COVID-19 Management in Clinical Dental Care Part III: Patients and the Dental Office

Paulo Melo*, Patricia Manarte-Monteirob, Nélvio Veigac, André Brandão de Almeidad, Pedro Mesquitee

a EpiUnit, Faculty of Dental Medicine, Institute of Public Health, University of Porto, Portugal
b Department of Medical Sciences, Faculty of Health Sciences, University Fernando Pessoa, Porto, Portugal
c Faculty Dental Medicine - Universidade Católica Portuguesa; Center for Interdisciplinary Research in Health (CIIS) - Universidade Católica Portuguesa, Viseu, Portugal
d Lisbon Paediatric Dentistry Service (SOL) − Santa Casa da Misericórdia de Lisboa (SCML), Lisboa, Portugal
e Faculty of Dental Medicine, University of Porto, Portugal

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ABSTRACT

The coronavirus 2019 (COVID-19) pandemic dramatically changed all aspects of life. In the context of clinical dental care, a significant number of new recommendations have been implemented to comply with public health policies, ensuring the safety of dental care professionals, staff, and patients and, thus, preventing further spread of the virus. This article is the third in a series of three on the management of COVID-19 in clinical dental care and presents a set of recommendations and standards to be implemented in the context of the COVID-19 pandemic. These include remote contact with all patients for triage and guidance before scheduling a clinical visit to know if they have COVID symptoms or are positive for COVID, if they belong to a risk group, and if there is a suggestion that aerosol-generating procedures (AGPs) will be required during their visit. It also reviews additional precautionary measures in the waiting room and reception area, where the environment is reorganised to protect patients and clinical staff, avoiding situations that could result in cross contamination. The dental office operates under a strict set of guidelines, namely, use of personal protective equipment by professionals, contact with patients, a strategy to avoid aerosol-generating procedures, as well as disinfection procedures for the dental office before, during, and after each patient visit. The implementation of these protocols to mitigate cross infection and spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the dental office will help improve safety and restore the confidence required to provide dental care to patients during the COVID-19 pandemic.

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Introduction

The coronavirus 2019 (COVID-19) pandemic has dramatically changed the routines in all aspects of life. In the context of clinical dental care, where preventive measures to avoid cross contamination were already in place, a significant number of new recommendations have been implemented to comply with public health policies, ensuring the safety of dental care professionals, staff, and patients and, thus, preventing further spread of the virus.¹

This article is the third in a series of three on the management of COVID-19 in clinical dental care. As previously stated, although it might occur in some medical procedures, there is no evidence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission through aerosol-generating procedures (AGPs) in a dental care setting.² Considering the possibility of interactions of people in the dental office with others in the environment, collective diligence is essential (see COVID- Management in Clinical Dental Care. Part I).² The recommendations regarding clinical dental care in the era of COVID-19 focus on prevention and safety.³
Such recommendations should be adjusted to the epidemiological setting (prevalence of infection in the area at the time when care is delivered), the patient’s individual characteristics, and the type of procedures to be performed, together with access to personal protective equipment (PPE) (see COVID-19 Management in Clinical Dental Care. Part II). Protocols for cleaning, disinfection, and sterilisation of the dental care environment, as well as equipment, to mitigate cross infection also need to be adjusted.

Every dental office should implement a set of basic standards, preferably in writing, for patients, dental care professionals, and staff to follow, with consideration of the level of risk. The entire team (both clinical and administrative personnel) should be well-educated about the disease and the modes of transmission to identify high-risk individuals and adopt appropriate preventive measures.

Dental care professionals should continuously evaluate the rationale for the adopted measures, including the cost-to-benefit ratio, without ever placing any of the involved individuals, or the public, at risk.

This article aims to present a set of recommendations that includes triage and guidance to all patients before scheduling a dental appointment; guidance on personnel preventive measures and health literacy; additional precautionary measures for the waiting room, reception area, and dental operatory; and disinfection procedures before, during, and after each patient visit.

General recommendations for COVID-19 in clinical dental care

Patient management before a dental visit

The COVID-19 pandemic requires several changes to dental practice that should be considered, namely, how the dentist and staff deal with the patient before, during, and after a dental visit so as to ensure the safety of all participants and minimise the risk of transmission.

It is recognised that many patients who are COVID-positive are asymptomatic, and therefore, all patients seen in the dental office should ideally be evaluated (by a diagnostic test) to verify that they are not infected with SARS-CoV-2. However, the use and sensitivity of diagnostic tests are still unclear, even though nasal swab tests have offered high reliability (see COVID-19 Management in Clinical Dental Care. Part I). On the other hand, neither the antigen (virus) nor the immunological (antibody) tests can at present accurately define current or previous infection with SARS-CoV-2.

As stated previously, it is not now possible to accurately determine who is infected with SARS-CoV-2, and thus, every patient should be considered as potentially infected at all times while in the dental office. Of course, the epidemiologic setting should also be taken into account because the risk of actually being infected depends largely on the prevalence of the disease in that location.

Therefore, the first step to prepare for a dental visit is to remotely contact (by phone or electronically) all patients scheduled to visit the dental office for an appointment to obtain current information about the patient’s status and allow an accurate assessment at the time of the visit. The scheduling of visits, specifically their duration and the intervals between appointments, should be adjusted during the COVID-19 pandemic.

Remote triage should help determine if the patient has been, is, or is at risk of being positive for COVID-19. It is also important to know if the patient belongs to any of the high-risk groups and if an AGP is expected during their visit. This information will allow identifying patients positive for COVID-19 or those at high risk as well as the need for procedures that require additional precautions. Patients should be asked specifically whether they have acute respiratory signs or symptoms compatible with COVID-19 (Table 1), a positive diagnosis for COVID-19, or have had unprotected contact with a confirmed or suspected COVID-19 case. If a positive response is elicited, ask if the patient is still in isolation or the quarantine period. If symptoms suggestive of COVID-19 are present, the patient should be instructed to contact the local or national health public authorities and follow the appropriate guidelines.

For patients identified as cases or potential cases of COVID-19, the first option should be to try to resolve or mitigate the patient’s problem remotely and postpone or reschedule the

| Table 1 – Patients’ triage and guidance. |
|-----------------------------------------|
| Contact by phone before the visit         | If a visit is scheduled, instruct the patient |
| 1. Have you been diagnosed with COVID-19? If so, are you still within the isolation period? | 1. Bring a community mask. |
| 2. Have you had contact with someone diagnosed with or suspected of having COVID-19? If so, are you within the isolation period? | 2. Come alone to the visit (except in justified situations, where the patient can be accompanied by no more than 1 person). |
| 3. Have you had cough, a fever (>38°C) or respiratory difficulty in the past 14 days? | 3. Disinfect hands with an alcohol-based antiseptic solution upon arrival. |
| 4. Have you had any gastrointestinal disorder (diarrhoea) in the past 14 days? | 4. Arrive on time for the visit (not too early and not late). |
| 5. Have you experienced any loss of smell or taste in the past 14 days? | 5. Avoid wearing unnecessary clothing and accessories. |
| 6. Do you have any characteristics that put you in a risk group for COVID-19? (>65 years old, cardiovascular disease, diabetes, asthma or respiratory disorder, cancer, autoimmune disorder, immunosuppression, organ transplant, pregnancy) | 6. Pay the bill by credit or debit card, preferably using the contactless option. |
| 7. Respect a 2-metre distance from other patients in the waiting room. |

COVID-19 = coronavirus 2019.
visit so that the patients can comply with the mandatory quarantine or isolation period. When the situation is urgent or cannot be postponed, and rescheduling is not an option, the patient should be considered at high risk, and the visit scheduled. Urgent situations include severe pain (not manageable with analgesic therapy), severe infection (affecting the fasciae and deep tissues of the head and neck, fever, trismus, general malaise), dental or orofacial trauma, and uncontrolled hemorrhage.4

According to the region or country, the treatment of patients identified as cases or potential cases of COVID-19 can have at least 3 different paths. The first consists of scheduling the appointment at the dental office at a specific time, which should preferably be the last appointment in the morning or the afternoon. This will prevent the patient from having contact with other patients in the waiting room and will allow time for air recirculation after the visit.4,6 The second path is referring the patient to a dental office dedicated to COVID cases where the patient will schedule the appointment. The third path is referring the patient to a government dental clinic or hospital dedicated to COVID cases, which may be a local emergency department, a public health clinic, or a dental school, where the patient will schedule a visit.

In cases where low risk is identified by remote triage, the test for infection is negative, or the patient has already recovered from COVID-19 (presumably now immune), the patient can be scheduled for a regular dental visit.4

Information regarding the patients’ age and health status should also be obtained to understand the patient’s health risk. Patients older than 65 years of age, pregnant, or with comorbidities must be considered as high risk, as described previously (see COVID - Management in Clinical Dental Care. Part I). These patients should have visits scheduled for the first time slot in the morning or afternoon.

Visits where AGPs are required should also be considered high risk. Visits without AGPs should be scheduled for the first time slots in the morning or the afternoon, while visits with AGPs should be scheduled for the last slot of the morning or afternoon. However, it is not always possible to foresee whether the dental treatment will include AGPs, and therefore, some flexibility must be built into the schedule.

After the remote triage, patients with scheduled visits should be informed of the infection control procedures (Table 1). This information should include all procedures from when the patient enters the dental office until they leave. Beforehand, patients should also be informed that they are required to wear a face mask during the entire time they are in the dental office, except when care is delivered, and to avoid bringing unnecessary clothing or accessories.5 They must be asked to arrive alone and on time to minimise the time spent in the waiting room. Additional precautions could be taken, advising patients to wait outside the office, in the car or elsewhere, and call them when it is time to enter. In justified situations – if the patient is a minor or has a motor or cognitive disability, they may be accompanied by no more than 1 person, who should also follow the infection control measures described for patients (Table 1). Patients should preferably pay the bill by credit or debit card using the contactless option or another method that avoids the exchange of cash.

Dental office, environment management, and patient visit

To guarantee the safety of all participants and minimise the risk of transmission, a set of basic standards should be implemented in all dental offices, covering all aspects of contact with patients (Table 2).

Reception and waiting room

For safety procedures to be properly implemented, information should be provided before the visit. This begins with entry of the patient into the office. There should be a dispenser with an alcohol-based antiseptic solution (ABAS) for patients to disinfect their hands upon arrival, body temperature should be measured via pyrometry, and patients must return home and stay under observation if the temperature is ≥38.0 °C. A surgical mask should be provided if the patient is not wearing one, social distancing should be

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Table 2 – Precautionary measures and cleaning and disinfection procedures for common areas of the dental clinic (reception, waiting room, and bathroom).

| Precautionary measures                                                                 |  |
|---------------------------------------------------------------------------------------|---|
| 1. Install an acrylic barrier at the reception desk or a sign advising a distance of at least 1.5 metres. |  |
| 2. Keep the reception area clean, with the minimum necessary office material on the reception desk. |  |
| 3. Keep a dispenser with an alcohol-based antiseptic solution in the reception area. |  |
| 4. Remove from the waiting room all decorative objects, magazines, water dispensers, and any other nonessential items that could be handled by multiple persons. |  |
| 5. Store TV and air-conditioner remote controls away from patients. |  |
| 6. Chairs in the waiting room should be separated by at least 2 metres. |  |
| 7. Remove from the waiting room all furniture and other items with upholstery that may be difficult to clean and disinfect. |  |
| 8. Leave liquid soap and towels or paper rolls in the dispensers in bathrooms. |  |
| 9. Disconnect any hand dryers in bathrooms. |  |
| 10. Post a pictogram in all bathrooms with instructions about how to wash hands. Do not brush teeth in the bathroom. |  |
| 11. Ventilate, preferably naturally, common areas. |  |
| 12. Check if the air conditioner is turned off. |  |

Cleaning and disinfection procedures

1. Clean and disinfect floors of all common areas of the clinic.
2. Use a mop (with water and a disinfectant solution) instead of a vacuum cleaner or a broom.
3. Clean and disinfect door and window knobs, banisters, handrails, blinds, light switches, tables, chairs, and desks.
4. Clean and disinfect the reception area and reception desk.
5. Clean and disinfect the working table.
6. Clean and disinfect the telephone, cell phone, computer keyboard and monitor, and printer.
7. Clean and disinfect bathrooms, including their floor.
respected, and the patient should be reminded of the protection and safety measures currently in force in the dental office (Table 1). Furthermore, there may be a mat soaked in a disinfectant solution at the entrance to the dental office for the patient to disinfect their shoes or shoe covers may be provided.

On arrival at the dental office, it is important to again ask if the patient has developed any signs and symptoms compatible with COVID-19 since the last contact (Table 1). If patients deny having these symptoms but demonstrates them while in the waiting room or before the visit begins, they should be informed that they are considered a potential COVID-19 case and will have to reschedule the visit. If in the presence of an urgent situation, 1 of the paths described for urgent situations, with patients identified as cases or potential cases of COVID-19, must be taken.

Changes should be implemented in the reception area, waiting room, and common areas of the dental office, as described in Table 2. It is important to clearly post pictograms developed by local or national health entities regarding handwashing and hand hygiene. The number of patients in the waiting room must be limited, and long periods in the waiting room should be avoided. Moreover, common areas should be cleaned and disinfected (Table 2) every 1 to 2 hours, including floors, light switches, door handles and knobs, reception desks, acrylic barriers, and support tables. All newspapers, magazines, and other unnecessary items must be removed from the waiting room. Frequent air renewal in the waiting room, preferably by opening the windows, is advised.

In the dental operatory

The dental procedures in the dental operatory should also be adjusted during the COVID-19 pandemic (Table 3).

The number of professionals inside the dental operatory should be limited to the minimum required, and unnecessary movement in and out of the office should be avoided. During treatment, the office door should stay closed for the duration of the appointment (Table 3). Phones and cell phones should not be used inside the operatory.

Professionals should carefully wash their hands before and after treatment and after every contact with potentially contaminated surfaces or equipment. The guidelines for donning and doffing the recommended PPE should be carefully followed, as previously described (see COVID - Management in Clinical Dental Care. Part II), and PPE should be worn when the patient enters the operatory.

Patients should disinfect their hands before entering the dental operatory. After seating and before dental treatment begins, patients should remove their mask and rinse with a 1% hydrogen peroxide solution for 30 seconds because SARS-CoV-2 is sensitive to oxidation, or with 0.2% iodopovidone, except if the patient is allergic to iodine. Once dental treatment is completed, the patient should put the mask on again and leave the dental office directly to go to the reception, where they should schedule their next appointment, if required.

Some procedures during dental treatment might mitigate AGPs. Dental treatment should be performed together with a chairside assistant (4-handed dentistry), and high-

Table 3 – Measures for the dental office before, during, and after patient clinical dental care.

| Dental Office Before dental care | During dental care | After dental care |
|---------------------------------|-------------------|------------------|
| 1. Plan an effective and pragmatic approach for the treatment to be provided. | 1. Prefer extraoral radiologic techniques. | 1. Keep the surgical mask or respirator on. |
| 2. Whenever possible, provide multiple services at each visit, to avoid additional visits by the patient to the dental office. | 2. Avoid aerosol-generating procedures whenever possible (ultrasonic scaler, high- or low-speed handpieces, 3-way air or water spray). | 2. Replace gloves, discarding the ones used during the visit in a container for contaminated waste. |
| 3. Check that blinds and curtains are open. | 3. Avoid unnecessary circulation in and out of the dental office. | 3. Disinfect reusable PPE (goggles, face shield, etc.). |
| 4. Check that the PPE level is compatible with the procedures to be conducted. | 4. Use a rubber dam for isolation whenever possible. | 4. Promote air renewal inside the office. |
| 5. Check that commonly touched surfaces are protected with a disposable barrier. | 5. Use high-speed suction. | 5. Disinfect the package of all materials that are not used during the visit. |
| 6. Store all objects that are not required for care. | 6. Prefer manual instrumentation. | 6. Remove protective disposable barriers, discarding them in a container for contaminated waste. |
| 7. Prepare all materials that might be required for the visit for easy access. | 7. Prefer low-speed handpiece. | 7. Test the availability of handpiece coolants towards the spittoon. |
| 8. Avoid greetings that involve close interpersonal contact. | 8. Minimise the amount of coolant used for ultrasonic instruments and handpieces. | 8. Thoroughly clean and disinfect all surfaces and equipment. |
| 9. Keep the dental office door closed. | 9. Direct ultrasonic or rotation instruments intraorally when in use. | 9. Clean the floor with detergent or a disinfectant solution, avoiding brooms and vacuum cleaners. |
| 10. Instruct the patient to rinse with a 1% hydrogen peroxide solution or 0.2% iodopovidone (be aware of allergies to iodine). | 10. Consider judicious use of audiovisual means for clinical recording. | 10. Disinfect the doorknob of the dental office. |

PPE = personal protective equipment.
speed suction should be used. The use of spray-generating equipment, such as 3-way air or water spray, ultrasonic scaler, and high- or low-speed handpieces, should be avoided if possible. In some procedures, the water stream from those instruments may be reduced, and they should be positioned in a way that the generated spray stays mainly within the patient’s oral cavity. Whenever possible, the 3-way air or water spray can be used for irrigation, followed by drying without spray, and low-speed handpieces should replace high-speed handpieces. Different AGPs may generate different amounts of aerosol and proper evacuation is needed.

During removal of caries or restorative procedures, manual instrumentation or chemomechanical approaches such as Carisolv should be used when possible to minimise AGPs.16-18 Preventive interventions or minimally invasive treatments are preferred. The treatment approach should be effective and pragmatic. The duration of each visit should be adjusted to the specific needs of each patient and treatment complexity. Whenever possible, multiple procedures should be performed at the same visit to reduce the number of patient visits.6 For surgical procedures, resorbable sutures should be used to avoid a visit for suture removal.8,15

Air management

After each dental visit (Table 3), air should be renewed for at least 10-15 minutes with air from outside the building, whenever possible, and the dental office should ideally be naturally ventilated by regularly opening windows. However, natural ventilation varies in different locations; it may be limited by natural climate conditions, such as the wind flow or differences in temperature and humidity between the outside and inside air, particularly when high airflow is required. Moreover, natural ventilation can be limited when outside temperatures are extreme.19 Alternatively, mechanical ventilation systems that allow air renewal without air recirculation may be used.6,12,20 Nevertheless, airflow in the wrong direction may help disseminate an infection, and therefore, outflow must always be directed to areas where there are no people or directly to the outside.6,12,13,16 The maximum ventilation rate (above which the risk of infection does not decrease) is unknown.10,16,17 If an air-conditioning system is used, it should be in the air-extraction mode and never in the air-recirculation mode. The system must be properly maintained, including disinfection by an approved method.16

The use of portable air filtration devices with high-efficiency particulate air (HEPA) filters, although apparently advantageous, may have some disadvantages because it is difficult to effectively control the flow of droplets in the direction of the filter, the filtering capacity is limited, the filter must be leakproof to be efficient, and the in-flow and out-flow of air are generally close to each other on these units, thus reducing filter effectiveness.10,16,21 The use of other systems, such as ultraviolet or other wavelengths with germicidal irradiation, photocatalytic oxidation, (eg, photohydroionisation), or ozone-generating air purifiers, is controversial because their effectiveness against SARS-CoV-2 and other coronaviruses has not been evaluated in the dental environment. Further, they may pose risks of occupational exposure when improperly calibrated. Consequently, there are no definitive recommendations regarding the use of these systems.16,22

Cleaning and disinfection procedures

The dental operatory should be cleaned and disinfected by individuals wearing PPE. The interval between visits must allow time for cleaning and disinfection, organisation of the operatory room, and change of PPE. The cleaning, disinfection, and protection of surfaces and the cleaning and disinfection of floors between appointments (Table 4) should never be conducted before air renewal. Vacuum cleaners or brooms should not be used.19,23

Disposable barriers made of plastic, cellophane, or aluminium protecting the hoses of the equipment and the surfaces that are most exposed to hand contact (eg, light and tray handles, rotary instruments, curing light)15 (Table 3) should be replaced after each visit (Table 4). Thorough cleaning and disinfection of every surface and area of contact with the patient (eg, armrests and headrest, spittoon, suction instrument, tray, lights, switches/buttons, surfaces, and chair),8,24 including door handles and knobs, should be performed between dental visits.

Cleaning and disinfection (Tables 2, 3, and 4) should be conducted using ordinary domestic detergents and disinfectants (eg, 0.1%-0.5% sodium hypochlorite for 1 minute for nonmetallic surfaces; 70% alcohol for at least 1 minute; or 0.5%-1% hydrogen peroxide for at least 10 minutes).2 Small surfaces may be washed and disinfected with alcohol-based or bleach-based disinfectant wipes or other disinfectant products. A fog disinfection system might be used.

The floor should be disinfected between visits with a ready-to-use solution containing sodium hypochlorite at a 0.5% concentration or 70% alcohol for metal or other surfaces that are not compatible with sodium hypochlorite. Other virucidal cleaning and disinfectant products may be used for the floor and surfaces, including chloride tablets to dilute in water at the time of use and detergent solutions containing a disinfectant in spray, liquid, or other forms.23

Regarding the collection, separation, handling, and decontamination of products and medical devices removed from their package but not used, the protocols currently in force for the disinfection and sterilisation procedures remain valid in the context of COVID-19.25 All packaged products and materials exposed during the clinical procedures and not used should be thoroughly cleaned and disinfected before being stored again in drawers or closets.

Management of residues and contaminated material should preferably be accomplished wearing thick rubber gloves and a waterproof apron or gown (see COVID-Management in Clinical Dental Care. Part II). Waste, including PPE, should be handled in accordance with health care facility policies and local regulations.

Dental care professionals and staff management

Dental care providers have a civic and professional responsibility to ensure the safety of their staff, patients, the public, and
Table 4 – Procedures for the dental office between clinical appointments and at the end of the working morning, afternoon, and day.

| Dental Office Between clinical appointments                                                                 | At the end of the morning, afternoon, and session                                                                 |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1. Remove and store all contaminated material (protective bibs, cups, drinking glasses, suction tips, protective plastic barriers). | 1. Promote air renewal for at least 15 minutes in the dental office and remaining areas of the clinic.             |
| 2. All cutting and perforating instruments should be handled in accordance with health care facility policies and local regulations. | 2. Prepare products that will be used for surface and floor disinfection.                                       |
| 3. Store all contaminated instruments and waste to be transferred to the disinfection or sterilisation room. | 3. Thoroughly clean and carefully disinfect all work surfaces (desks, curing lights, and other equipment in the dental office and disinfection or sterilisation room). |
| 4. Thoroughly clean and disinfect equipment surfaces (eg, lamp, chair arms, hoses, chair, armrests and headrests, suction tube, spittoon, curing light, intraoral radiology device). | 4. Clean and disinfect all equipment, the dental chair, and the intraoral radiology device.                       |
| 5. Clean and disinfect all exposed surfaces (eg, desks and other furniture in the dental office and knobs). | 5. Clean and disinfect the suction equipment and the spittoon.                                                   |
| 6. Clean and disinfect materials and products before storing them in drawers or cabinets.                     | 6. Clean and disinfect the suction and spittoon filters.                                                          |
| 7. Any impressions or models for custom-made dental devices should be cleaned, disinfected, and stored before being sent to the laboratory. | 7. Clean and disinfect light switches, doorknobs and computer keyboards and monitors in the dental operatory.     |
| 8. Promote air renewal depending on the procedure, available anti-aerosol devices, the room size, and the presence of windows. | 8. Remove PPE and place it in a container for waste that should be handled in accordance with health care facility policies and local regulations. |
| 9. Clean and disinfect floors.                                                                                | 9. Wash and disinfect hands for at least 20 seconds.                                                              |
| 10. Organise and prepare material, products, and instruments beforehand for the next visit (disposable barriers placed on equipment or dental chair, intraoral radiology device, curing light, etc.). | 10. Remove the clinical apparel and store it in a closed bag to place it directly in the washing machine.        |
| 11. Check that PPE is properly donned for the next visit.                                                     | 11. Wash and disinfect hands for at least 20 seconds before leaving the workplace.                                |

PPE = personal protective equipment.

As the population acquires immunity (group or herd immunity) or an effective treatment or vaccine for SARS-CoV-2 becomes widely available, the threat level is expected to be reduced. Until then, dental care professionals have the duty to help limit the spread of this disease which includes educating and informing patients and the public of prevention and safety procedures. The best way to prevent COVID-19 is to avoid being exposed to SARS-CoV-2, by maintaining social distancing, washing hands, routinely cleaning and disinfecting touched surfaces, and wearing a face mask.26 All staff working in dental offices should be informed and have regular refresher training on prevention, safety, and spread of SARS-CoV-2 infection.27 The experience acquired during this pandemic will reinforce and strengthen dental office infection prevention.

Conclusion

The implementation of these recommendations to mitigate cross infection and the spread of SARS-CoV-2 in the dental office will improve the safety and restore the confidence required to provide dental care to the population during the COVID-19 pandemic. Dental care professionals should regularly evaluate the rationale for the indicated recommendations, including the cost-to-benefit ratio, without ever placing any of the involved individuals, or the public, at risk. These recommendations are not meant to supersede but, rather, to complement the information issued by national and international health authorities, including the World Health Organization.1
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