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Review Article

COVID-19: Review of the Best Recommendation Guidelines for a Secure Dental Practice

Angélica Braga de Oliveira[1], Giovanna Lopes Lanza[2] & Jôice Dias Corrêa[3*]

[1]*DDS, Graduate Program in Dentistry, Department of Dentistry, Pontifícia Universidade Católica de Minas Gerais. Av. Dom José Gaspar, 500. Belo Horizonte, Minas Gerais, Brazil*

[2]*Grad Student, Graduate Program in Dentistry, Department of Dentistry, Pontifícia Universidade Católica de Minas Gerais. Av. Dom José Gaspar, 500. Belo Horizonte, Minas Gerais, Brazil*

[3]*PhD, Graduate Program in Dentistry, Department of Dentistry, Pontifícia Universidade Católica de Minas Gerais. Av. Dom José Gaspar, 500. Belo Horizonte, Minas Gerais, Brazil*

[*]**Correspondence to:** Dr. Jôice Dias Corrêa, PhD, Graduate Program in Dentistry, Department of Dentistry, Pontifícia Universidade Católica de Minas Gerais. Av. Dom José Gaspar, 500. Belo Horizonte, Minas Gerais, Brazil.

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Abstract

The COVID-19 pandemic turned into a big problem for public health. The dentistry activity represents a high potential source for virus transmissibility. Dental health care professionals should know the mechanisms of the disease, the infection control procedures and be able to minimize the risk of transmission of COVID-19.

In this risk situation, it is important to apply the most recent protocols that are evidence-based. Dentists must be aware that additional biosecurity measures are required for preventing COVID-19 infection. This work summarizes the most recent guidelines to help clinicians in their preparation for this new era in dentistry.

Background

The COVID-19 pandemic has been the greatest one in the last century [1]. The causative virus was identified as SARS-CoV-2. In most cases, the virus causes mild-to-severe respiratory complaints [2]. Since humanity has not had contact with this pathogen before, we did not have antibodies to fight the virus. Besides, the virus is highly transmissible, with a transmission ratio of 1 to 2 people [3].

The virus that causes COVID-19 is thought to be spread primarily between people who are in close contact or by contaminated surfaces.

Infection control in dentistry is complex as we do not know who is contaminated. The pandemic demands important changes in dental practice. Dentists must be aware that additional biosecurity measures are necessary to avoid COVID-19 infection [4].

Methodology

This is a integrative review of the literature about the protocols for dental care during COVID-19 pandemics, A search was carried out in the literature (dental care and pandemic COVID-19) and in dental representative entities on the protocols indicated for the return of dental care worldwide. The article gathers all the information found, removing duplicates, in order to bring the most complete information about the protocols adopted in the world. It is important to remember that these protocols are being updated according to the evolution of knowledge on the topic.

Risks for Dental Workers

COVID-19 was included in group B of infectious diseases. However, the best protocols suggested that protection measures should be for group A infections (highly infectious pathogens [5]). This is because the COVID-19 transmission occurs via three modes: direct contact, saliva droplets, and airborne particles [6].

The practice of dentistry usually creates an aerosol that includes saliva, water, and pathogens, however, until now, there has not been a case of SARS-CoV-2 transmission during dental treatments7. It is important to remember that after the patient leaves the dental chair, aerosols are suspended in the air with a viable virus. Literature shows that the virus could survive on surfaces up to 7 days [7].

Recently, a study has reported the association between periodontitis and severity of COVID-19 infection [8]. This data shows the importance of dental treatments to preserve oral health and avoid possible complications in COVID-19 patients in the future. Our work has the objective to resume the best available guidelines to provide safe dental care for patients and professionals.

Practice Preparation - Pre-Appointments and Reception Area

1. Contact All Patients Before the Dental Appointment

Pre-appointment contact with the patients is essential. A questionnaire for COVID-19 risk should be

applied to any person that will be in the clinic [4,9]. If the patient reports symptoms or contact with someone positive for COVID-19 the only treatment should be to prescribe medication and, if the cases are emergencies, the treatment must be given with the maximum of precaution [4].

An individual with an acute respiratory condition is considered a suspected case of the new Coronavirus 2019 (COVID-19) when it is characterized by at least two (2) or more of these signs and symptoms: fever (body temperature higher than 37.8ºC), chills, sore throat, headache, cough, runny nose, olfactory or taste disorders [10]. It is necessary to consider the fever reported by the patient, even if not measured [11].

There are health questions to ask people, listed below, before they arrive in the clinic [4,9,12]:

1. Did you have a fever in the last two weeks (14 days)?

2. Do you have a cough? Breathing difficulty? Sore throat? Runny nose? Headache? Diarrhea? Nauseous? Vomiting?

3. Have you felt loss or disturbance in smelling or tasting?

4. Have you been in contact with any confirmed COVID-19 positive people?

It is also important scheduling vulnerable patients as the first appointments of the day, to decrease the risk of COVID-19 transmission among these people and:

2. Limit the Number of People Accompanying the Patient.

3. Measure the Patient's Temperature.

4. Intervals between Appointments Should Be at Least 1 Hour. The patients should be taken directly into the dental chair as soon as they arrive at the facility [4,7,9,12].

5. Advise the Patients and Staff to wear a facemask and to perform hand hygiene with alcohol-based hand rub 70% alcohol [4].

6. Prepare the Clinic to Receive People: the chairs in the reception room should be placed 1 meter apart. Remove any objects that cannot be regularly cleaned or disinfected (magazines, toys, newspaper). Avoid the use of water fountains and provide disposable cups. Disinfect the room twice a day [4,7,13].

7. At the End of the Day: Cleaning floors with sodium hypochlorite 1%.

Use of the PPEs

1. Common Recommendations: Short nails without polish and no jewelry.

2. Working Uniform: Members of Dental Service should wear a surgical mask if the procedure does not generate aerosol and wear an N95 or PFF2 without valve if the procedure generates aerosol. It should be changed every 4 hours. It is possible to re-use the mask if not damaged. For eye protection, goggles,

protective eyewear with solid side shields, or a full-face shield should be used, also a gown or protective clothing and gloves during procedures. Use of the Surgical hat or equivalent changed at maximum half day if not soiled (Table 1) [4,7,14].

Table 1: *Individual Protection Equipment Protocol*

IPE	Protocol for exchange	Allows disinfection	Protocol for Storage
Disposable surgical mask	Change to each patient or in the presence of dirt or moisture. Recommended use only if the respirator cannot be used (N95, PFF2, or equivalent without valve)	No	No
Respirator N95, PFF2 or equivalent without valve	Extended use (exceptionally in case of scarcity), alternating the days of use according to availability. Masks with compromised integrity (wet, dirty, torn, dented, creased, or seal failure) should be discarded immediately.	No	Plastic packaging (which allows washing and disinfection) with perforated lid or paper
Goggles with side sealing	Cleaning (water and soap, if there is visible dirt) and subsequent disinfection with 70% liquid alcohol (when the material is compatible), sodium hypochlorite, or other disinfectants, in the concentration recommended by the manufacturer, for each patient.	Yes	Clean and dry place
Disposable beanie	Each patient	No	No
Cloak/ Waterproof disposable cover minimum weight 30g/m²	Each patient	No	No
Cloak/ Waterproof disposable cover minimum weight 50g/m²	Each patient according to ANVISA Norms	No	No

Full face shields	Cleaning (water and soap) and subsequent disinfection with 70% liquid alcohol (when the material is compatible), sodium hypochlorite, or other disinfectants, in the concentration recommended by the manufacturer, for each patient.	Yes	Clean and dry place
Non-surgical procedure gloves	To each patient or in case of puncture/tear of the gloves	No	No
Sterile gloves (for surgical procedures)	To each patient or in case of puncture/tear of the gloves	No	No

Management of the Clinical Room and Dental Procedures

All working surfaces susceptible to be soiled by projection (1.5m around source) should be empty or covered with plastic covers to ease cleaning and disinfection. Paper records should be kept in drawers or boxes. Only the instruments needed for the dental treatment should be in the surgery room [4,15].

To perform hand hygiene use soap and water for at least 30 seconds. Or, you can use 70% alcohol if the hands are not soiled [4].

Always prefer four-handed dentistry, high power suction, and dental dams to minimize aerosols and avoid the use of spittoon [6].

Avoid intraoral radiographies and use extraoral techniques, such as panoramic radiography [4,16]. Impressions should be rinsed with cold water and disinfected with sodium hypochlorite 1% [12,14].

After Procedures

1. Advertise Patients: The patient must inform the dental clinic if they develop symptoms or are diagnosed with COVID-19 in the next 2 days after the dental treatment [4,17].

2. Cleaning the Surgical Room (Table 2): Ventilate the clinical room for at least 15mins with the window wide opened and the door closed. To clean and disinfect the dental operatory, professionals should delay the entry into the operatory until a sufficient time has elapsed for enough air changes to remove potentially infectious particles. There is a lack of evidence to give an accurate time required for clearance of infectious aerosols after a procedure. We currently accept that 30 minutes should be the recommended fallow period. However, this time can be affected by many factors including the layout of the room, the presence of ventilation, the type of procedure performed, the use of rubber dam, and the duration of the aerosol procedure. Floor cleaning should be at the end of each appointment [14].

Table 2: *Supplies for cleaning and disinfecting surfaces and equipment*

ITEM TO BE PROCESSED	PRODUCT	USE
Air and water hoses, dental chair, suction unit tips, triple syringe, equipment, stool, reflector handle, control panels, X-ray machine, spitter (avoid its use). **Wrap with plastic bags or plastic film does not dispense cleaning and disinfection.** **The internal cleaning of the hoses that make up the suction and spitting system must be carried out at the end of each service, with a 2.5% sodium hypochlorite disinfectant. It is important to be extra careful as this suction and spitting system can present reflux.**	**Water and neutral detergent** for dental-medical-hospital use	when there is the presence of organic matter and/or visible dirt, the surface cleaning must precede disinfection.
	70% Ethyl Alcohol Contraindicated for acrylics, rubbers, and plastics and can damage equipment lens cement	It must be applied on surfaces that are already clean without the presence of organic matter; Applied to surfaces or articles (?) through friction; Must be repeated 3 times.
	1% Sodium Hypochlorite: Can be disabled by light. Highly unstable, so it must be used immediately after dilution and discarded within 24 hours after dilution.	It must be applied on surfaces that are already clean without the presence of organic matter; Indicated for surfaces and non-metallic articles and thermosensitive materials; Friction action.
	0.5% Peracetic Acid	It is unstable when diluted and corrosive to metals. The contact time will be that indicated on the label.
Multiple-use electronic equipment: tensiometers, sphygmomanometers, thermometers, cell phones, computers, etc.	70% isopropyl alcohol	Friction action
Auxiliary table and other surfaces that were touched during the service (door handles, waiting room furniture, light switches, handrails, etc.), countertops.	70% Ethyl Alcohol	Friction action
	1% Sodium Hypochlorite	Friction action

Full Face Shield, Protective Goggles	**Water and neutral detergent** for dental-medical-hospital use	In the presence of visible dirt, cleaning must precede disinfection
	70% Ethyl Alcohol, if allowed by the manufacturer	Friction action
	1% Sodium Hypochlorite, if allowed by the manufacturer	Friction action
	Ammonium Quaternary - 5th generation (various formulations ranging from 1000 to 5000ppm)	It is recommended to rinse with water for complete removal of the product
Handpieces - high and low rotation pens	Enzymatic or neutral detergent for dental-medical-hospital use	Activation for 30 seconds followed by cleaning before the autoclave sterilization process. If sterilization is impossible, perform careful disinfection (rubbing with 70% ethyl alcohol for 3 times).
Floors, walls, and partitions	**Water and neutral detergent** for dental-medical-hospital use	Cleaning before disinfection
	Sanitary water	Dilute 2 ½ tablespoons of bleach in 1L of water
Molds	Chlorhexidine 2 to 4%	After molding, before pouring the plaster
	0,5% Sodium Hypochlorite	

Disinfection of the clinical environment surfaces must be carried out in the sequence below:

- From the area less contaminated to the area with more contaminant risk.
- From up to down.
- From the inside out [16].

3. Removing the PPEs Table 3.

Table 3: *Use of PPE*

Sequence to each patient		
Step by step	**Sequence for the Vestment**	**Sequence for Remove**
1	Wash your hands with soap and water for 20 seconds	Gloves
2	Waterproof Lab coat	Wash your hands
3	Mask	Gown / Lab coat
4	Goggles	Full face shield
5	Beanie	Beanie
6	Full face shield	Hand wash or use 70% alcohol gel
7	Gloves	Goggles
8	x	Mask (removed outside the clinical environment)
9	x	Wash your hands.

4. Cleaning the Instruments: sterilization protocols do not change [18-21].

Conclusion

The COVID-19 pandemic has been present for more than one year now since the first case. What we know about the virus is that the transmission occurs after contact with body fluids, mainly saliva and respiratory droplets. The pandemic demands important changes in our daily lives and the dental practice as well. Dentists are among the professionals with a higher risk of contamination as the oral environment represents a great source of the virus and other respiratory pathogens. Dental workers should know and practice the best protocols to avoid COVID-19 transmission. This work brings the most recent guidelines to help clinicians in their preparation for this new era for dentistry (Supl 1).

Disclosure of Interest

The authors report no conflict of interest.

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