMS tiered framework. We make special note of cases in which the time-sensitive nature of a condition may prompt more urgent surgical intervention. We reference state recommendations as applicable. Recommendations contained in this report (Supplemental Digital Content, Table 1, http://links.lww.com/SCS/B428) should serve only as general guidance; craniofacial surgeons must individualize treatment recommendations based on their patients' unique circumstances as well as their institutional and state policies.

CLEFT LIP/PALATE AND ASSOCIATED ANCILLARY PROCEDURES

Primary cleft lip and palate repair is a low acuity surgery performed in a healthy patient, making this a Tier 1a procedure; CMS recommends these surgeries be postponed. However, cleft palate repair performed after the age of 12 months is associated with worse speech outcomes; for this reason, cleft palate repair is usually favored to be performed prior to 12 months of age.[12,13] Cleft lip and palate revisions, including lip revision, tip rhinoplasty, and speech surgery, are likewise Tier 1a procedures and should be postponed. Alveolar bone grafting is a time-sensitive procedure as this must be timed with eruption of the permanent canines; this timing should be taken into account when scheduling the intervention.

No state guidelines specifically mention cleft lip or palate repair or associated procedures.

ORTHOGNATHIC SURGERY

Orthognathic surgery is a low acuity surgery generally performed in a healthy patient, making this a Tier 1a procedure. Though timing of orthognathic surgery is dependent on orthodontic treatment and skeletal maturity, postponement of orthognathic surgery does not interfere with orthodontic treatment.

No state guidelines specifically mention orthognathic surgery; however, 12 states and the District of Columbus specifically mention that elective dental procedures be postponed.[2,14–24]

MANDIBULAR DISTRACTION OSTEOGENESIS/ TONGUE LIP ADHESION

Mandibular distraction osteogenesis (MDO) or tongue lip adhesion (TLA) is typically performed for patients with airway obstruction due to retrognathia and glossoptosis in Pierre Robin Sequence. In situations where MDO or TLA is performed to avoid intubation or tracheostomy, the procedure would be classified as Tier 3a and should not be postponed. In situations where the patient is healthy in an outpatient clinic setting, MDO or TLA is classified as Tier 1a; however, the age of the patient must be taken into account to determine importance of timing of the procedure.

No state guidelines specifically mention MDO or TLA procedures.

CRANIOSYNOSTOSIS

Craniosynostosis poses unique challenges in management, as intervention is time sensitive. All management decisions should be made in conjunction with neurosurgery colleagues. For patients who present early and who are candidates for minimally invasive procedures, intervention is favored prior to 4 months of age; these patients are classified as Tier 2a (consider postponing) or Tier 3a

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Information presented is intended to educate the reader on the variety of guidance published by state governments regarding surgical procedures and should not be used as a substitute for each reader's respective local or state guidance. Given the rapidly evolving nature of the COVID-19 pandemic, official guidance may have changed during data collection or by the time you are reading this.

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(do not postpone). However, postponing an intervention beyond 4 months of age may make these patients ineligible for minimally invasive approaches, thereby putting patients at higher risk of complication.[25,26] In such instances, surgical intervention may be considered prior to 4 months of age, based on institutional practices.

For patients who are outside of the window for minimally invasive procedures, intervention for open cranial vault remodeling remains time sensitive as patients who undergo the procedure over 12 months of age can have decreased rates of reossification and higher complication rates.[27,28] Based on the CMS classification, these patients are classified as Tier 2a; however, due to the risk of complications and decreased reossification rates, open cranial vault remodeling is ideally performed prior to 12 months of age. In situations where patients present with findings of elevated intracranial pressure, acute intervention is required and these patients are classified as Tier 3a; this intervention should not be postponed.

No state guidelines specifically mention craniosynostosis; however, 5 states mention that elective cases should only be postponed if they can safely be done so within a period of 30 days to 3 months.[21,23,29–31] As craniosynostosis cases are time sensitive, such considerations may apply.

FACIAL TRAUMA

Facial trauma encompasses a range of clinical scenarios, each with unique considerations. Many facial fractures are nonoperative and require no more than symptomatic management and precautions. For operative fractures, the risk for airway compromise, health of the patient, and acuity of intervention must be assessed; interventions for facial fractures range from Tier 1a for interventions based on cosmetic concerns and Tier 3a for highly symptomatic patients. Facial nerve repair for acute facial nerve injury after trauma is classified as Tier 3b and should not be postponed.

No state guidelines specifically mention facial trauma. However, Minnesota's recommendations specifically state that if there is "threat of permanent dysfunction of an extremity or organ system, including teeth and jaws" that such an intervention is considered nonelective.[20]

OTHER CRANIOFACIAL PROCEDURES

Craniofacial surgeons perform a variety of other procedures in their practice not specifically addressed above. Surgeons are advised to weigh the acuity of each procedure and health of the patient against the risk of SARS-CoV-2 exposure and impact on the health system. Most procedures will be low acuity in healthy patients (Tier 1a) and should be postponed.

Procedures involving excision of benign or malignant tumors should be carefully considered; national oncology organizations have recommended postponing oncologic resection procedures for cancers that are at low risk for progression or metastases; the length of postponement varies based on the individual guideline and health system resources.[32,33] Most oncologic resection procedures performed by craniofacial surgeons are for tumors with low risk of progression or metastasis; these are classified as 2a and postponement should be considered. However, those tumors with high risk of progression or metastasis are classified as Tier 3a (do not postpone).

Nine states specifically mention cancer in their guidelines; these guidelines make exceptions for cancer cases and cases in which there is a risk of metastasis or progression of staging of disease.[2,14,17,20,21,23,31,34,35]

CONCLUSION

Craniofacial surgeons must balance the risks of postponing a surgical procedure with the risk of exposure to the child and healthcare staff and risk of developmental delay against delaying the procedure during the COVID-19 outbreak. The CMS guidelines and state-specific guidelines provide guidance to craniofacial surgeons; however, the time-sensitive nature of many pediatric craniofacial interventions must be considered.

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