

# Innovation in the Protocol of Biosafety in Dentistry in Times of Sars- cov-2

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## Abstract

**Due to the innumerable clinical protocols developed during the current period, we aim to create an effective protocol to meet the needs of dental surgeons who work and or administer clinics. As a consequence of the advance of the pandemic, the global economic crisis caused the high demand for personal protective equipment and, consequently, high prices. The objective of this work is to present a service protocol for preventing the transmission route of the new COVID-19 in dentistry in order to protect the patient and the team that will provide the service, in addition to mitigating the impact on the budget of dentists who work and or administer a dental service.**

**Keywords:** Covid-19, Coronavirus and Biosafety.

## Introduction

The World Health Organization (WHO) declared in January 2020 a global pandemic caused by the disease COVID 19. Pandemics are defined as epidemics of infectious diseases that spread over large geographic regions, occurring around the world, at almost the same time. The pandemic caused by COVID 19 has stood out with a high impact on public health due to the high number of cases of people infected in a short period of time. In addition, health professionals, especially dental surgeons, face great difficulty in performing dental procedures, since the current scenario has interrupted all non-emergency dental procedures and due to the great risk of contamination via exposure frequent saliva, blood and fluids, production of aerosols and droplets through their equipment.

Coronavirus (Covid-19) is part of a large family of viruses, known since the mid-1960s, that received this name due to the spikes on its surface that resemble a crown (from the Latin corona). There are believed to be about thirty-eight species of Coronavirus. They were initially identified in 1962. They are large, spherical and encapsulated viruses. They have already caused other respiratory diseases such as SARS - severe acute respiratory syndrome and MERS - respiratory syndrome in the Middle East. Covid 19 infections can cause everything from a common cold to severe respiratory syndromes. Covid 19 is the new variant of the coronavirus and its first official case was registered in the city of Wuhan in China in December 2019.

The first available data on the Coronavirus report that they have a high capacity for infection, but relatively low lethality. Patients over 70 years of age and who have chronic diseases such as diabetes, cardiovascular, respiratory and autoimmune diseases are subject to increased lethality. The Covid-19 pandemic puts pressure on countries' health services in a way never seen in recent decades. Even wealthy nations with public universal access systems, such as the United Kingdom and Italy, have not met the demand for hospitalizations and respirators.

Simulations of how the Brazilian health system should behave with the increase in the number of infections by the Sars-CoV-2 virus and hospitalizations due to the Covid-19 disease indicate that only the best management of all existing resources, public and private, they will not be enough to cope with the explosion in demand for hospital beds, vacancies in intensive care units (ICUs) and mechanical ventilators. If there is no significant increase in service capacity, with the opening of new beds and ICUs and the installation of more respirators, the demand for these three types of medical services should exceed the system's operating limit in the country causing the system to collapse [1-12].

According to simulated scenarios show that, if no change in the contamination trajectory was observed, around the beginning of April Brazil would face shortages of hospital beds, ICU beds and ventilators, with ICU beds being the most immediate problem. The timing of scarcity across the country depends on the intensity of transmission. In addition, the population that depends exclusively on SUS (Unified Health System) can bear the greatest burden, further

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exacerbating existing inequalities, which requires reflection on equity and ethics in the allocation of services. Avoiding this scenario is a primary task.

As dental clinics were considered to have a high virus transmission zone, all of them stopped elective treatments, which led more than 50% of Dental Surgeons to live in a financial crisis. In addition, with the amount of PPE needed for individual and patient protection, the costs of dental treatments tend to skyrocket, and there may be a large loss of patients, which would force the closing of a large number of offices.

The objective of this work was to create a service protocol for the dental service at the time of the COVID 19 virus pandemic, using the national and international scientific papers available, in order to cause the least impact on the management of dental clinics and offices.

## Materials and Methods

Due to the urgency of developing a protocol to protect dental surgeons and patients, we carried out studies and research work in the medline database from March to June 2020. Articles with full versions and free, written in Portuguese and English, in addition to technical standards of the National Health Surveillance Agency, Health Surveillance Secretariat and World Health Organization.

### Types of transmission

The types of transmission can be directly, through sneezing, saliva droplets and other bodily secretions. By contact, with the nasal, oral and ocular mucous membranes, after touching contaminated surfaces with your hands and then scratching or touching eyes, nose and mouth. In dentistry, contamination occurs through aerosols, which may contain blood and saliva.

Therefore, the virus can be transmitted from person to person through direct or indirect contact with fluids and saliva. Due to the characteristics of dental care that include proximity face to face between patients and dental surgeons, frequent exposure to saliva, blood and fluids, production of aerosols and droplets through their equipment (high speed, triple syringe, ultrasound, among others), Biosafety measures are essential to prevent the transmission of the virus. In situations of outbreaks of certain diseases, care with the practice becomes even more necessary so that professionals and patients are protected.

It is recommended that during the coronavirus epidemic, children maintain adequate oral hygiene and a balanced diet in order to contribute to an improvement in health in general and increasing their immunity. Keeping the teeth and mouth clean, avoiding the accumulation of bacterial plaque on them, or preventing secretions in the oral cavity, using oral solution, toothbrush, or the combination of these can reduce the risk of pneumonia associated with mechanical ventilation

that can occur in critical patients who are in UTIS. We need to fully educate the general public about the seriousness of Covid 19 and the role of each in preventing and spreading this virus. In times of pandemics such as the one we are experiencing now, new challenges arise that professionals must respond with even greater care in biosafety, ethics, zeal, updated and periodic training.

### Personal protective equipment

PPE stands for Personal Protective Equipment. Any device or product for individual use used by the worker in order to protect him from risks that could threaten his safety and health. For the practice of dentistry, the use of PPE is essential both for the protection of the professionals involved and for the protection of patients. The PPE recommended for use during consultations are: surgical pajamas or disposable coveralls, disposable cap, goggles, PFF2 respirator or similar, face shield, disposable surgical coat, disposable procedure gloves and shoe covers.

As the epidemic accelerates in Brazil, access to personal protective equipment (PPE) for health professionals is a constant concern. The scarcity of PPE is being observed in several Brazilian institutions as in many countries. The maintenance of PPE in health institutions must be a policy of the State, governments must mobilize themselves so that the national industry responds to this challenge. Unfortunately, this is not what we are seeing, the prices of PPE, especially disposable masks and aprons, have increased significantly, associated with the shortage of the market. We have a huge dependence on the Chinese industry that produces a large part of the PPE used in Brazil. With the Coronavirus (COVID-19) there was a high demand for PPE, which consequently generated a drastic increase in values, the well-known general law of demand and supply, the basis for determining prices. This model argues that economic agents make decisions that vary the price until it is such that the quantity sought is equal to the quantity offered, resulting in an economic balance in which there are no incentives to change quantities or prices. In an environment of high potential for contamination, which is the dental office, due to aerosols and direct contact with components of the oral cavity, PPE has specific and complementary functions in protection.

### Recommendations for service

The knowledge of the symptoms of the disease guides the dental surgeon in screening for the scheduling and care of his patients. The most common symptoms of COVID 19 are; fever, fatigue, tremors and chills that do not go away, muscle pain, headache, coughing, sneezing, sore throat, loss of smell or taste and difficulty in breathing (in more severe cases). According to the Ministry of Health of 2020, in order for the patient to be scheduled, it is necessary for him to answer the following questions:

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- "Have you been in contact with people an positive diagnosis or with suspected symptoms of COVID19?",
- "Do you have cold or flu symptoms, fever, dry cough, sore throat, runny nose, joint pain or breathing difficulties in the last 14 days?"
- "Did you notice changes in taste or smell in the last 14 days?"

**If the patient answers positively to some of the questions, the appointment is postponed.**

When the patient arrives at the dental's office or clinic, his temperature must be measured and it must be below 37.8°C, so that he can carry out his consultation. This also receives a disposable apron and shoe covers. To start the service, the patient receives a cap and goggles and performs a mouthwash with Hydrogen Peroxide 1.5% and another with 0.12% chlorhexidine solution, both 20 ml for 1 minute.

**Some recommendations for during the service are:**

- Avoid using a triple syringe for the spray function.
- All visits with the use of high rotation and ultrasound must be performed with a physical barrier (SprayBlock® - attachment 01), which minimizes the spread of droplets and aerosols (water, saliva and blood) during the procedure.
- Working with four hands, where the dentist can only touch the patient's mouth and critical materials. The assistant must take all the necessary material. In case the dentist needs to handle in addition to the critical materials (when requested), use a glove, the assistant must pick up and deliver in position for placement. After use the dentist removes and discards.
- Use cotton or gauze to dry, if possible.

## Conclusion

Dentistry is an occupation with a high risk of contagion of the disease caused by the coronavirus. The care protocol created contains preventive measures to control and minimize the infection that can occur in dental services. The correct use of PPE, hand washing, the use of the physical barrier (SprayBlock® attachment-01) and the biosafety standards, make up a material for the efficient practice of our activity. In this moment of crisis where there is a high cost of PPE's and a high demand for them, dentists are looking for a safe, efficient protocol that has a low impact on the cost of their office, always aiming to protect professionals and patients.

We are living intensely a period of new challenges, in which professionals must respond with care, ethics, zeal and constant training. The involvement of the whole society in the conscious adoption of protective measures against Covid-19 requires a change in individual and collective behavior. In this scenario, we need everyone's collaborative

effort: government, families and citizens. The protocol was developed with the most recent studies up to the moment of its creation.

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