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Recommendations for Managing Endodontic Emergencies during Coronavirus Disease 2019 Outbreak



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ABSTRACT

Introduction: The management of endodontic emergencies has been particularly challenging during the coronavirus disease 2019 (COVID-19) outbreak because of the possible generation of airborne particles and aerosols. The aim of this report was to contribute to the practice of endodontics by proposing a general protocol for the management of emergencies showing the rationale for remote diagnosis, clinical procedures, and the use of personal protective equipment and barriers at the dental office during the COVID-19 outbreak.

Methods: A review of the literature was conducted up to May 2020 on relevant institutional sites, aiming to retrieve the best updated evidence. The reporting considered the Reporting Tool for Practice Guidelines in Health Care statement. **Results:** Recommendations from Cochrane Oral Health, the American Dental Association, and the Centers for Disease Control and Prevention were included along with the American Association of Endodontists resources and scientific articles that addressed the issue. **Conclusions:** The proposed protocol could contribute to the management of endodontic emergencies at the dental office during the COVID-19 outbreak. (*J Endod* 2021;47:3–10.)

KEY WORDS

Coronavirus disease 2019; dental care; emergency; endodontics; personal protective equipment

Coronavirus disease 2019 (COVID-19) was declared a pandemic by the World Health Organization in March 2020¹. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a highly contagious zoonotic virus, continues to escalate globally, and has an incubation period of 1–14 days^{2–4}. Although the latest findings indicate that asymptomatic infected patients are also carriers, symptomatic COVID-19 patients are the primary transmission source. Besides that, it remains to be established how long patients could be considered a possible source of transmission during the recovery process^{3,5–7}. To limit the community spread, strategies include avoiding human-to-human transmission and identifying, isolating, and prompt treatment for COVID-19 patients⁴.

The live virus was detected in the saliva of 91.7% of asymptomatic infected patients⁸. Thus, direct contact with the mucosa during both diagnostic and therapeutic procedures requires special care⁹. The virus can enter the saliva from the upper and lower respiratory tracts as well as from the gingival crevicular fluid and major and minor salivary glands¹⁰. Once the oral cavity is manipulated, viral particles have the ability to become aerosolized, can become airborne for 3 or more hours, and may spread to contaminate multiple surfaces in the surrounding area^{11–13}. In this sense, currently, endodontists in private practice should accept only nondeferrable emergencies¹⁴.

Aiming to address endodontic emergencies, a questionnaire should be used to screen the oral complaints and health conditions of patients, also considering special needs and the potential COVID-19

SIGNIFICANCE

Considering that endodontists should accept only nondeferrable emergencies during the COVID-19 outbreak, a general protocol for the emergencies is required showing the rationale for remote diagnosis, clinical procedures, and the use of personal protective equipment and barriers at the dental office.

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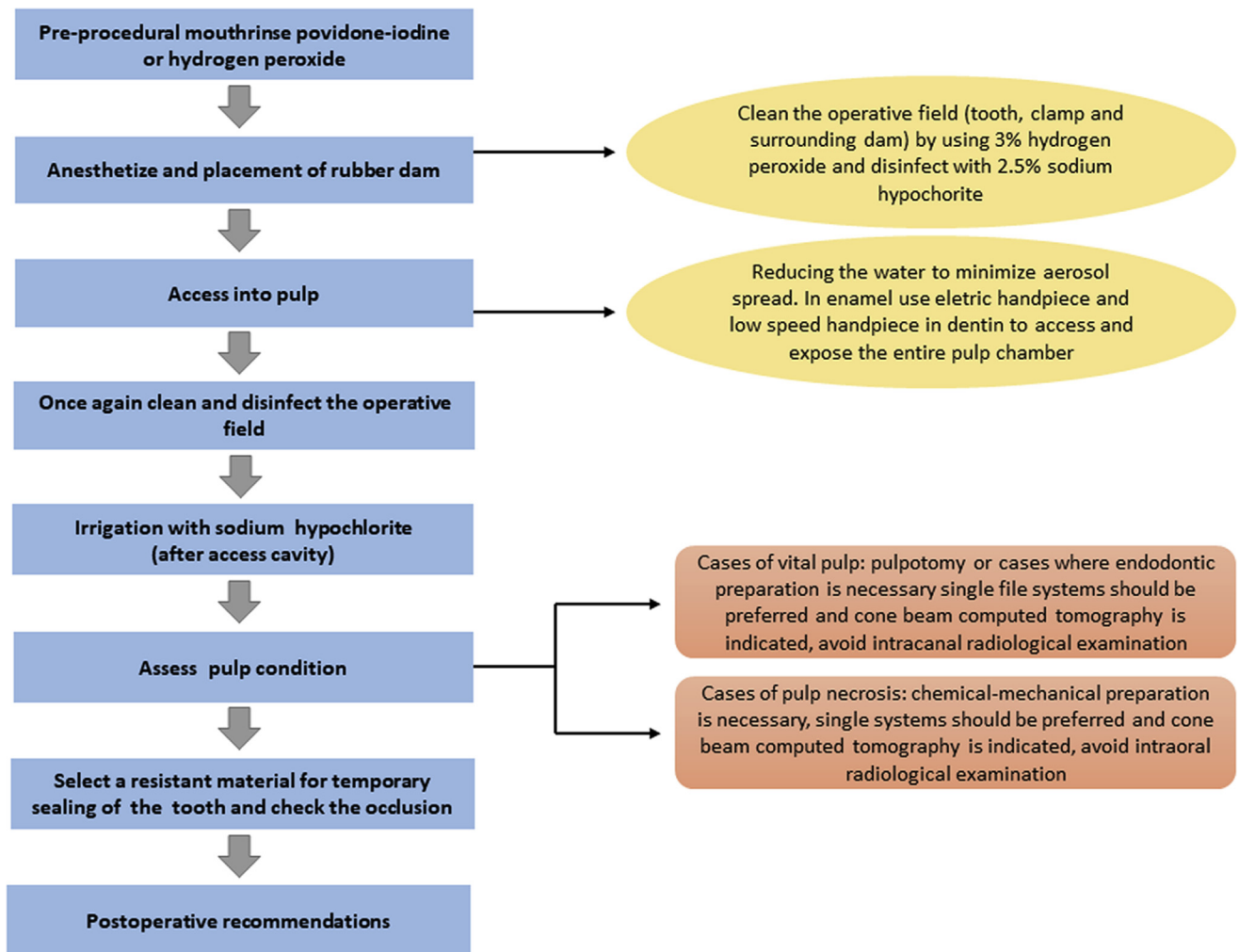


FIGURE 1 – A flowchart of the clinical protocol during endodontic treatment

status^{15,16}. Interestingly, during the COVID-19 epidemic in Wuhan, China, the majority (50.6%) of dental emergencies were of endodontic origin¹⁷. These endodontic emergencies included symptomatic irreversible pulpitis, symptomatic apical periodontitis, acute apical abscess, and traumatic dental injuries. Therefore, it can be assumed that endodontists are on the front lines of this disease outbreak.

Considering the pandemic, providing efficient emergency dental care and keeping the dental team and patients safe are primary concerns⁹. Along with reinforced safety measures, minimally invasive treatment is recommended¹⁸. In this sense, protocols in endodontic practice would be relevant to endodontists and patients. Because there has been truly little published in the endodontic field regarding the management of endodontic emergencies during the COVID-19 outbreak, this study aimed to review the literature to compose a clinical protocol or recommendations about this theme.

MATERIALS AND METHODS

A review of the literature was conducted up to May 2020 on relevant institutional sites, aiming to retrieve the best updated evidence. Sites for Cochrane Oral Health, the American Dental Association, the Centers for Disease Control and Prevention, and the American Association of Endodontists were searched, aiming to retrieve the best updated evidence. This protocol was reported in the context of the Reporting Tool for Practice Guidelines in Health Care statement in May 2020¹⁹.

The current protocol followed the recommendations of a rapid review of international sources of guidance documents for reopening dental services published on May 6, 2020¹⁶, including the American Dental Association and Centers for Disease Control and Prevention recommendations and scientific articles that considered the management of dental emergency care during the pandemic^{2,20}.

Endodontic treatment in the COVID-19 context should be focused only on emergency therapies²⁰. Contact between the patients and the dentist during endodontic therapy can create a substantial risk of contamination and cross infection and spread the virus in dental practice²¹.

A triage questionnaire should be performed to understand the chief complaint of the patient, distinguishing between emergency and urgency, including the general health status. This first contact aims to offer the best approach to the patient's problem, not exposing both parts without necessity^{21,22}. The following questions were proposed by Walton and Keiser in 2010²³ to detect a true emergency:

1. Does your pain interfere with your sleep, food, work, concentration, or other daily activities?
 - A true emergency leaves the patient unbalanced, preventing them from performing routine activities.

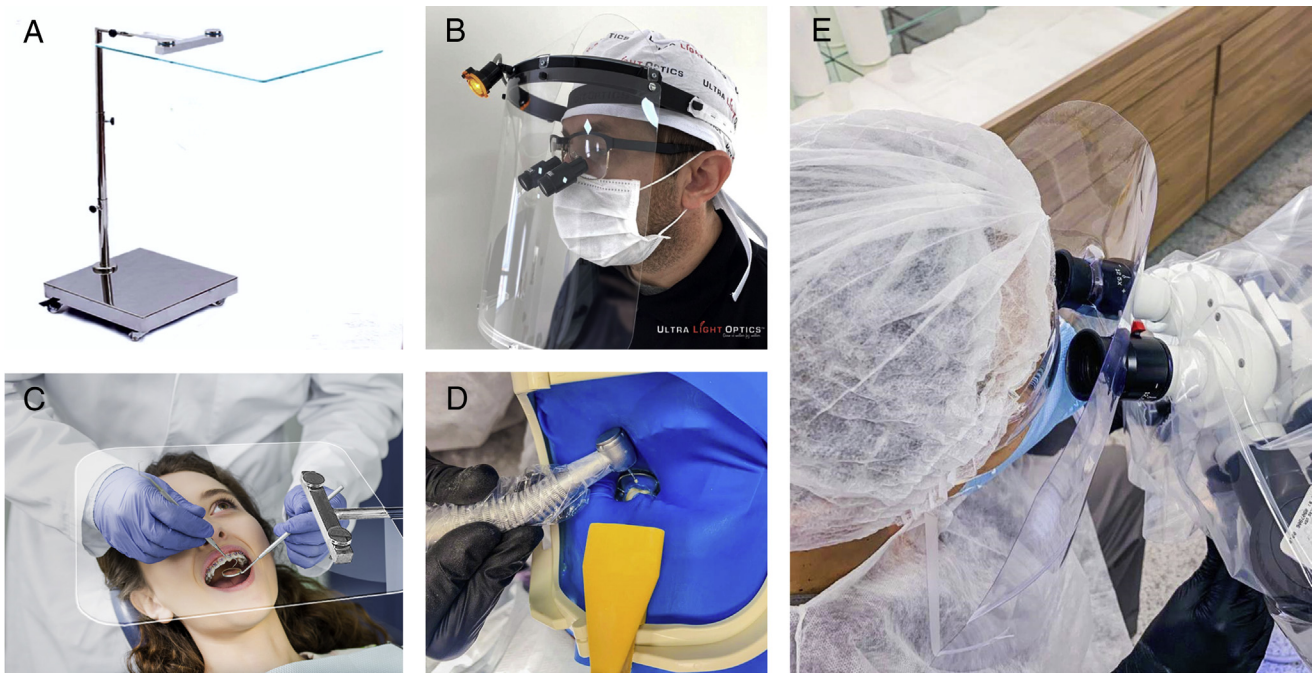


FIGURE 2 – (A and B) An auxiliary table for dental care to minimize aerosol. (C) A face shield adapted for the dental loupe and headlight. (D) A suction device (yellow) designed to decrease aerosol suspension attached to high evacuation suction. (E) Acetate sheets adapted to the binocular of the dental operating microscope.

2. How long has the problem been present?
 - Hardly a true emergency lasts for more than 2 to 3 days, the normal period for an acute inflammatory response.
3. Have you taken any medication? Was it efficient?
 - Generally, the use of analgesics is not effective in the pain of a true emergency.

Based on the interview, in cases of urgency, where treatment is considered elective, drug prescription and monitoring of the patient should be performed. Conversely, in cases of emergencies, the clinician should determine the diagnostic hypothesis, ask for an extraoral image cone-beam computed tomographic examination of the region of interest if needed, and schedule an appointment as soon as possible^{17,22,24}. It is worth mentioning that patients considered to be in a high-risk group should have priority for scheduling. The most common conditions reported as risk factors for COVID-19 were diabetes mellitus, chronic lung disease, and cardiovascular disease²⁵. When scheduled, the patient should be advised to come at the proper time; to wear a mask; to avoid wearing jewelry or accessories; to store his or her mobile phone; and, if possible, to come alone¹⁶.

Considering that the treatment of an endodontic emergency cannot be avoided, the staff should prepare in advance all the materials and equipment to be used in the appointment. The dental team should be

equipped with disposable N95 masks, gloves, caps, shoe covers, face shields, and gowns, following national guidelines. The installation of physical barriers in the waiting room, the removal of magazines or other objects, and the provision of supplies for the storage of the patient's personal belongings are also effective measures to prevent the permanence and spread of the virus during emergency dental care. Reception staff must be properly dressed, wearing masks, goggles, and face shields before patients arrive. Practicing these routines with employees to calibrate the entire care team should be considered^{20,26}.

At the dental office, the patient's body temperature (<100.4°F) should be measured using a noncontact frontal thermometer or cameras with infrared temperature sensors. Patients should be instructed to wash their hands followed by the use of alcohol-based (60%–95%) hand sanitizer. Eye and foot protection supplies can also be provided to minimize the high risk of cross infection. Visual alerts (posters and signs) can be posted in the waiting room for better patient guidance².

Dental appointment schedules should include a safety period between patients in order to minimize possible contact with other patients and to avoid crowding. If strictly necessary, patients should be kept in a waiting room respecting a minimum distance of 6 feet between them^{27,28}. The renewal of indoor air is essential in order to minimize the spread of SARS-CoV-2 as well as other microorganisms. This could be accomplished in a well-ventilated

room or one with a negative pressure unit in which the air is exhausted directly to the outside or filtered before recirculation. The use of a high-efficiency particulate air filtration unit allows unidirectional air flow in which the contaminated air is captured and released to the external environment, preventing it from spreading in the service unit²⁸. Additionally, for dental offices that do not have this equipment, it has been recommended to open the windows²⁷.

Clinical Protocol for the Management of Endodontic Emergencies

The proposed protocol is described in [Figure 1](#) and includes the following:

1. Preprocedural antiseptic mouth rinses, such as those containing povidone-iodine or hydrogen peroxide, may be an additional method to reduce the number of microorganisms in aerosols and drops during oral procedures²⁹.
2. Indicating the 4-handed technique to benefit controlling infection³⁰
3. Do not use a spittoon, which should be closed. The use of saliva ejectors with low or high volume can reduce the production of droplets and aerosol³⁰.
4. Aerosol-generating procedures, such as the use of a 3-way syringe, should be minimized as much as possible³⁰.
5. Extended appointments should be avoided²⁰.

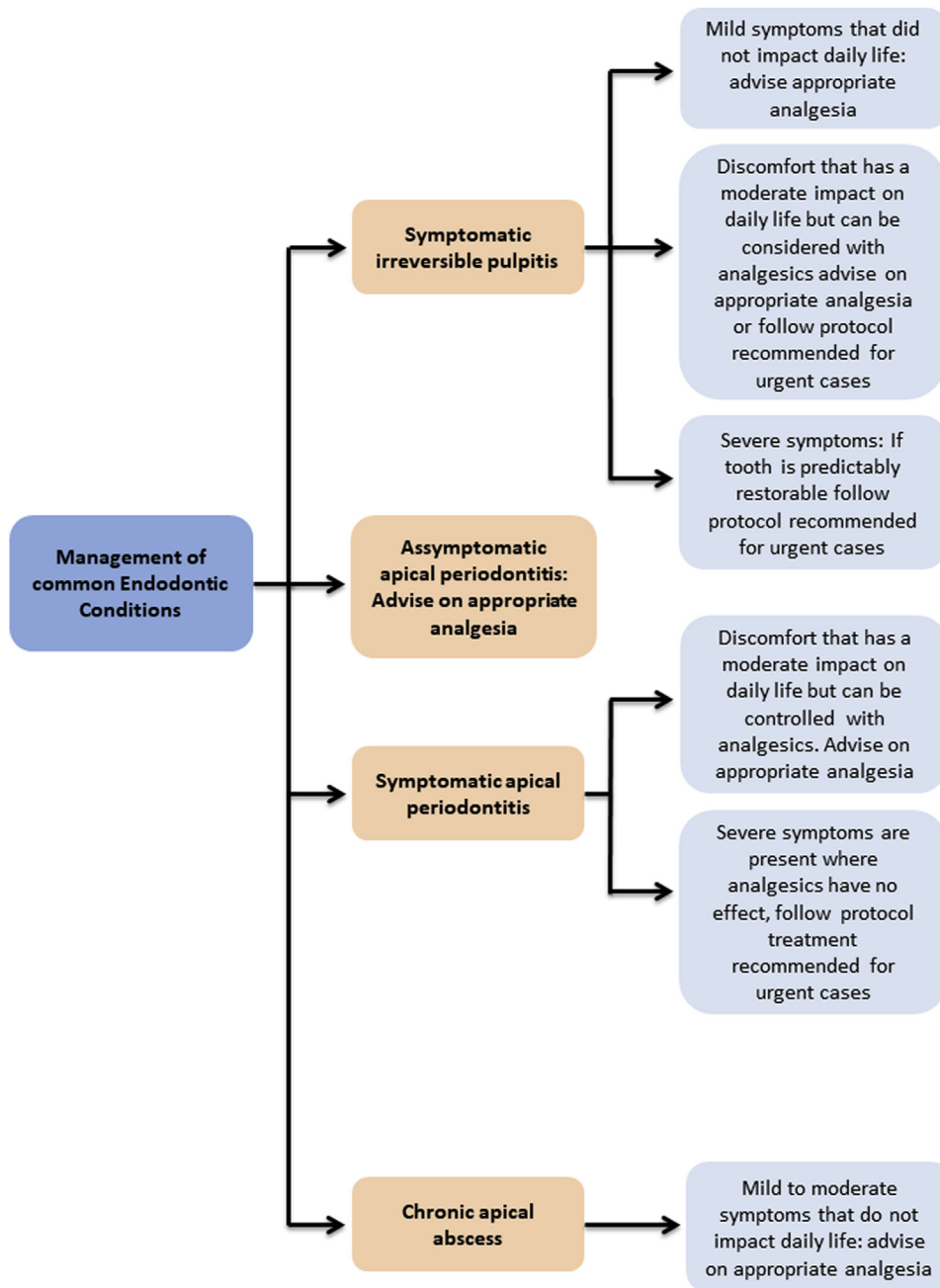


FIGURE 3 – A flowchart of the management of the following common endodontic conditions: symptomatic irreversible pulpitis, asymptomatic apical periodontitis, and symptomatic apical periodontitis.

6. The use of an auxiliary table as a barrier to minimize frontal aerosol is recommended as observed in [Figure 2](#).
7. Anesthetize and isolate the tooth with a rubber dam before starting endodontic access; ideally, isolation should be performed with the clamp on the target tooth, and the rubber dam should cover the patient's nose throughout the endodontic procedure. The Oraseal (Ultradent, Colony, Germany) or OpalDam (Ultradent) should be used

- sparingly to ensure a moisture-tight seal around the tooth³¹.
8. Clean the operative field (tooth, clamp, and surrounding dam) by using 3% hydrogen peroxide and disinfect it with 2.5% sodium hypochlorite³².
9. Access preparation with sterile burs and, if possible, the use of a high-speed handpiece should be avoided and, when necessary, use with no exhaust and with an antireflux valve to prevent contamination in the hoses.

- Reduce the water flow to avoid aerosol spread. Outline the ideal shape access cavity into dentin. Once through the enamel, move to a speed-increasing electric handpiece or a low-speed handpiece to access and expose the entire pulp chamber. Ensure that high-volume aspiration is used as close to the tooth as feasible as noted in [Figure 2](#)³⁰.
10. The use of an ultrasonic device should be avoided as to not generate aerosol

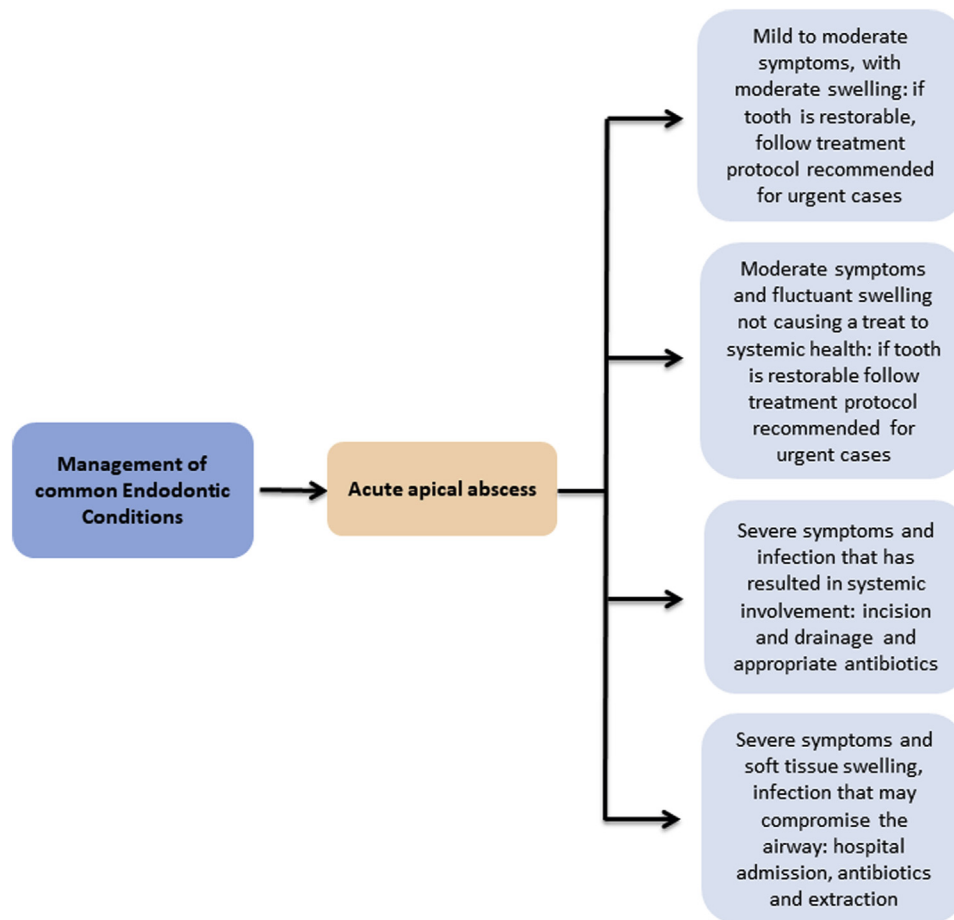


FIGURE 4 – A flowchart of the management of the following common endodontic condition: acute apical abscess.

and droplet spatter. If strongly necessary, use it in association with high evacuation suction, 4-handed dentistry, and a rubber dam²⁰.

11. Application of a powerful air/water surgical suction pump (aspirator) close to the tooth and a second suction close to the nose to prevent aerosol and saliva droplet diffusion³⁰.
12. Once again, clean and disinfect the operative field as described previously³².
13. The dental operating microscope should be used with all the barrier/protection covering the equipment. Acetate sheets could be used as a protective barrier and be adapted to the binocular of the dental operating microscope (Fig. 2). In the case of using a dental loupe and headlight, it can be adapted onto a face shield (Fig. 2).
14. After access cavity, irrigation with sodium hypochlorite is recommended³³.
15. For cases of vital pulp, pulpotomy can be useful in terms of reducing treatment

time with high rates of success in pain control. Facing pulp necrosis or in vital cases in which endodontic preparation is necessary, cone-beam computed tomographic imaging is indicated, avoiding exposing the patient's oral cavity to intraoral radiologic examination, and single-file systems should be preferred, aiming to reduce time and avoiding the risk of reesterilization¹⁷. Select a resistant material for temporary sealing of the tooth and check the occlusion (Figs. 3 and 4).

16. Advise the patient, whenever possible, to avoid chewing on the affected tooth for 24 hours. To manage expectations, inform the patient that the symptoms may take some time to subside. Provide the patient with a prescription for the painkiller of your choice, if necessary³⁴.
17. It is recommended to clean and disinfect all surfaces after each patient in accordance with national guidelines. Employees must wear eye protection, gloves, and a mask when performing

decontamination and disinfection procedures. To facilitate cleaning the office, the clinical area must be kept free of unnecessary equipment and supplies². The Centers for Disease Control and Prevention²⁸ recommends to wait 15 minutes after the completion of each patient to clean and disinfect the dental office. In contrast, the Office of the Chief Dental Officer England³⁵ advises that the rooms should be left vacant with the door closed either for 20 minutes in a negative pressure isolation room or for 1 hour in a neutral pressure room. Also, windows to the outside in a neutral pressure room can be opened.

DISCUSSION

The COVID-19 pandemic led to the need to postpone elective care for endodontic patients to help slow or prevent the spread of the coronavirus. Thus, in the health system, in the first phase of coping with the disease, only care for endodontic emergencies was advised by health authorities. Over time, each

government will determine the best moment for the reopening of dental services, with the proper biosafety criteria already incorporated into the clinical routine². It is essential that endodontists are well prepared for both phases^{16,20}.

Overall, to date, no universal protocol or guideline is available to provide dental care to confirmed or suspected cases of COVID-19. Distinct governments have developed guidelines with their health authorities¹⁶. Certainly, endodontists should regularly consult their state dental boards or other regulatory agencies for specific requirements for their jurisdictions because information is changing rapidly. Proposals for dental care protocols by the scientific community are extremely necessary so that professionals are more secure in providing dental care in the current adverse scenario. This proposed protocol aims to minimize the risks of spreading the virus, guiding professionals on their protection and that of the patient with specific care for before, during, and after clinical care.

Dental management guidance documents from different countries provide information on how to group patients according to a risk assessment of the potential status of COVID-19 (eg, positive for COVID-19, suspected COVID-19, or asymptomatic)^{16,36}. Alharbi et al³⁷ indicated that in cases of endodontic emergency in suspected or confirmed COVID-19 patients, they should be treated in isolation rooms for airborne infections or negative pressure rooms, preferably in a hospital environment. However, the Directorate-General of Health of Portugal recommends considering the patients' symptoms, attending at the private office, scheduling the appointment at the end of the day, and using adequate personal protective equipment for high-risk procedures. In view of this, it is imperative to keep in mind that scientific studies indicate that the COVID-19 incubation period can extend for 14 days, with an average time of 4–5 days from exposure to symptoms^{38,39}. It has been shown that asymptomatic patients or patients during the incubation period may

have potential for transmission⁴⁰. Positive results of the reverse transcription polymerase chain reaction test have also been reported in recovered patients⁴¹. Together, these recommendations and studies provide important insights into the management of endodontic emergencies of patients in private offices during the COVID-19 pandemic. The proposed protocol could contribute to the management of endodontic emergencies at the dental office during the COVID-19 outbreak.

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