

Precautions and Recommendations for Dental Care During the COVID-19 Pandemic

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Abstract: The COVID-19 disease pandemic, caused by the new Coronavirus (SARS-CoV-2) that originated in Wuhan, China, is an international public health emergency. This disease represents a major challenge for all health professionals, including dentists and their staff. This moment has significantly changed the attendance and routine of dental offices, so there is a great need for information and the development of protocols for the guidance of professionals. This paper aims to systematize the recommendations for dentists' clinical practice on biosafety and the use of Personal Protective Equipment (PPE), seeking to optimize dental care during the COVID-19 pandemic.

Keywords: Biosafety, COVID-19, Dentistry.

INTRODUCTION

The acute respiratory disease caused by the new Coronavirus (SARS-CoV-2) ("Severe Acute Respiratory Syndrome Coronavirus 2") was identified for the first time in China, in the city of Wuhan, by observing the increase in the number of pneumonia with unknown etiology and the dissemination and expressive growth of the number of cases in other regions and countries in the world, the characteristics of the virus at that initial moment being unknown [1].

After the discovery of the microorganism responsible for this infection, a phylogenetic analysis related the origin of SARS-CoV-2 to the bat. The study mentioned that this virus correlates only to the specific SARS-type Coronavirus, present in the bat species *Rhinolophus Sinicus*, cataloged in 2015 in China [2].

The researches [3, 4] that study the manifestations of this disease are still recent and many are ongoing. So far, it is known that the clinical manifestations of this virus are heterogeneous, with a portion of asymptomatic patients, while another portion evolves with clinical conditions classified as mild / moderate or severe, according to the severity of the disease [1].

Most patients had fever and dry cough, while some also reported shortness of breath, fatigue and other atypical symptoms, such as muscle pain, confusion, headache, sore throat, diarrhea and vomiting [3, 4]. Among the patients who underwent chest computed

tomography, most had bilateral pneumonia, with ground-glass opacity and irregular bilateral shadows. These were the most common patterns [3].

The main contagion routes for SARS-CoV-2 are direct contact and droplet transmission. This transmission occurs mainly through coughing, sneezing and saliva projection. The distance and time period that the particles remain suspended in the air is determined by the particle size, settling speed, humidity and air flow in the environment [5].

The droplets are larger than 5µm (microns) and can reach up to 1.5 m (meters) away from the source patient, with a residence time that normally lasts a few seconds in the air. The aerosol particles are smaller than 5µm, and therefore reach several meters from the source patient, with a residence time that can last for hours, depending on the flow and intensity of the air flow in the place [6].

Some studies [7, 8] report that factors such as face-to-face proximity between dentists and patients, exposure to saliva and other fluids, the possibility of contact with blood, in addition to sharp, manual instruments or not, that may be contaminated; make the dentist and its team, some of the professionals most vulnerable to contamination by the new Coronavirus; making it necessary to take extra care in relation to the management of the patient, cleaning of the office and protection of the professional and the team.

Even with the social distance recommended by the World Health Organization (WHO) [1, 9], many patients need to seek dental care, which should not be indiscriminate during the pandemic, considering that

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the dentist and his team may be potential disseminators of the disease [5].

Therefore, dental care must be of urgency or emergency, in order to reduce the cross contamination of oral health professionals to the population. The ADA (American Dental Association) [10] listed the priority situations that should receive care during the pandemic:

Emergencies: situations that pose a risk of death.

- Uncontrolled oral bleeding;
- Cellulite or diffuse bacterial infections, with increased volume (edema) of intra-oral or extra-oral location, and potential risk of compromising the patient's airways;
- Trauma involving the bones of the face, with potential involvement of the patient's airways.

Urgencies: situations that determine priority for care, but do not offer risk of death.

- Acute odontogenic pain, due to inflammation of the pulp (pulpitis);
- Pericoronitis or pain related to infectious processes involving retained third molars;
- Postoperative alveolitis, control or local drug application;
- Suture removal;
- Abscesses (dental or periodontal) or bacterial infection, resulting in localized pain and edema;
- Dental fracture, resulting in pain or causing trauma to the oral soft tissue;
- Dental treatment required prior to critical medical procedure;
- Cementation or fixation of crowns or fixed prostheses if the provisional or definitive restoration is loose, lost, broken or causing pain and / or inflammation of the gums;
- Biopsy of abnormal changes in oral tissues;
- Adjustment, replacement or removal of the arch or orthodontic device that is ulcerating the oral mucosa;

- Finalization or exchange of intracanal medication with calcium hydroxide and effective sealing with material resistant to chewing for endodontic treatments already started, thus avoiding that the prognosis is unfavorable;
- Extensive cavities or restorations with problems that are causing pain; necrosis with pain and the presence of purulent discharge;
- Adjust, replace or remove the arch or orthodontic device that is ulcerating the oral mucosa;
- Oral mucositis with indication for treatment with laser therapy;
- Dental trauma with avulsion or dislocation.

The pandemic caused by the new Coronavirus is a time of emergency in public health worldwide due to the ease of transmission of the virus and its different manifestations [4, 7]. Due to the need for information and protocols for dental care, this study aims to systematize the recommendations for dentists' clinical practice, related to biosafety and the use of Personal Protective Equipment (PPE), seeking to optimize dental care during COVID-19 pandemic.

PROTOCOLS ADOPTED DURING DENTAL CARE IN COVID-19 TIMES

Biological risk is an intrinsic threat in the practice of dentistry, in which patients, auxiliary staff, dentists and all other employees in the health field can be exposed to contamination by different microorganisms [11, 12].

With the new Coronavirus pandemic, it is suspected that a large number of people are infected with SARS-CoV-2, but are asymptomatic. Therefore, it is suggested that all patients be treated as potential sources of virus transmission [7, 8]. Next, some protocols that should be adopted for the new reality of care in times of COVID-19 will be suggested.

Scheduling Dental Consultations via Telephone or Internet Contact

At this point, it is essential to know if the patient has flu-like symptoms and pass on all the information about the protocols to be followed during dental care. If any suggestive symptom of COVID-19 is detected, and the consultation is not classified as an urgency or emergency, it should be postponed for a period of up to fourteen days, and the patient should be directed to seek health care for medical evaluation [7].

Patient Reception at Dental Services

The waiting room must be sanitized frequently and magazines or other commonly used artifacts must be removed. Alcohol at a concentration of 62-71% [7] should be available for use by everyone: patients, companions and the health team. Patients should carry as few objects as possible, with the room equipped with luggage storage, as in the clinical room, they will not be able to enter carrying bags, cell phones or other objects. Educational information about COVID-19 and the protocols to be followed, must be exposed in a visible place and be easy to understand [7, 13].

The patient should be instructed to touch objects as little as possible. The service should provide pro feet and a surgical mask for use before and after the procedure; clarify about the respiratory label that consists of coughing using disposable tissues or sneezing on the elbow or arm region; encourage hand washing with running water and liquid soap, or rubbing with alcohol gel (62-71%); and guide the washing of the face prior to the dental procedure [14].

The measurement of body temperature should be carried out at the reception, using a digital forehead thermometer with infrared for distance measurement. Patients should not remain in the waiting room for a long time, which is why the importance of telephone contact and scheduling is important. In addition, older patients should go to the consultation alone. The presence of a companion should only be allowed in cases of extreme necessity [15]. The distance between the accents should be at least 1.5m (meters) [16, 17].

Vestments of the Dental Team

The use of PPE is intended to prevent infection by the healthcare team, as well as patients and the environment, by microorganisms present in fluids such as blood and oropharyngeal secretions. PPE are considered: gloves (for procedures or surgery), cap, waterproof apron or chemical and biological protective coveralls, face shield, mask, protective goggles and foot protector [12].

All this vestment is in common use by oral health professionals. However, in times of COVID-19, other precautions were added. For direct contact with the patient, the dentist and the oral health assistant must be wearing surgical pajamas and closed shoes; long-sleeved disposable waterproof apron; respirator type mask in the specifications: N95, N99, N100, PFF2 or PFF3; face shield; in addition to gloves, protective goggles and foot protector [7] (Figure 1).

Special care must be taken at the time of professional vestment and deparmentation. Professionals should look according to this sequence [7]: foot protector, apron, mask, protective goggles, cap, face shield and gloves (Figure 2).

The placement of the feet requires great care to avoid contamination of the hands. Hand washing and disinfection after handling this PPE is recommended, due to the risk of contamination by microorganisms present in the shoe.



Figure 1: Personal Protective Equipment (PPE) required for dental care in times of COVID - 19.



Figure 2: Sequence of vestment.

According to the literature [7, 13-15], the greatest risk of contamination occurs during deparmentation. Therefore, PPE must be removed in exactly that order: gloves, apron, foot protector, face shield, cap, protective goggless and mask [7] (Figure 3).

The patient must also receive adequate protection by PPE's [12], and must be protected by: cap, protective goggles, disposable bib and protector foot. In addition, some studies [7, 18] recommend the use prior to dental care of mouthwash with mouthwashes based

on 1% hydrogen peroxide and 0.2% aqueous povidine iodine solution to reduce viral load in the oral cavity. However, there is still no scientific evidence on the effectiveness of this measure [7].

Dental Consultation

A thorough anamnesis should be performed for early recognition and control of a possible suspected case (isolating a patient with suspected COVID-19). All patients should be considered as possible vectors for

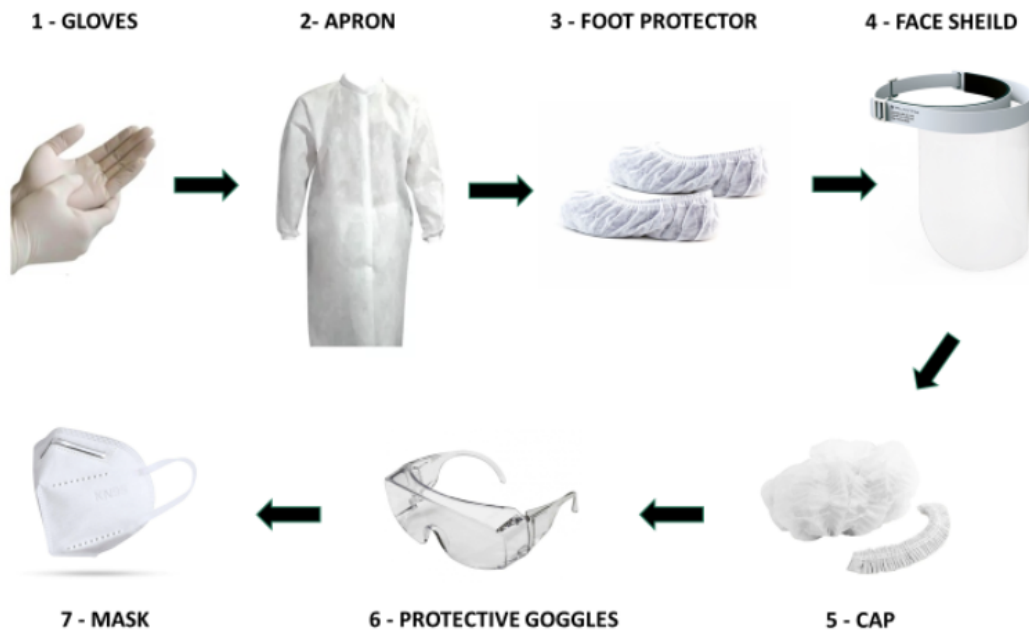


Figure 3: Desparation sequence.

the spread of the disease. Some questions can be suggested [10, 13-15]:

- If the patient has had a fever or experience a fever in the last 14 days;
- If he/she has experienced a recent onset of breathing problems such as coughing or breathing difficulty in the last 14 days;
- If he/she has had contact with people with confirmed Coronavirus infection in the last 14 days;
- If you have had contact with people with fever or breathing problems in the last 14 days;

In the case of affirmative answers, the ideal is to guide the patient to seek medical attention for the correct investigation of the clinical condition. In the case of negative responses, clinical care should be taken in order to prioritize urgent procedures [13, 14].

Clinical Dental Care

One of the greatest risks during dental care is the generation of aerosols from high, low rotation turbines and triple syringe [19]. For this reason, in addition to the team's PPE's, equipment, objects and surfaces must be surrounded by disposable barriers, such as PVC (Polyvinyl Chloride) films, to prevent the impregnation of contaminated particles [12].

Aerosol generation procedures should be minimized as much as possible, given that there is a possibility of dispersion of droplets and aerosols containing various pathogens, including Coronavirus [8, 9]. For the performance of procedures, all members of the dental team and patient, must be properly attired as described above.

According to some authors [18, 19], the clinical room must receive natural ventilation during and after the procedures; having to remain closed from one to three hours for the sedimentation of the aerosol particles on the surfaces, if there are no mechanisms for dispersing these particles. An alternative for environments without natural ventilation is the use of exhaust fans.

After this period, thorough cleaning of the entire environment (floor, walls, dental chair, countertops, platforms, tables, chairs and other objects) must be carried out with ethanol in a concentration of 62% to 71%; 0.1% sodium hypochlorite solution; or quaternary

ammonium. Other biocidal agents, such as 0.05-0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate, are less effective [7, 19].

The use of disposable barriers such as PVC film and TNT (non-woven) fields placed on surfaces and furniture facilitates the cleaning of the office, as these protect aerosol equipment, and should only be removed when disinfecting the equipment office [7, 12].

Disposal of contaminated materials, such as gloves and masks, must be carried out after each visit and packed in closed plastic bags identified as infectious; sharp perforations must be stored in containers suitable for disposal; all instruments, drills, cutters and low and high speed pens must be sterilized in an autoclave [12, 18].

Preoperative mouth rinsing, such as 1% Hydrogen Peroxide or 0.2% povidone-iodine, is recommended to reduce the number of microorganisms in the patient's oral cavity. However, there are divergences in the literature [7, 18] regarding the efficiency of the substances used. The studies are not conclusive.

As for radiographic exams, the periapical is the common technique in dental images; however, this method can stimulate secretion and cough, and saliva droplets and orofacial secretions may be projected. Therefore, extraoral radiographs and cone beam tomography are appropriate alternatives during the COVID-19 pandemic [10].

DISCUSSION

Cross infection is an imminent risk in dental clinical activity, and it is therefore essential that professionals strictly adopt disease prevention protocols. These conducts will be responsible for protecting the oral health team, patients, as well as dental care environments, reducing the risk of transmission of microorganisms and disease-causing agents [12].

"Precautionary Measures" are defined as a set of protocols that control infections. They must be adopted universally, as a way of reducing the risks of transmission of microorganisms in health services [12, 20].

Universal precautions are: use of barriers and PPE; prevention of exposure to bodily secretions and blood; accident prevention with sharps; proper management in cases of work accidents involving exposure to blood and organic fluids; adequate management during

decontamination procedures and handling of wastes and residues in health services [12].

All hygiene and biosafety measures were reinforced and supplemented due to the pandemic of the new Coronavirus. The high transmissibility and unpredictable behavior of COVID-19, put the entire world population on alert. The use of PPE has become a routine for all people, including the use of a mask, for those who are not health workers and who had to learn how to use this equipment in their daily lives.

The biosafety protocols presented in the literature [7, 13-16] often differ, mainly with regard to the efficiency or not of chemical substances on Coronavirus. Some articles [7, 18] recommend rinsing with mouthwashes based on 1% hydrogen peroxide and 0.2% povidine aqueous iodine solution, as a preventive measure for reducing viral load in the oral environment. However, there is no scientific evidence on the efficiency of these products.

In addition, Tuñas *et al.* [2] reported that mouthwash with 0.12% chlorhexidine solution, widely used in dentistry as a way of reducing microorganisms in the oral environment, is not effective in preventing COVID-19. However, further studies must be carried out to prove this statement.

Saliva is constantly excreted by the salivary glands, with this substance being renewed all the time in the oral cavity. Therefore, that saliva contaminated with microorganisms that "would be eliminated" by the antimicrobial mouthwash will be quickly replaced by excreting a new flow, with the arrival of more microorganisms that will contaminate the oral environment again. However, it is reaffirmed that more studies must be carried out for any suggestion or protocol to reach scientific proof.

Studies [6, 7] demonstrate that Coronavirus survives in environments for up to 3 hours in aerosols, with an estimated average of 1.1 hours. According to the researchers [8], the half-life for the virus on surfaces such as plastic and stainless steel is 6.8 hours and 5.6 hours, respectively. For this reason, the importance of isolating the clinical room for up to 3 hours after the procedure, if there is no means of dispersing the aerosol particles [19].

It is of fundamental importance to renew the air in the clinical environment, through the circulation of natural ventilation or the use of equipment that promote this renewal, such as exhaust fans. It also emphasizes

the periodic cleaning of air conditioning filters and technical assessments on cleaning pipes and air ducts in clinical environments [14].

In addition, the application of alcohol (62-71% concentration) on surfaces or skin, whether liquid or gel, will only be effective in eliminating microorganisms if the product is rubbed for about half a minute or more. This is the time required for the disintegration of viruses and microorganisms present on surfaces, which will only be eliminated by the action of mechanical friction during the application of the product [12].

Dental care in COVID-19 times requires the adoption of safe work practices involving strict protocols to control the spread of the new Coronavirus. It is necessary to implement and develop specific actions to review procedures and adapt the entire oral health team to this new reality.

As it is a new disease with a controversial and unpredictable evolution [1], studies are still divergent and inconclusive with regard to several aspects, from preventive to control measures, and the development of an effective vaccine against SARS-CoV-2.

For this reason, it is time to unite professional and scientific teams to reduce circulation and contact between people and adapt dental environments to the new biosafety protocols, through the establishment of flowcharts that cover the new routine of care in health services.

Finally, it is necessary to emphasize that only the time and the development of more scientific research on the new Coronavirus, will be able to add new techniques and actions to the protocols of the health services, as well as will bring more reliable conclusions about the several doubts that still exist about this pandemic that overtook the world.

CONCLUSION

The pandemic caused by the new Coronavirus has generated major changes and intensified biosafety practices. The risk of cross-infection should be a constant concern in dentistry, with careful patient screening, encouraging hand hygiene, strict use of PPE, mouthwashes with antiseptics before procedures, reduction of aerosol production and constant disinfection of all dental clinical environments. As it is a new disease, more scientific research is needed to establish the safest protocols for healthcare services.

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