

# Modifications in the practice of oral surgery to combat COVID-19 with the reopening of the clinics

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## ABSTRACT

The rapidly spreading outbreak of Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome corona virus 2 (COVID-19) has changed our life dramatically. Due to absence of effective vaccine and effective antiviral therapy, supportive care is provided to those patients with severe symptoms and the use physical quarantine and (social distancing) for preventing the spread. Implementing the measures of social distancing to prevent transmission of COVID-19 has been disruptive to our daily activities, patient care, business operations and to didactic activities. The

routes of transmission of SARS-CoV-2 may be direct through droplets and saliva, and contact transmission with oral nasal and eye mucous membrane. Modifications to practice of oral and maxillofacial surgery are mandatory to combat the transmission of the disease between health care personnel in maxillofacial department and their patients. Materials and methods: Website search (Pubmed, PMC) using the key words COVID-19; SARS CoV-2; oral and maxillofacial surgery; oral surgery. The aim of this study is to review some of the modifications in oral surgery practice as we move from the current situation of stringent physical and social distancing rules to phased clinical care during this pandemic.

**Key Words:** *Coronavirus; COVID-19; SARS CoV-2; Maxillofacial Surgery; Oral Surgery*

## INTRODUCTION

The rapidly spreading outbreak of Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (COVID-19) has changed our life dramatically. In December 2019 the news revealed a pneumonia focus of unknown cause in the city of Wuhan, Hubei province, China, which has changed the world [1]. The clinical manifestations of COVID-19 include fever, cough, and dyspnea up to respiratory failure which can lead to death [2]. In the absence of specific effective treatment, the clinical management is primarily symptomatic but severe cases require respiratory assistance with organ support in intensive care units for severely ill patients. The majority of these patients are old age and suffer from comorbidities. The world health organization declared COVID-19 a pandemic on March 12, 2020 [3].

Due to the absence of an effective vaccine and effective antiviral therapy, supportive care is provided to those patients with severe symptoms and the use of physical quarantine and (social distancing) for preventing the spread. Implementing the measures of social distancing to prevent the transmission of COVID-19 has been disruptive to our daily activities, patient care, business operations and didactic activities. The world health organization has concerns that relaxing the social distancing arrangements too early can lead to the second wave of COVID-19 cases extending the suffering and adverse effects on social and economic aspects in the long term. The routes of transmission of SARS-CoV-2 may be direct through droplets and saliva, and contact transmission with oral nasal and eye mucous membranes. Faecal-oral could be a route of transmission of the virus [4].

Now with the move to relax the stringent physical distancing guidelines and the return to clinical care activities, several doubts remain. Regrettably, SARS-CoV-2 is a novel virus and many gaps exist in the understanding of its behaviour. The exact rate of fatality is uncertain due to incomplete information on actual numbers of cases, the time of infectiousness following the onset of symptoms, the large numbers of presymptomatic and asymptomatic infectious patients, the duration of infectious period and the accuracy of rapid diagnostic tests to determine whether a patient has COVID-19 [5].

Second, almost all surgical and nonsurgical procedures carries a high

risk to health care personnel (HCP). Despite the fact that the challenges and uncertainties will be cleared as the data regarding the virus and the disease will improve, the health care personnel have some apprehension and reservations regarding the delivery of care in such an environment.

Transmission of infection among healthcare personnel has been documented, and the risk of transmission of infection between healthcare personnel and patients is higher due to the characteristics of procedures performed in oral surgery [6, 7].

The aim of this report is to review some of the modifications in oral surgery practice as we move from the current situation of stringent physical and social distancing rules to phased clinical care during this pandemic.

## MATERIALS AND METHODS

Website search (Pubmed, PMC) using the keywords COVID-19; SARS CoV-2; oral and maxillofacial surgery; oral surgery.

### Categories Of Surgical Procedures In Oral Surgery Outpatient

A shortage of resources is expected during the COVID-19 outbreak because the resources would be directed to the management of critically ill COVID-19 patients. The scarcity of resources enforces the postponement of elective surgery to reduce the load on the health care system. It is important to have clear guidelines for prioritizing the procedures in oral and maxillofacial surgery (Table 1).

The decision to perform surgery depends on medical and logistical considerations. Plans to facilitate the return to normal conditions to provide full health care to patients should be made as early as possible, COVID-19 should no longer hinder the provision of comprehensive patient care and elective surgical procedures is not an exception, changes to infrastructure should be instituted to allow the implementation of the new requirements.

### Protection Of Health Care Personnel (HCP) In Clinics Of Oral And Maxillofacial Surgery

No substantial changes had been introduced to personal protective

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**TABLE 1**  
**Categories of surgical procedures in oral surgery outpatient**

Postponable procedures	Pathologies responsive to medical therapy	Urgencies and pathologies unresponsive to medical therapy ( treatment after diagnostic test)	Emergencies (need for immediate treatment)
Periodic examination and recall visits	Osteonecrosis of the jaw	Abscess or localized bacterial infection	Diffuse soft tissue infection with intraoral or extraoral swelling that potentially compromises the patient's airway
Extraction of asymptomatic teeth	Pericoronitis or third-molar pain	Biopsy of abnormal tissue	Uncontrolled bleeding
Implantology	Surgical postoperative osteitis	Dental trauma with avulsion/ luxation ONJ unresponsive to medical therapy Pericoronitis or third-molar pain resistant to medical therapy Surgical postoperative osteitis (resistant to medical therapy)	
		Removal of non-absorbable sutures	

equipment guidelines which were established since the epidemic of HIV/AIDs on the presumption that all patients were an infection risk and acting accordingly. Because the novel coronavirus pneumonia is mainly transmitted through respiratory droplets and contact transmission, HCP should follow the standard precautions including personal protection, environmental management, hospital waste management cleaning and disinfection of objects so as to reduce the risk of hospital-acquired infection [8,9].

**The standard precautions are divided into**

**General protection:** wearing work clothes, disposable surgical masks, wearing latex gloves when necessary.

**First level protection:** wearing work clothes, disposable work caps, disposable surgical masks, disposable isolation clothes and disposable latex gloves.

**Second level protection:** wearing a disposable working cap, medical protective mask (N95), protective glasses, protective clothing or protective screen, disposable protective clothing or disposable impermeable isolation clothing, disposable latex gloves, and disposable shoe covers if necessary.

**Third level protection:** On the basis of second level protection using a full face shield, full face respirator or positive pressure head cover. The oral and maxillofacial medical staff should choose the appropriate personal protection according to different exposure risks. Oral and maxillofacial surgeons, like other specialists in otolaryngology, ophthalmology, and plastic surgery working in the head-neck region and the ancillary staff working in these settings, have a high risk of exposure to the novel SARS-CoV2[10,11].

Although the mode of transmission of SARS and COVID-19 are by droplets, it is apparent that the infectivity and extent of spread of COVID-19 will far exceed that of SARS [12]. The onset and duration of viral shedding and the infectious period relative to onset of symptoms are still not well understood for SARS-CoV2. In a recent study by Wolfel et al [13], the greatest amounts of viral shedding from the upper respiratory tract were during the first 5 days as symptoms were developing. In addition, live virus was isolated from 83% of the sputum samples but rarely (17%) from throat swabs in the first 8 days [13]. The proportion of case fatalities among HCP during the SARS-CoV and MERS-CoV epidemics was 12% and 7%, respectively [14]. In the United States, from February 12 to April 9, 2020, of the 315,531 COVID-19 cases reported to the CDC, 9282 (3%) were identified as occurring in HCP. Most HCP with COVID-19 (6760; 90%) were not hospitalized. Severe outcomes, including 27 deaths, occurred across all age groups, although death frequently occurred in HCP aged 65 years or older. Regardless of whether HCP acquires the infection at work or in the community, it is necessary to protect the health and safety of this essential national workforce. If HCP has been exposed to a patient with COVID-19 or a patient suspected to have COVID-19, the recommended data collection forms available should be used to assess the healthcare worker's risk of exposure and, any breaches in infection prevention and control policies. The World Health Organization stresses the importance of direct face-to-face communication with HCP in a blame-free environment. A daily self-check method should be established for all HCP.

**INFECTION AND PREVENTION CONTROL (IPC)**

The guidelines for infection control should be clear, concise, and clinically applicable. These guidelines must follow international criteria. Until a vaccine is available, the options for infection control include basic

handwashing and decontamination, the proper use of PPE, administrative controls to adjust staffing schedules to maintain the minimum number of staff working, and the use of engineering controls to eliminate aerosols and droplets in the air [15]. It is equally important to monitor these policies and to define indicators that will help to track the performance of HCP to maintain an effective IPC plan.

**Environmental modifications**

**Ventilation:** All waiting areas should be well ventilated with distance and space between patients and appointments to minimize waiting times.

**Filtration:** To increase the effective air change per hour and to reduce the risk to patients entering the room without respiratory protection Filtration Portable fan devices with high-efficiency particulate air (HEPA) filtration. It involves establishing a high ventilation rate, negative-pressure, inner isolation zone that sits within a (clean)larger ventilated zone.

**UV Germicidal Irradiation:** Due to a shortage in PPE interventions such as UVGI (UV GERMICIDAL IRRADIATION) in high-risk areas such as emergency rooms, intensive care units (ICUs), and procedure rooms, these interventions could be cost-effective and have high yielding.

**Pressurization:** Pressurization of side-by-side rooms with a pressure differential—positive pressure (ideally,>+2.5 Pa to 8 Pa) in 1 room and negative pressure (>-2.5 Pa) in the next room can be used to treat patients with airborne infections.

The times required for airborne contaminant removal from a room with 12 cycles of air changes/hour with 99% and 99.9% efficiency are 23 minutes and 35 minutes, respectively.

**SURFACE DECONTAMINATION**

When selecting a disinfection product, the effective ingredient, surface type, contact time, and type of clinical setting should be considered. Coronaviruses are a subgroup of enveloped, single-stranded RNA viruses. Studies have shown that SARS-CoV is sensitive to ultraviolet rays and heat at 56C° for 30 minutes, in addition to ether, 75% ethanol, chlorine-containing disinfectant, peracetic acid, chloroform, and other fatty solvents, but not chlorhexidine.

**Assessment of patients in outpatient settings**

We will be able to continue to perform some consultations for orthographic surgery, Obstructive Sleep Apnea (OSA), and dentoalveolar surgery via telephone- or video-assisted visits and choose to have in-person interactions during the pre-and postoperative period to decrease the risk of exposure and improve the workflow efficiency. During a preoperative planning visit, all attempts should be made to avoid the use of molded impressions and any intraoral imaging procedures that can lead to coughing and/or gagging and the generation of aerosol or droplets that will pose a risk to the staff. Additionally, cone-beam computed tomography and virtual surgical planning will become an essential part of the workflow, if these have not already been incorporated as a standard part of the present workflow.

**Inpatient care**

During the COVID-19 pandemic, all patients who are admitted to an inpatient unit should undergo a test for SARS-CoV-2 on a routine basis. Until a negative result is obtained, the new patient should be separated from other patients and instructed to wear a surgical mask and practice appropriate hand hygiene. Early identification and isolation of patients infected with SARS-

CoV-2 are the main measures to prevent virus transmission. It is obvious that, on the ward, infected and noninfected patients should be separated. Temperature monitoring should be conducted twice a day for all patients, and no visitors should be allowed. Patients should be encouraged to bring their electronic communication devices to keep in contact with relatives and friends. The health care personnel must use PPE depending on the risk of infection and type of activity. For routine care of low-risk patients who do not show symptoms of COVID-19, the use of a medical mask and gloves to protect against droplet transmission is sufficient.

#### Precautions in the operating room

Before taking a patient to the operating room, a test for SARSCoV-2 should be performed. An emergency patient that leaves no time for testing should be treated as being infective. For patients being infected with SARS-CoV-2, some special requirements have to be met in the operating room. They should wear an FFP2 respirator without a valve and a gown when they are brought to the operating room. The staff that is responsible for the transfer needs to wear an FFP2 respirator with valve, as well as a gown and gloves.

In the operating room, negative pressure must be established with the aim to reduce the dissemination of the virus. Before entering the operating room, every staff member needs to put on personal protective equipment. Besides an FFP3 respirator, it is also important to wear a face shield. The surgical team should not be present in the operating room during intubation as well as extubation. At any time, the number of staff members in the operating room should be minimal. The personal protective equipment of the surgical team should be completed by a water-tight sterile gown.

Whenever possible an experienced team should perform the surgery. If an extraoral approach is a relevant alternative to an intraoral one, it should be preferred. Reducing aerosol formation to a minimum should be a priority. Excessive water cooling for handpieces, saws, ultrasonic devices, and piezoelectric devices should be avoided. Instead of drilling screw holes, self-drilling screws should be used. The use of osteotomes should be considered wherever possible. Electric cautery should be avoided or performed with the lowest power possible and a smoke evacuation system. During the procedure, leaving or entering the operating room should be limited to a minimum. A time interval of 15 min must pass after the patient has left the operating room before cleaning and disinfection can start. Also, waste management must follow well-defined.

#### CONCLUSION

To conclude, the challenges we face will continue in the near future, maybe up to the next 12 months to 24 months. The positive side effects of the COVID-19 pandemic are that it has opened our minds and encouraged us to mobilize and enter into a new and possibly more efficient healthcare delivery model through telemedicine, virtual collaboration, and digital technologies. The introduction of digital technologies could have a high impact on healthcare delivery if incorporated into our daily workflow. Prioritizing surgery will require objective methods and good clinical and ethical judgment on the part of the surgeon. Our experience with the COVID-19 global pandemic has exposed the deficiencies of our healthcare systems. OMS professionals and leaders have a golden chance to work with the community, institutional, and professional leadership to implement care standards that address some of the deficiencies that have been recognized in our current healthcare system. High-quality care that is appropriate, accessible, and economically feasible, delivered with pride and in a transparent fashion, is believed to be much closer to reality than it ever has been.

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