The changing perceptions of pediatric dental practice post COVID; The new normal

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Abstract

‘Normal’ isn’t coming back as the world after COVID-19 is unlikely to return to the world that was. Pediatric dentists have to be ready to accept a ‘new normal’: a new kind of society, a new relationship with their patients and a new experience of their profession. The future of dentistry in the post pandemic era will be faced with many challenges, some of them potentially multiplied, such as high quality infection control and a shift of focus to minimally invasive dental care. In such a situation the question is: What will be the return-to-practice roadmap for pediatric dentists post COVID-19? The aim of this article is to answer this question by providing an overview of the structural and functional challenges that pedodontists would face when the pandemic is behind them, and what changes would be required in the approach to providing dental care to children, so as to overcome these challenges. It also provides an insight into how we can gradually achieve our goal of re-establishing normal and keep our practice running by means of effective communication and planning.

Keywords: Changing perceptions, pediatric dental practice, COVID

Introduction

2020 registered the coronavirus disease 2019 (COVID-19) caused by the novel virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This escalated a global pandemic that was declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO) [1]. The first case of a dentist being confirmed with COVID-19 was reported on 23rd January 2020 at the Department of Preventive Dentistry in the Wuhan University Dental Hospital, China. Subsequently, the transmission of the disease to 8 other oral healthcare providers was reported [1, 2].

Aerosols being one of the primary routes of transmission of SARS-CoV-2, the Occupational Safety and Health Administration (OSHA) placed dental health care personnel (DHCP) at a very high risk of exposure as dentists work in close proximity to the patient’s oral cavity [3, 4]. Another reason why dentists, especially pediatric dentists are an elevated risk of exposure to the virus is because children with COVID-19 often present as asymptomatic, or with mild to moderate symptoms, similar to common cold.

In an analysis of 2000 children with COVID-19 in Hubei, China, over 90% were asymptomatic or with mild symptoms [5]. The reason why this virus is less likely to affect children than adults is because children have a more active innate immune response, a weaker ability to trigger an acute inflammatory response to SARS-CoV-2 and a healthier respiratory system that has not been exposed to as much cigarette smoke and air pollution as in case of adults [6]. Therefore, the true rate of COVID-19 infection in children is highly underestimated enabling them to play a pivotal role in community-based viral transmission.

In such a rapidly changing pandemic landscape, lifting restrictions would certainly not mean a return to normal. The question is what exactly would it mean for our dental practice. Opening doors to pediatric patients would mean adapting to a new normal, one that would continue evolving for weeks and months to come.
First steps - Greater emphasis on infection control and prevention of transmission of the virus
Stepping back into practice will require much greater emphasis on infection control, it will become inevitable to maintain a very high degree of suspicion by all dental professionals while strictly adopting the standard infection control protocol.

Creating a checklist
Prevention of transmission can be minimized by maintaining vigilance for all individuals entering the dental clinic and by developing a unique strategy for taking necessary precautions before, during and post treatment. A checklist should be created regarding infection control, education and training, administrative measures, correct hand hygiene technique, guidelines on use of personal protective equipment (PPE), respiratory hygiene/cough etiquette, sharps safety, sterilization and disinfection of patient-care instruments and devices and disinfection of the dental unit water quality [1, 7, 8].

Waiting area
Planning for contactless check-in.
Preferably, the patient/guardian should check in via tele communication thereby eliminating face-to-face interaction with the receptionist. If that isn’t feasible, then a plexiglass shield or similar barrier should be considered.

Updating sanitization protocols.
Rigorous sanitation should not only be confined to clinical instruments and spaces but should also be extended to the reception area, kids’ play room and public restrooms as well as any surfaces that multiple people may touch like doorknobs, counter tops, and other routinely contacted surfaces. Unnecessary items from the reception area such as magazines and books, display models, toys and swings in the kids’ area and even any extra furniture should be removed. Visual alert icons like signs and posters should be put up in strategic places to provide patients with instructions (in appropriate languages) about hand hygiene, respiratory hygiene, and cough etiquette as recommended by the Indian Dental Association (IDA) [3, 9].

Scheduling of appointments should be planned in such a way so that social distancing can be maintained in the waiting area or, the patient may be asked to wait outside in their vehicle. They can then be contacted via telephone when needed to be seen. The number of companions accompanying the patient must be limited. This must be conveyed to the parent/guardian at the time of scheduling an appointment [10].

Before providing treatment
Owing to the long incubation period (2-14 days) of the virus, and to the fact that children can be asymptomatic or present with mild, nonspecific symptoms, all pediatric patients and parents should be considered as potential carriers of SARS-CoV-2 [1] until the advent of a successful vaccine for the virus and its expedited delivery across the world. Henceforth, besides assessing the patient for symptoms of acute respiratory infections like cough, cold, sneezing etc, it is desirable to record the temperature of every individual before entering the waiting room using a non-contact thermometer gun. The patient history questionnaire should include travel history, as the COVID-19 pandemic may be smouldering in some parts of the world for the foreseeable future as well as a recent history of other relative common COVID-19 symptoms like diarrhoea and recent loss of taste and/or smell [11].
Routine wearing of face masks by the entire dental team including para-dental personnel and receptionists should be the norm until the foreseeable future. High quality personal protective equipment (PPE) including gown, gloves, head cover, shoe covers, a face shield and a face mask preferably an N95 respirator should be used by dental surgeon and dental assistant while treating patients [12].
Good hand hygiene is crucial to prevent the spread of infectious diseases. WHO recommends using an Alcohol-Based Hand Rub (ABHR) or water and soap, both being equally effective measures for disinfecting hands [13]. The dental surgeon and the dental assistant should wash their hands before examining a patient, before performing any dental procedures, after completing the procedure and after touching any any device, instrument or equipment in the dental office.

During treatment
Pre – procedural mouth rinse
This is one of the most efficient ways to decrease the load of microorganisms in oral aerosols. Preprocedural mouth rinse with 0.2% povidone-iodine or 0.12% chlorhexidine (CHX) or 0.05% cetlypyridinium chloride (CPC) is recommended. Although the viricidal activity of these mouth rinses against the novel corona virus is still uncertain, CHX has been found to be efficient against some viruses such as hepatitis B virus (HBV) and herpes simplex virus (HSV) [13, 14].

Radiographs
Though routinely used, intraoral X-ray examination can stimulate saliva secretion, gag reflex and coughing. Therefore, extraoral radiographic techniques such as panoramic radiography and cone beam computed tomography can be used as alternatives during and immediately after COVID-19 pandemic period [14]. However, if an intraoral radiograph is obligatory, then additional precautions such as the use of double barriers to prevent cross-contamination are recommended [15].

Rubber dam isolation
Increased use of rubber dam in the post COVID-19 era is recommended, especially during endodontic and restorative procedures in pediatric patients as it could significantly reduce the airborne particles in approximately 3 feet diameter of the operational field by about 70 % by reducing the amount of splatter production [9].

Reduction of aerosol production
Pediatric dentists should avoid using aerosol-generating devices to the best and emphasize on the use of hand instruments like spoon excavators and hand scalers for removal of carious soft tissue. Even if aerosol-generating procedures are to be performed, then they should be scheduled as the last appointment of the day [16]. 10 or 11 o’clock chair position is recommended while working. 8 o’clock position should be avoided in order to avoid splatter. Four-handed dentistry with high volume and regular suction for aerosols should be implemented [16]. Additional measures recommended to reduce cross infection due to aerosols include improving the quality of water, flushing of water from dental unit water lines, using antiretraction valves, antiretrieval handpieces, and retrograde aspiration [17].


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Shift from aerosol generating procedures (AGP) to minimally invasive dentistry (MID) – A futuristic approach in the post pandemic era

Post COVID-19 pediatric dentists are more likely to gravitate towards minimally invasive dentistry to minimise the generation of aerosols produced during elective dental procedures.

AGPs include the use of:
- High-speed handpieces
- Slow handpieces
- 3-in-1 syringes
- Ultrasonic scalers
- High-volume suction/aspirator \(^{[18]}\).

Minimal Intervention Dentistry (MID) is a biological approach to treat carious lesions, which covers a spectrum of techniques ranging from no carious tissue removal to selective carious tissue removal.\(^{[19]}\) Advantages of MID over AGPs are:
- Aims to control the progression of carious lesion by isolating the cariogenic bacteria from dental plaque.
- Provides a safe, decreased aerosol generating procedure with high-quality treatment approaches that are highly accepted by children \(^{[20]}\).
- Besides maintaining tooth structure and reducing the risk of pulp exposure, it requires less need for local anaesthetic, thus reducing the child’s discomfort, which contributes to more efficient behaviour management and thereby less production of aerosols that may otherwise be generated by the child while coughing, crying, screaming etc.
- Most of the mid procedures can be completed in a short period of time, therefore requiring a shorter follow up period and reduce the number of patients in waiting room waiting to be seen \(^{[21]}\).

These techniques involve pit and fissure sealants, resin infiltration, Silver Diammine Fluoride (SDF) application, the Hall Technique, Atraumatic Restorative Technique (ART), and selective removal of carious tissue. They are indicated in asymptomatic, cavitated or non-cavitated dentine carious lesions in primary and permanent teeth, in cases of molar incisor hypomineralization and in teeth with no clinical or radiographic signs of irreversible pulpitis, dental infection, pulp exposure or pathology \(^{[19, 20]}\).

New approach to behaviour management

Restless and crying children tend to spread more aerosol compared to calm children. Appropriate and skilful behaviour management techniques may be utilized to minimize SARS-CoV-2 cross infection.

Seeing a health care provider in a PPE may lead to added anxiety in a child and therefore it may be helpful to put this protective equipment on while the child is watching and while trying to explain to the child in simple language the value and the use of this equipment. Another alternative may be to have a pin/ sticker that can be easily disinfected, with the health providers photograph displayed, over the protective equipment \(^{[22]}\).

Additionally, non – pharmacological behaviour management techniques may have only limited role in the post pandemic era requiring a greater use of pharmacological behaviour management techniques. Nitrous oxide inhalation sedation can be offered as an alternative if non- pharmacological behavioural management techniques alone are insufficient \(^{[23]}\). The risk of transmission of COVID-19 associated with inhalation sedation is comparative low as it involves the use of disposable nasal hoods and tubing while enabling the child to remain calm and allowing the dentist to carry out the treatment as efficiently as possible \(^{[18]}\).

Post treatment

Human coronavirus may live up to 9 days at room temperature on an inert surface with a higher preference for humid climate. Clinical staff should disinfect inert surfaces after every patient, using chemicals confirmed against COVID-19 and keep a dry atmosphere to mitigate the 2019-nCoV spread. Such surface disinfectants include 0.5% hydrogen peroxide, 62–71% ethanol and 0.1% (1 g/L) sodium hypochlorite \(^{[13]}\). Waterlines should also be disinfected with 0.01% sodium hypochlorite on regular basis \(^{[24]}\). Thorough cleaning and proper sterilization of all reusable instruments and materials after every patient should become a routine practice in every dental setup especially in the times of this pandemic. All biomedical wastes pertaining to patient care should be carefully disposed from time to time in compliance with the requirements of medical waste disposal.

Decision Making and Triaging of dental patients

COVID-19 has had a devastating impact on the dental industry, and with the pandemic still on the growth curve, and it is difficult to ascertain the extent and severity of its long-term impact at this point of time. Hence, it may not be feasible to cater to all the dental problems of every patient in the immediate post-pandemic era. Therefore, decision has to be taken regarding what constitutes a dental emergency, and which patients require urgent dental care. This can be done by triaging patients by phone or by any other means of tele – health conferencing. Guidelines for recognizing dental emergencies, which are also applicable to pediatric patients have been provided by the American Dental Association (ADA) \(^{[25]}\). These guidelines however, may vary depending upon the progress of the pandemic in different countries and also for different regions within the same country. Eventually, it is the dentists in each dental office who are best positioned for taking the final decisions for that office regarding the best possible treatment that can be provided to a patient while minimizing any chances of cross-infection.

Tele dentistry – a pragmatic approach to deliver oral care in the post pandemic era

The new normal is that dental professionals need to limit patient contact, while still providing continuity of care for patients and keeping their practices running during a global pandemic. In such a scenario, tele dentistry provides a solution for our new coronavirus reality that may help us to solve the following purposes until the complete eradication of this virus:
- Telephone triaging of patients to verify their COVID-19 risk status and decide on the urgency of the dental condition.
- Offering patients with detailed home care instructions and any appropriate medications if treatment is to be delayed \(^{[22]}\).
- Treatment outcomes can be monitored and follow up can be maintained using mobile photography while ensuring patient confidentiality.
- Educational videos can be provided regarding the maintenance of oral hygiene for the benefit of the child.
- Maintaining social distancing in the best possible way and thereby eliminating any chance of exposure to the virus.
**Medically compromised and special needs children**

Dental pain may have a severely negative impact on medically compromised children and children with special needs and their families with a display of adverse, self-harming behaviours. Additionally, children with underlying systemic conditions (like any immunocompromised state, transplant patients, diabetic patients, children on immunosuppressants/steroids/chemotherapy) should be given special consideration due to the increased risk of developing complications arising from any subsequent infection if the tooth is not treated. Children who are at a significantly increased risk from COVID-19 like those with long term respiratory conditions, cystic fibrosis with significant respiratory problems, childhood interstitial lung disease, severe asthma, and respiratory complications of neurodisability should not attend a dental clinic unless the dental condition is considered ‘life-threatening’ [22, 26].

The AAPD (American Academy of Pediatric Dentistry) recommended that in order to re-start providing dental treatment to children with compromised immune illnesses or with complex medical care needs, protocols and referral sources should be prepared in accordance with hospital protocols and should be readily available. Consultation with the child’s physician about the safety of being seen in the dental office should be made and consideration should be given to hospital-based dental clinics if available [27].

**Reinforcing oral hygiene – ‘opportunity through adversity’**

It is true that the pandemic has alleviated the levels of anxiety in children of all age groups, but it has also enabled them to develop a stronger bond and a better understanding with their parents and family members. This bond developed during the lockdown can be utilized during the post pandemic period to motivate parents to reinforce optimal oral hygiene practices in their child. Since the schedules have changed for children, the usual routine of brushing twice a day may get hampered, as they aren’t spending blocks of time doing activities or waking up early to go to school, and are also staying up late. This is the time for parents to up their dental care game and educate children about the importance regular brushing and flossing to prevent any tooth decay. Parents may engage in games and activities with their children and transform their boring oral care routine into something more riveting. To make things more interesting flavoured toothpastes and multi-coloured tooth brushes may be used and the importance of maintaining oral hygiene can be explained using video demonstrations or mobile dental game applications for the same.

**Role of diet counselling**

The pandemic has had a profound psycho-physical impact on the health of children. With their set routine blighted, almost no engagement in any sort of physical activity and with nothing much to do at home, most children have directed their attention towards food. Unhealthy eating habits have seeped in like having larger number of extra meals as well as more amounts of sweet, sugary and processed foods and snacks than usual. These unhealthy dietary habits are a cause of worry as they have caused many children to become obese and lethargic and have also had an extremely negative impact on their oral health. These habits are most unlikely to change even in the immediate post pandemic period making it even more important to emphasize on the need of proper nutrition and a healthy diet.

Parents need to be educated about the role that a healthy diet can play in not only strengthening the immune system of their child but also preventing further occurrence of dental caries. A diverse diet with a colourful mix of fruits and vegetables as well as grains and proteins (beans, nuts, seeds, meat, chicken, fish, eggs) should be planned, keeping in view the preferences of the child [28]. It is important that parents make sure that their children drink enough water and limit the intake of excessively sugary, sticky and retentive foods. These can be replaced with suitable alternatives like freshly cut fruits, vegetable sandwiches, variety of nuts, fresh fruit juices instead of sodas and carbonated drinks etc. Children can be made to pick on their own from a variety of fruits and vegetables each day, engage in fun cooking activities with their parents and can be made an integral part of the decision making process. A healthy diet may prove to be the best choice for every child during the outbreak and beyond.

**Gradually re-establishing normal – effective communication and planning**

Effective communication with the entire dental team regarding who will be responsible for tasks such as patient intake, diagnosis, or different dental procedures as well as creating a planned timetable regarding who will work and on which days, while making sure that everyone understands that plan and knows their own responsibilities is key to avoiding chaos and gradually restabilising a thriving and growing practice. To keep the practice running, reputation management and trust building may gain even more weightage than ever in the post pandemic era. Patients and parents should be provided with accurate and current information. As dental office hours and available services change, website and social profiles should provide information explaining what safety precautions are being taken. It is important to maintain transparency regarding what procedures are temporarily unavailable and about the extended delays in appointment scheduling. Gradually increasing workload and relaxing restrictions on the number of clinicians in the dental office should be done only when it is acceptable by official guidelines and when the entire dental team feels confident and safe to do so.

**Conclusion**

The end of the pandemic will mark the beginning of new methods of approach to treatment in pediatric dentistry. To successfully reopen, and rebuild trust among pediatric patients and their parents, the emphasis needs to be on providing safe and quality care. It is important to stay positive and look for available alternatives. At present; closely adhering to all safety regulations, making optimal use of powerful tools like tele dentistry for effective communication, encouraging children to practice regular oral hygiene while taking a healthy diet and focusing on preventive and biological treatment modalities, will allow pediatric dentists to regain a strong foothold in their practice while enabling them to protect themselves and those whom they serve.

**References**


