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RESEARCH ARTICLE

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IMPACT OF COVID-19 ON IMPRESSION TAKING AND DIGITAL SCANNING PROCEDURES

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ABSTRACT

After the pandemic caused by the new Corona virus, protective measures were proposed to avoid dissemination of COVID-19 disease. Many services of public attendance need to change protocol to guarantee protection of users and service providers. With the high rate of contagion and the possibility of asymptomatic carriers around, COVID-19 presents dental professions with a high risk of infection. Biosafety measures must be meticulously carried out, from the time patients make their appointments until they leave the clinic. The recommendations provided in this letter are important for the attendance of urgent and elective cases, irrespective of when the pandemic ends.

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INTRODUCTION

After the pandemic caused by the new Corona virus (SARS-Co V-2) was declared, protective measures such as constant hand-washing, use of alcohol gel, facial masks, and avoiding conglomerations were proposed to avoid dissemination of COVID-19 disease (Organização Mundial da Saúde, 2020). Many services of public attendance such as dental clinics need to change protocol to guarantee protection of both users and service providers, since the transmission of COVID-19 is high via contact with saliva droplets. Assuming that every patient is a probable carrier and every surface touched is potentially contaminated is fundamental and should therefore be disinfected with the utmost care (Mendel, 2020). SARS-CoV2 has been identified in the saliva of contaminated individuals (To et al., 2020), and therefore, dental professionals and technicians may become potential carriers of this virus, or be affected by the disease. Therefore, dental clinicians may expose patients to cross-contamination, and it is necessary to adopt highly cautious measures of prevention and control, such as disinfection of the environment and surfaces, and personal protective equipment protocols [to shield healthcare workers] (Ather et al., 2020). Viral transmission at short distance may occur from larger saliva droplets, but also at long distance by smaller droplets contaminated with viral particles, which remain suspended in the air, arising from aerosols generated during clinical dental procedures.

Droplets and aerosols may remain in the air for long periods before they settle on surfaces or enter the respiratory tract (Mendel, 2020; Silva et al., 2020; Peng et al., 2020; Chandy et al., 2020; Ge et al., 2020). Saliva may represent a crucial role in transmission of the new Corona virus, and in cases of the professionals involved in attendance, and are in intimate contact with the patient's mouth, care is of extreme relevance (Ather et al., 2020; Silva et al., 2020; Peng et al., 2020). Biosafety measures must be meticulously carried out, right from the time the patients make their appointments for the procedures, through to the time they leave the clinic.

General Attendance Protocol

Initially, triage is recommended, by some means of communication, to assure that the patient has no flu or respiratory symptoms, such as shortage of breath, at the actual time or during the previous 14 days. International travels, contact with persons who have undertaken international travels, contact with persons who showed any symptoms whatever during the previous 14 days are also important questions to ask (Ather et al., 2020; Peng et al., 2020; Meng et al., 2020). Patients over 60 years of age, or those with suspected or confirmed COVID-19 must not be treated in a routine dental office, other than in cases of urgency (Ather et al., 2020; Peng et al., 2020). As soon as patients enter the clinic, the temperature of each patient must be taken with a frontal thermometer, without contact with the skin, and be under 37.3 degrees (Peng et al., 2020).

Table 1. Main Impression Materials and their disinfection for control of COVID-19

Impression Materials	Addition Silicone	Condensation Silicone	Polyether	Alginate
Disinfection	1) 2% Chlorhexidine 2) Steam autoclaving	1) 2% Chlorhexidine 2) Steam autoclaving	1) 2% Chlorhexidine 2) Steam autoclaving	- 0,5% Sodium Hypochlorite
Manner and Time of Application	1) Application in spray (5 times successively) and kept in plastic bag for 10 to 15 minutes 2) Underwent a standard autoclave cycle at 134°C for 30 minutes.	1) Application in spray (5 times successively) and kept in plastic bag for 10 to 15 minutes 2) Underwent a standard autoclave cycle at 134°C for 30 minutes.	1) Application in spray (5 times successively) and kept in plastic bag for 10 to 15 minutes 2) Underwent a standard autoclave cycle at 134°C for 30 minutes.	Immersion for 15 min.
Washing	1) Running water for 30s at 15 cm distance from the professional	1) Running water for 30s at 15 cm distance from the professional	1) Running water for 30s at 15 cm distance from the professional	Running water for 1 min.
Drying	1) Compressed air for 20 sec. at 15 cm distance from the professional	1) Compressed air for 20 sec. at 15 cm distance from the professional	1) Compressed air for 20 sec. at 15 cm distance from the professional	Compressed Air
Distortion	1) None 2) Minimal	1) None 2) Minimal	1) None 2) Minimal	Minimal

In the event of more than one patient being in the waiting room, a distance of a minimum of 1.5 meters between them must be guaranteed, by means of marks on the chairs (Ge *et al.*, 2020). We recommend that appointments must be spaced with a minimum period of 30 minutes between one patient and the next, to allow disinfection in cases of procedures without the release of aerosol, such as consultations for assessment, clinical triage, prosthetic impression taking, digital scanning, among others. Whereas procedures performed with the use of high-speed pens, ultrasound or jets of bicarbonate of soda, for example, leave a high concentration of potentially infectious aerosols in the dental office environment, due to their aerodynamic characteristics. These may remain suspended in the air for a considerable length of time and be inhaled by other patients, or the dental team themselves (Ge *et al.*, 2020). The face mask must be used by every patient, and removed only at the time of receiving attendance. Patients must wash their hands or use 70% alcohol gel the minute they arrive at the clinic for attendance, and they must not touch objects, their face or their own clothes (Ather *et al.*, 2020). Any decorations must be removed from the waiting room, as well as newspapers, magazines, drinking fountains of the type requiring the patient's mouth to come close to the water outlet. Both professionals and patients must take extreme care during the time the attendance is in progress. Hand-washing continues to be the most important measure for control of infection, using the adequate technique to achieve complete antisepsis of the hands. The professional must wash hands before putting on the IPE, after the procedure, and after disinfecting the place of attendance (Mendel, 2020; Penget *et al.*, 2020).

The entire team must use Individual Protective Equipment (IPE), including masks N95/PFF2, gloves, protective goggles, face shields, waterproof caps (head covers) and/or disposable gowns (Mendel, 2020). Professionals are recommended to use SMS or TNT polypropylene isolation gowns that have material weight greater than or equal to 40g/m (Mendel, 2020), wear the waterproof disposable gown over this, and both must be of the type that have back closure with laces. After attending the patient, the waterproof gown must be cleaned with a 0.5% or 1% hypochlorite solution; the TNT gown must be discarded, and the gloves and waterproof gown kept for use when for performing heavy cleaning. We recommend the use of plastic film (PVC) for covering the reflectors, headrest and control of the dental chair. These items must be changed for every patient. Handles of doors and other locations that need to be touched can be used while wearing protective gloves. For disinfection of the dental chair and surfaces, 0.5% to 1% hypochlorite solution (spray) or peracetic acid may be used, after treating every patient (Ather *et al.*, 2020). The common areas, such as the floor, door handles, chairs, tables and bathrooms must be cleaned 4 times a day to reduce any risk of transmission (Chandy *et al.*, 2020). Before starting any dental attendance, we recommend administering 0.12% chlorhexidine

solution to the patient. The patient must not use the spittoon, but rather use a disposable cup. The impression material must be manipulated by professional assistant or the dentist him/herself, with the use of overgloves. The same applies to handling the computer in digital scanning of the oral cavity.

Impression taking and scanning procedures: care and disinfection: Impression taking and/or digital scanning are routinely performed in dental practice, and concern about disinfecting the molds as well as the tips of scanners has become an even more serious consideration with the appearance of COVID-19. Table 1 shows the main impression materials and recommendations for their disinfection within the protocol for the prevention of COVID-19 (Gothwalet *et al.*, 2019; Damajoet *et al.*, 2016). We suggest disinfection with 2.5% sodium hypochlorite and 0.2% peracetic acid as viable alternatives for disinfecting silicones and polyethers, without causing distortions. For the intraoral scanners, we recommend the use of plastic film (PVC), which must be changed after every patient. The tips must be disinfected with 70% alcohol (rubbed on for 30 seconds and repeat the process) or sterilization in autoclave of the covers of tips in the case of brands that have such tip covers. The use of overgloves by dentists is fundamental for handling the computer at the time of scanning. Every day, new information about COVID-19 appears, and it is important for health professionals to keep themselves informed in detail. With the high rate of contagion and the possibility of asymptomatic carriers around, COVID-19 presents dental professions with a high risk of infection, and consequently, their patients as well (Silva *et al.*, 2020). We must be aware that after the world-wide pandemic, we will be faced with a new *normal*. The recommendations provided in this letter are important for the attendance of both urgent and elective cases, irrespective of when the pandemic ends.

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