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## PERSPECTIVE ARTICLE

### Telemedicine as an Alternative Way to Provide Multidisciplinary Cleft Care During the COVID-19 Pandemic

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#### Abstract:

The current coronavirus pandemic is changing the way healthcare professionals provide services to patients. Healthcare professionals are required to provide quality care while reducing the risk of viral transmission. This pandemic has disrupted the timely multidisciplinary team care for patients with clefts across the globe. Thus, telemedicine has been recognized and accepted by various medical and dental specialists as a viable alternative to face-to-face consultation. In addition, telemedicine incorporating a digital workflow in cleft management will further reduce the risk of viral transmission and enhance the quality of treatment being provided to these patients.

**Keywords:** Cleft lip, Cleft palate, Telemedicine, Multidisciplinary, COVID-19, Pandemic.

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## 1. INTRODUCTION

The COVID-19 pandemic has presented unprecedented challenges to healthcare systems around the world. The risk of infection is greater for healthcare professionals due to their close proximity to patients and is magnified in countries where there is a shortage of personal protective equipment [1, 2]. For example, a significant number of infections in China have occurred due to transmission in healthcare settings [2].

Patients with clefts are typically managed by a multidisciplinary team (MDT) of healthcare professionals [3]. These teams are composed of plastic surgeons, oral and maxillofacial surgeons, orthodontists, speech therapists, otolaryngologists, pediatric dental specialists, pediatricians and psychologists [4]. The MDT is required to manage various complications experienced by cleft patients. Due to the COVID-19 pandemic, having a large number of individuals in a confined space is prohibited to reduce the risk of viral transmission. This has led to disruptions in the care of patients with clefts [5]. In addition, COVID-19 has severely affected national and global travel [6]. COVID-19 has posed an obstacle to providing quality MDT care to cleft patients.

Healthcare authorities have advised healthcare professionals to use the current technology to provide comprehensive care [7]. One of the technologies being widely

used is telemedicine [8 - 10]. The objective of this article is to provide perspectives on MDT care for patients with clefts and on how telemedicine can offer an alternative for the delivery of treatment during the pandemic.

## 2. TELEMEDICINE

Telemedicine refers to the provision of healthcare services through electronic telecommunications [9]. Due to the pandemic and social distancing guidelines, more healthcare professionals have begun to use telemedicine to reduce the risk of spreading the virus [8, 11]. For instance, by adopting telemedicine, China has managed to reduce the transmission of COVID-19 to healthcare workers [12]. The implementation of telemedicine is not a new concept. Several countries, such as Australia and the United States, have seen the incorporation of telemedicine as an invaluable tool for improving access to healthcare within large geographic areas [13 - 15].

Clinical specialties involved in cleft care such as plastic surgery, otorhinolaryngology (ORL), and dentistry are gradually adopting this technology into their daily practice [10, 13, 16 - 21]. Plastic surgeons have used telemedicine in acute and chronic cases for consultation, review, and monitoring of wounds [18, 19, 22 - 24]. In the field of ORL, 62% of cases can be successfully addressed using telemedicine [20]. Furthermore, the transmission of high-quality images of laryngoscopy and videostroboscopy to an off-site laryngologist for remote evaluation of the voices and real-time diagnostic communication has been successfully accomplished [25].

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One of the other branches of telemedicine is teledentistry [13, 16]. The term “teledentistry” was first introduced in the year 1997 by Cook and was defined as “the practice of using videoconferencing technologies to diagnose and provide advice about treatment over distance” [26]. However, teledentistry is not limited to videoconferencing. It also incorporates the use of electronic medical records, video, and three-dimensional digital images to facilitate dental services delivery [27].

### 3. MULTIDISCIPLINARY CLEFT CARE

Collaboration of a team of experts from multiple health disciplines is essential for providing comprehensive care to patients with clefts [3]. The standard team structure, consultation processes, and use of telemedicine differ across sites and countries. For example, in Malaysia and certain countries, depending on the healthcare institution, an average of 5-15 health professionals may attend multidisciplinary combined clinics [28, 29]. The number of patients typically seen on a consultation day varies from week to week. The consultation room is occupied by the patient, his or her parents, and healthcare professionals. During a typical consultation, the patient’s physician presents the case history to the other team members. The patient is then clinically examined by the team members as relevant to their specific discipline. Next, the MDT explains the treatment plan for the patient while a designated person takes notes on the discussion. There is no definite time frame for a consultation; the time spent on each consultation is determined by the complexity of the individual case.

A multidisciplinary team of healthcare professionals is more essential in Low- and middle-income countries (LMIC) [30]. In LMIC, due to limited resources, local MDTs may not be available and few healthcare professionals have the necessary experience to manage patients with clefts. These LMIC mostly rely on foreign assistance to provide MDT care [31]. There are a few methods available to develop a MDT in a LMIC. One of these methods is to provide training to local healthcare professionals through a clinical collaboration initiative in a well-established cleft center in a developing nation. The rationale behind providing this type of training is to allow the healthcare professionals in the developing nations to continue providing care to their patients while also training other healthcare professionals. The second method is where a MDT of cleft specialists from a developed nation travels to a LMIC to provide the necessary care. For foreign professionals to provide optimal care, they are encouraged to visit the LMIC regularly over a long period of time, with the goal of educating the local healthcare professionals.

### 4. COVID-19: MULTIDISCIPLINARY CLEFT CARE

Currently, the COVID-19 pandemic is wreaking havoc on the healthcare systems of many countries. Due to a rapid spike in global COVID-19 cases, certain countries have postponed elective surgeries due to the diversion of available resources to combat the pandemic [32]. Naturally, cleft surgeries are not exceptions to this postponement. This has posed significant challenges to providing high-quality care to patients with clefts during this unprecedented time. One of the main challenges is deciding how to provide a safe environment for both the patients with clefts and the healthcare providers [33].

Clefts are best managed by a MDT of clinicians; however, due to a large number of health care providers involved in each session and safety concerns, this practice is not advisable under the current circumstances. This practice would also require the use of more Personal Protective Equipment (PPE), which is currently in short supply. The scarcity of proper PPE would result in an increased risk of spreading COVID-19 from patients to healthcare providers.

Due to the multidisciplinary nature of cleft care, treatment is primarily provided in centers located in the main cities. Therefore, patients in rural areas might be required to travel a great distance to attend a multidisciplinary consultation clinic. In addition, the COVID-19 pandemic has led governments to restrict intrastate and out-of-state travel to curb the spread of the coronavirus [6]. These restrictions might prevent patients from traveling to attend MDT consultations. The COVID-19 pandemic crisis is global and has impacted many nations. This is even truer in LMIC, where the primary care for patients with clefts is primarily provided by overseas missionary teams of healthcare professionals [34, 35].

### 5. TELEMEDICINE IN PROVIDING MULTIDISCIPLINARY CLEFT CARE

To reduce the risk of COVID-19 transmission, MDTs of cleft clinicians can replace the pre-existing method of consultation with telemedicine. One method of adapting telemedicine for MDT care is to reconfigure the pre-existing consultation room into a telemedicine-designated room. In such a scenario, one person is assigned to be in the consultation room and then streams the live feed to the other team members outside of the consultation room. These members will enter the room only when the team deems it essential for that team member to physically examine the patient. This method reduces the number of individuals in the consultation room and limits the usage of PPE and the risk of viral transmission.

A second method is to provide telemedicine to patients in their homes [36]. This would reduce the risk of spreading COVID-19 from healthcare providers to patients and vice versa. This method is suitable for less complex consultations or for follow-up visits. A potential disadvantage of this method is that the patient is responsible for providing the live feed during the teleconference. Thus, the quality of the live feed will depend upon a number of logistical factors, such as internet connection, video camera quality, and microphone clarity. These factors are highly dependent on the socioeconomic status, the patient’s location, and the technology expertise of the parents or the patients themselves [35]. One method to overcome this is to have the patient attend a well-equipped telemedicine or teledentistry primary care clinic near their home and then connect the system from the primary care clinic to the MDT team on another site. Telemedicine and teledentistry have been used for specialist case referral in certain countries [37, 38].

For LMIC, telemedicine can be a valuable tool for providing MDT care during the pandemic [34, 35] because it can overcome the international travel restrictions that are currently in place. In addition, telemedicine can be used to provide continuing health education to healthcare workers in

LMIC [39]. Hughes *et al.* [34] studied the reliability of remote digital video evaluations in the context of preoperative diagnosis. They concluded such assessments are indeed reliable for preoperative diagnosis of cleft lip and palate in the context of short-term plastic surgery interventions in LMIC.

In the same vein, Whitehead *et al.* [40] performed a study to compare the speech and language evaluations of cleft patients performed in person to assessments via teleconferencing. No statistically different speech or language parameters were found between the two methods, suggesting that evaluation *via* telemedicine is as effective as in-person speech evaluation. Similar research studies on speech and language therapy using telemedicine in Mexico and Nicaragua have also been published [23, 31]. To the credit of telemedicine, results from these studies have reported positive experiences from both patients' and clinicians' perspectives.

Furthermore, clinical support for nasopalveolar molding [NAM] care could also be provided to patients and parents by telemedicine during the COVID-19 pandemic [11, 41]. The adoption of telemedicine has reduced the number of in-person consultation visits required and limited face-to-face visits to situations when telemedicine is unable to resolve the clinical problem [11, 42]. Telemedicine also allows additional video-based conversations with patients and parents to review key information and steps prior to consultations. Clearly, this approach would minimize the risk of COVID-19 transmission.

## 6. DISCUSSION

The benefits of telemedicine are not limited to providing multidisciplinary care to children with cleft. Another benefit is in health promotion. One such example is the Young Doctor Project (YDP) in Brazil, the aim of which is to improve public awareness regarding cleft by the use of telehealth and interactive tele-education instruments [43 - 45]. This program granted participant access to the YDP website, which provides interactive tele-education about the definition, embryology, etiology, diagnostics, and treatment of cleft. In addition, more specific education on speech language pathology, audiology, and dentistry is also made available on this site. As a result of these efforts, the program reported significant increases in participant knowledge regarding cleft lip and palate.

The second benefit of telemedicine comes from incorporating a digital workflow into the management of children with cleft because digital workflow has been used in the fabrication of NAM appliances for children with cleft [41, 46, 47]. Traditionally, the construction method of NAM is to take a manual impression and then manufacture the device on a plaster model. The use of NAM requires the manufacture of multiple sequential appliances, hence the child is required to attend multiple clinical visits to have repeated impressions taken. Currently, this method may result in an elevated risk of spreading COVID-19, increasing the burdens of care, time, and cost of treatment.

The new digital technology can overcome many disadvantages of the previous method, in part by using a 3D intraoral scanner [46, 48]. This scanner is used to take a digital impression of the cleft defect and then create a digital model. The clinician can then share the digital model with the dental

laboratory technician or with other cleft clinicians by simply sending an email. As in the fabrication of clear aligners, the clinician can plan the movement of the cleft segments digitally and create sequential digital models for the fabrication of NAM appliances [49, 50]. If the clinician possesses a 3D printer, the appliance can be constructed in-house within a day [51 - 54]. In addition, studies have reported that the digital fabrication of NAM appliances is more precise than the traditional method.

Furthermore, the implementation of 3D intraoral scanning, planning, and printing will provide great value to the cleft clinician by reducing the number of clinical visits, thereby reducing both contact with patients and PPE usage [41]. From the patient's point of view, these digital methods will enhance the quality of care and reduce the time and burden of care for the fabrication of NAM appliances.

## CONCLUSION

Telemedicine has proved to be an effective way to provide MDT care to patients with clefts during the COVID-19 pandemic. Although face-to-face consultation is the traditional way of providing comprehensive cleft care, the development of an unprecedented pandemic has encouraged healthcare global professionals to find an alternative way to achieve the same goal for patients with clefts in a safe and cost-effective manner. The adaptation to a digital workflow in daily clinical practice during the pandemic can facilitate social distancing, increase the quality of care being provided, and perhaps become the norm even after the pandemic.

## CONSENT FOR PUBLICATION

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest, financial or otherwise.

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