

Dental Practice management During COVID-19 Pandemic

Dr.Sadhana Kandavel, Dr.Anita.M², Dr.Vidhya Rekha.U,Dr.Shafiyah.M

1,3 - Senior Lecturer, Department of Public Health Dentistry, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Chennai

2- Reader, Department of Public Health Dentistry, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Chennai

4 – CRI, Department of Public Health Dentistry, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Chennai

Corresponding author

Dr.Sadhanakandavel

Senior Lecturer, Department of Public Health Dentistry, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Chennai

Mail Id: Sadhanakandavel@gmail.com

Phone no: 9840228092

Abstract:

The aim of this article is to provide evidence-based information for the oral health-care providers to understand better about COVID-19 disease and be prepared to treat all the patients. The impact of the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) pandemic has been unprecedented especially in health care, oral healthcare service is one of the most highly exposed clinical departments due to the potential aerosol transmission risk. Since the corona virus disease 2019 (COVID-19) outbreak was declared a pandemic on 11 March 2020, several dental care facilities in affected countries have been completely closed or have been only providing a minimal, treatment for emergency case. Dental specialists in the upcoming days will likely come across patients with confirmed COVID-19 and will have to ensure stringent infection prevention and control to prevent its nosocomial spread. This article strives to provide a brief overview of the etiology, symptoms, and mode of transmission of this novel infection, and how to minimize the spread in a dental healthcare setting, and a brief about dental management practice and protocols prior to patients visit, during in-office dental treatment, post-treatment, during the pandemic and after.

Keywords: COVID-19, Pandemic, Dental Practice, Management

INTRODUCTION:

Pandemic is defined as an epidemic occurring worldwide, or over a very wide area, and also crossing international boundaries and usually affecting a large number of people especially the oral health care workers.¹In the early December 2019, people in Wuhan province of China reported with an atypical respiratory disease, which rapidly spread to become a major challenging public health problem for not only China but also the countries around the world.²On January 30, 2020, the World Health Organization (WHO) announced that this outbreak had constituted a public health emergency

of international concern. The novel coronavirus was initially named 2019-nCoV and officially as severe acute respiratory syndrome coronavirus (SARSCoV-2). As of February 26, COVID-19 has been recognized in 34 countries, with a total of 80,239 laboratory-confirmed cases and 2,700 deaths.³As of June 5, 2020, according to the World Health Organization (WHO), 2019-nCoV has involved 216 countries, over 6 million confirmed cases, and 387,154 confirmed deaths.⁴The Corona Virus Disease 2019 (COVID-19) pandemic brings great challenges to global public health.⁵ This article is based on the experience and relevant guidelines and researches which gives an essential knowledge about COVID-19 infection in dental care settings and provides recommendations and management protocols for dental practitioners and students in affected areas.^{3,6}It is very important for health-care providers to take appropriate measures to minimize the risk of infection to their patients, themselves, and other members of the dental team.⁷

Mode of transmission:

The mode of transmission is via respiratory droplets and contact transmission by both symptomatic patients and asymptomatic patients.⁸ These infected droplets can spread 1-2 meters and get deposited on the surfaces. The virus can remain viable on surfaces for days in favorable atmospheric conditions. The main route of human-to-human transmission is by droplets. Infection is acquired either by inhalation of these droplets or touching surfaces contaminated by COVID-19 positive patients which are generated during coughing, talking, or sneezing and are then inhaled by a healthy individual.⁸ They can also be indirectly transmitted to a person when they contact on surfaces that are touched by a healthy individual who may then touch their nose, mouth, or eyes, allowing the virus entry into the body but are destroyed in less than a minute by disinfectants.^{1,9,10} Aerosol-based transmission of the virus has also been confirmed. Stool-based transmission via the fecal-oral route may also be possible since the SARS-CoV-2 has been found in patient feces. In some patients with COVID-19 tend to develop diarrhea, which can become a major route of transmission if proper sanitation and personal hygiene needs are not met.¹¹

Clinical Features:

After an incubation period of approximately 5.2 days the symptoms of COVID-19 infection appears.¹² The period from the onset of symptoms to death ranged between 6 to 41 days with a median of around 14 day, which is mainly dependent on the age of the patient and the immune status of the individual.¹³ Risk is more among patients above 70-years old compared with those under aged and patients with severe underlying medical condition is more prone to COVID-19. The most common symptoms are fever, cough, and fatigue, Sputum production, headache, hemoptysis, diarrhea, dyspnea, and lymphopenia may also be seen in a very few early reported patients.¹⁴ In recent studies it has been stated that sudden loss of smell or taste can also be considered as symptoms of being diseased with COVID-19.¹⁵ However, severe cases lead to pneumonia, kidney failure or even death.¹³ In general, older age and the existence of underlying comorbidities (e.g., diabetes, hypertension, and cardiovascular disease) were associated with very poorer prognosis.¹⁶

Infection Control in Dental Clinic:

All the procedures are done with the care provider or a dental assistant while operating in close proximity to the patient.⁸

The standard protective measures in a daily clinical work is not effective to prevent the spread of COVID-19 extra preventive measures should be followed, especially when patients are in the incubation period, and are unaware they are infected, or simply choose not to reveal their infection.⁵

The greatest risk in COVID-19 is transmission to healthcare workers.¹⁴

Cleaning and disinfection and sterilization of the reception, waiting area, and equipment must be ensured¹⁷ including door handles, chairs and restrooms of the dental clinic is recommended.

Additional application of a portable high-efficiency particulate air (HEPA) filter may be considered, which is commonly present in air-purifiers.

Wall mounted ultraviolet germicidal irradiation (UVGI) devices are being used which offers effective filtration against fungi, viruses and bacteria including tubercle bacilli and anthrax.¹⁸

Before start of everyday practice, reduce the bioburden by mopping the floor and clinic area with a regular disinfectant. Do a second round of general clinic area disinfection with water containing 2% sodium hypochlorite Separate waste disposal into appropriate color coded bags and hand over to designated bio medical waste disposal authorities

Avoid use of closed air circulation systems. Maintain ventilation through partial opening of windows and doors. All nonessential items such as dental display models, brochures, and magazines should be removed, and chairs in the waiting area should be placed 6 feet(1.83m) apart.

Pre- dental Visit Preparation:

Dentistry via phone either in audio or video call is known as teledentistry. Tele dentistry which includes tele screening, tele consulting is highly encouraged with telephone screening is aimed to be the first point of contact between the patient and the dentist.

Detailed medical history must be considered, regarding any symptoms of COVID-19 (fever, cough, shortness of breath, sore throat, runny nose, diarrhea, lethargy, rashes of skin, and loss of taste and smell) must be investigated via phone, and in case of any positivity dental care should be delayed for 3 weeks except in case of dental emergencies.¹⁹

Teleconsultation via a live video is helpful in sharing health information such as radiographs and photographs through a secure electronic communications system with the practitioner to evaluate the patient's condition.²⁰ If needed, patients can be prescribed analgesics, antibiotics or topical agents via a tele dentistry appointment itself.

Do not prescribe any medications for patients with COVID-19 symptoms, must be quarantined if needed. Make digital payment options available.

Dental Visit Preparation:

A detailed history of patient is a must who has history of recent travel to any epidemic regions or has been quarantined for 14 days along with fever, cough, sneezing, or any COVID-19 related symptoms or contact with any close family member who is confirmed with the infection is immediately advised to undergo medical examination and referred to designated hospitals and must not continue with the dental treatment.²¹

If the test results positive, the appointment must be postponed for at least 14 days and should be reported. If the test results negative, patient can have access to the operating area. A negative pressure isolation room should be allocated for the treatment of any suspected COVID-19 patients to minimize the exposure of patients and staff.²²

Patients and their accompanying persons are provided with medical masks, disposable plastic gloves hand sanitizer. Monitoring temperature and checking of oxygen saturation level once the patient enters the dental hospital

Ask patients to arrive on time for their appointments to minimize amount of time spent in waiting room.²³

Patients should be called or texted about their appointment and informed about the details of screening and dental protocol.²⁴

In human coronavirus can survive on inanimate surfaces up to 9 days at room temperature. Therefore, after each patient treatment, environmental cleaning and disinfection procedures by chemicals

approved for COVID-19 is mandatory. Alternatively, patients could be treated in an isolated and well-ventilated room or negatively pressured rooms if available for suspected cases with COVID-19.

Operatory preparation:

- a) Operators standing at the front office should communicate with patients maintaining at least 1 m distance, preferably through a protective screen.²⁵
- b) Monitor temperature and oxygen saturation level for staffs, assistants and doctors on a daily basis Work on rotation basis with 2-3 days off in between if more than one doctor/assistant available. Use surgical protective clothing in clinic. Avoid general clothing for dentist and assistant.
- c) Designate separate donning and doffing area for personal protective equipment (PPE).
- d) Dental assistants must be aware on patient management and infection control procedures.
- e) Good personal hygiene rules is an essential requirement. A shower before going to work and after activities will certainly be a recommended practice.²⁶
- f) Operators are advised to shave facial hair, to keep the fingernails short, and avoid the use of any accessories such as bracelets, necklaces, rings, bangles and watches.²²

Hand hygiene:

- a) Hand hygiene reduces the risk of transmission of infection as soap and detergent cut the virus's fatty outer layer and is more effective than use of hand sanitizers alone.²⁷
- b) Rinse hands thoroughly with running water, dry properly with a disposable towel, and use the disposable towel to close the tap.
- c) It is also recommended to moisturize after continuously washing, to improve the barrier protection function of skin.
- d) Patients should also be asked to perform hand hygiene with alcohol based hand sanitizers on entry into the clinic, entry into the operatory, and again after the dental procedure.²⁸
- e) 80% ethanol or 75% 2-propanol as an Alcohol-Based Hand Rub (ABHR), against SARSCoV2, were found to be efficient. Hence, in dental practice, their use should be highly encouraged, and hands must be washed whenever visibly soiled.²⁹

Personal Protective Equipment (PPE):

- a) The use of personal protective equipment, including masks (e.g., N-95, FFP2 or FFP3 mask, protective goggles, full-face shield or side shield, hair covers/hoods double gloving technique with long sleeved gloves are highly recommended to protect skin, face and mucosa from infected blood that tend to splash during routine dental practice and during aerosol generating procedures on confirmed or suspected COVID-19 patients.
- b) The operator is fully equipped, it is crucial not to touch surgical mask, surgical cap and goggles, in order to keep the field sterile.
- c) There are found to be different levels of mask according to the American Society for testing and Materials (ASTM):
 1. Level 1 masks have the least fluid resistance, particulate efficiency, bacterial filtration efficiency and breathing resistance. These can be worn for procedures where low amounts of fluid, spray or aerosols are produced, for example consultation, patient evaluations, orthodontic visits or operatory cleaning.
 2. Level 2 masks moderately provide a barrier for fluid resistance, bacterial and particulate filtration efficiencies and breathing resistance, these can be used for procedures producing moderate to light amount of fluid, spray or aerosols. Some examples of procedures are sealant placement, simple restorative or composite procedures or endodontic treatments.
 3. Levels 3 masks provide high level of fluid resistance and these are designed for procedures with moderate to heavy amounts of blood, fluid, spray or aerosol exposure, some of the

examples are complex oral surgery, crown or bridge placement, implant placement or use of ultrasonic scalers.³⁰

Mouth rinse:

- a) Mouthrinse with oxidative agents is considered to minimize the viral load⁵, thus helping in the reduction of aerosols and salivary pathogens concerned with SARS CoV2.
- b) Before starting any procedure, give the patient a mouthwash containing 0,2% povidone-iodine or 1% hydrogen peroxide rinse which has viricidal activity could be beneficial in reduction of oral and respiratory pathogens for 1 minute, then a mouthwash with 2% chlorhexidine for 1 minute; reduces bacterial load due to its bacteriostatic and bactericidal activity.³
- c) During mouth rinsing, patients must not gargle and should expel mouthwash in the sink.
- d) Other mouthrinses with chlorhexidine, cyclodextrins and amphiphilic-cyclodextrin may prove to be beneficial but require further studies.

Oral Examination:

- a) Aerosol-generating procedures, such as the use of a 3-way syringe, ultrasonic instruments and highspeed handpiece should be minimized as much as possible decreases possible exposure to infectious agents. Use of disposable devices such as mouth mirror, syringes and blood pressure cuff to prevent cross contamination.
- b) Use of rubber dams and high-volume saliva ejectors can reduce the production of also avoids spraying.³
- c) During the outbreak of COVID-19, procedures that are likely to induce coughing could be avoided if possible or performed judiciously.
- d) Intraoral periapical radiograph examination is the most common procedure which sometimes can stimulate saliva secretions, gag reflex and coughing. This can be minimized by extraoral dental radiographies, such as panoramic Orthopantomogram (OPG) or cone beam CT (CBCT).³¹
- e) In some cases of asymptomatic COVID-19 carriers, the virus may be residing in the salivary gland, hence all patients should be considered as carriers.
- f) Life-threatening cases such as oral and maxillofacial fractures or injuries should be admitted to the hospital immediately, and a precautionary chest CT should be done.
- g) If indispensable, electric friction grip handpieces must be used to prevent debris and fluids getting expelled or aspirated.
- h) Low- or high-volume suction can minimize aerosol production considerably. If restorative treatment is required.²⁷
- i) For restorations, silver diamine fluoride, biological restoration, and GIC can be utilized In case of acute pulpitis, periapical periodontitis, dental and orofacial trauma and infections, or any other dental emergency, patients and guardians should visit dental clinics with appropriate personal protection.¹³

Emergency and Non-Emergency Dental Treatment

Only dental emergencies should be undertaken that to only after having taken all the necessary precautions. Some examples of urgent dental care treatments, which should be treated as minimally invasively as possible, includes:

- a) Severe dental pain from pulpal inflammation³⁴
- b) Surgical postoperative osteitis or dry socket dressing changes.
- c) Abscess or localized bacterial infection resulting in localized pain and inflammation.
- d) Secondary caries causing pain.
- e) Grossly decayed tooth resulting in pain and swelling.

- f) Pericoronitis or third-molar pain.
- g) Tooth fracture resulting in pain or causing soft tissue trauma.
- h) Dental trauma with avulsion/luxation.
- i) Replacing temporary filling on endo access openings in patients experiencing pain.
- j) Dental treatment cementation if the temporary restoration is lost, broken or causing gingival irritation.
- k) Replacing temporary filling on endo access openings in patients experiencing pain.

Nonemergency dental procedures, includes:

- a) Restorative dentistry including treatment of asymptomatic carious lesion.
- b) Initial or periodic oral examinations and recall visits, appointment visits including routine radiographs.
- c) Crown cementation other than those teeth causing pain.
- d) Routine dental cleaning and other preventive therapies.
- e) Polishing procedures.
- f) Orthodontic procedures other than those to address acute issues (e.g., pain, infection, trauma).
- g) Extraction of asymptomatic teeth.
- h) Restorative dentistry including treatment of asymptomatic carious lesions.
- i) Aesthetic dental procedures.
- j) Cosmetic dentistry.

Post-Treatment:

Post-procedure disinfection and decontamination: all sterilizable instruments should be cleaned, disinfected, and sterilized expediently, while all disposables, whether used or not, should be presumed to be infected and discarded appropriately³². Autoclaving of handpieces after each patient is mandatory.

Disinfect surfaces after each patient visit, hospital disinfectant including ammonium based, phenol based, and alcohol-based products are effective against coronavirus (Wenzel RP, Edmond MB)

Doffing of PPE is an appropriate doffing sequence and disposal in designated bags should be followed as per local biomedical waste protocols.

Glasses and face-shields must be washed and disinfected after each procedure.

ABHR must be used after each patient.

Follow-up of all patients must be followed up after 7 days for any flu-like symptoms. An in/out daily log book needs to be maintained as to who all entered and left the clinic along with the date and time.

Patients previously suffering from COVID-19 who have completed home isolation clearance can receive emergency dental care after fulfilling the latest CDC guidelines.³³

CONCLUSION:

Dental healthcare professionals have actively participated in the disease control. To maintain a safe practice environment all dental practitioners should follow additional precautionary measures so as to be able to face any such contagious disease in the future. COVID-19 pandemic is an unexpected challenge to the dental practitioner and will leave its mark on clinical practice management. Oral health institutions, hospitals and clinics are slowly recovering from the pandemic control. Budding dentists and experienced practitioners need to rework their approach to patient management from the lessons learned in this period of the pandemic.

REFERENCES:

1. Saeralaathan S, Balaji SK, Lavu V. Dental practice management and research during the COVID-19 pandemic- An overview. J Anal Pharm Res. 2020;9(3):91-95.

2. Phelan AL, Katz R, Gostin LO, Kanwar Deep Singh Nanda, Thenovel coronavirus originating in Wuhan, China: challenges for global health governance. *JAMA* 2020; 323(8): 709-10.
3. Jasmine Nanda2 Coronavirus disease Situation Report - 35 Feb 26 2019, Recommendations and Management in Dental Practice during Corona Virus COVID-19, *The Open Dentistry Journal*, 2020, 14, 191-193
4. Li L, Ren MJ, Zhang YY. Lung,CT image of a confirmed case of the 2019 novel coronavirus (2019-nCoV) infected pneumonia (With differential diagnosis of the SARS). *YixueXinzhi*. 2020;30.
5. Meng L, Hua F, Bian Z, Coronavirus Disease 2019 (COVID19): Emerging and Future Challenges for Dental and Oral Medicine. *J Dent Res* 12: 22034520914246. [Crossref]
6. Kanwar Deep Singh Nanda Recommendations and Management in Dental Practice during Corona Virus COVID-19 *The Open Dentistry Journal*, 2020, Volume 14 191-193
7. Behzad Mostoufi , Zack Ashkenazie , Jamaad Abdi , Elizabeth Chen, Louis G. De Paola) COVID-19 VS The dental profession: Establishing a safe dental practice for the coronavirus era, . *J Global Oral Health* 2020;3(1):41-8.
8. Somar Mirinal, Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G et al. (2020) An Interim Report on the Dental Practice Management: COVID-19 *Journal of Dentistry Open Access JDOA*.2020.01.01 Volume 2(1): 2-4
9. Keni R, Alexander A, Nayak PG, et al. COVID-19: Emergence, Spread, Possible Treatments, and Global Burden. *Front Public Heal*. 2020;8.
10. KampfG, Todt D, Pfaender S, Steinmann E Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect*. 2020 Mar; 104: 246-251. doi: 10.1016/j.jhin.2020.01.022.
11. Rothan HA, ByrareddyS . The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *J Autoimmun*. 2020;109:102433.
12. Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *N Engl J Med*. 2020;382(13):1199–207.
13. Wang W, Hu H, Song L Image of pulmonary and diagnosis of atypical novel coronavirus (2019-nCoV) infected pneumonia: case series of 14 patients. *YixueXinzhi*. 2020;30
14. Carlos WG, Dela Cruz CS, Cao B, et al. Novel Wuhan. Coronavirus disease 2019 Situation Report – 41 [WWW Document]. *World Heal. Organ*. <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200301-sitrep-41-COVID-19.pdf> (accessed 3.29.20).
15. Gautier JF, Ravussin Y e severe acute respiratory syndrome coronavirus-2 (SARS CoV-2) in dentistry. Management of biological risk in dental practice,” *International Journal of Environmental Research and Public Health*, vol. 17, no. 9, p. 3067, 2020.
16. Chen N, Zhou M, Dong X , Huang C, Wang Y, Li X Recurrence of positive SARS-CoV-2 RNA in COVID-19: a case report. *J. Infect. Dis. Int*. <https://doi.org/10.1016/j.ijid.2020.03.003>.
17. G. Cervino, M. Matarese et al e SARS-CoV-2 outbreak: diagnosis, infection prevention, and public perception,” *Clinical Chemistry*, vol. 66, no. 5, pp. 644–651, 2020
18. Brickner PW, Vincent RL, First M, Nardell E, Murray M et al The application of ultraviolet germicidal irradiation to control transmission of airborne disease: bioterrorism countermeasure. *Public Health Rep* 118: 99-114. [Crossref]
19. Anuraj Singh Kochhar, A. Ather, B. Patel, N. B. Ruparel, D. Maret, O. A. Peters, F. Vaysse, and E. Vigaros). COVID-19 Pandemic and Dental Practice *Hindawi International Journal of Dentistry* Volume 2020, Article ID 8894794, 5 pages <https://doi.org/10.1155/2020/8894794>
20. L. Fiorillo, G. Cervino, M. Matarese et al., “COVID-19 surface persistence: a recent data summary and its importance for medical and dental settings,” *International Journal of Environmental Research and Public Health*, vol. 17, no. 9, p. 3132, 2020.
21. Wang D, Hu B, Hu C Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *JAMA*. 2020 Feb; 7: e201585. doi: 10.1001/jama.2020.1585
22. Ather, B. Patel, N. B. Ruparel, A. Diogenes, and K. M. Hargreaves, “Coronavirus disease 19 (COVID-19): implications for clinical dental care,” *Journal of Endodontics*, vol. 46, no. 5, pp. 584–595, 2020.

23. Meng L, Hua F, Bian Z Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. *J Dent Res.* 2020 Mar 12:22034520914246. doi: 10.1177/0022034520914246.
24. M. Matarese et al M. Severe acute respiratory syndrome and dentistry: a retrospective view. *J Am Dent Assoc.* 2004 Sep; 135: 1292–1302. doi: 10.14219/jada.archive.2004.0405.
25. Spicciarelli V, Marruganti C, Viviano M, Baldini N, Franciosi G, Tortoriello M, Grandini S. Prevention and safety in the dental office after Novel Human Coronavirus outbreak: unresolved questions and future directions. *J Osseointegr* 2020;12(2):145-153.
26. Matteo Peditto , Simone Scapellato, Antonia Marciano , Paola Costa and Giacomo Oteri Dentistry during the COVID-19 Epidemic *Int. J. Environ. Res. Public Health* 2020, 17, 3325
27. N. Van Doremalen, T. Bushmaker, D. H. Morris et al Health Care Infection Control Practices Advisory Committee. Guideline for isolation precautions: Preventing transmission of infectious agents in health care settings. *Am J Infect Control* 2007;35:S65-164.
28. M. Tortoriello, S. Grandini) Transmission of COVID-19 Infection from an Asymptomatic Contact in Germany. *N Engl J Med.* 2020 Mar; 382: 970-971. doi: 10.1056/NEJMc2001468.
29. KK Tsang OT Consistent detection of 2019 novel coronavirus in saliva. *Clin Infect Dis.* 2020 Feb 12: ciaa149. doi: 10.1093/cid/ciaa149
30. D M. D. Christian. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *JAMA.* 2020 Feb; 7: e201585. doi: 10.1001/jama.2020.1585
31. Vandenberghe B) Modern dental imaging: a review of the current technology and clinical applications in dental practice. *Eur Radiol* 20: 2637-2655. [Crossref]
32. H. J. Kim, J. S. Ko, and T.-Y. Kim) A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus [2019-nCoV] infected pneumonia (standard version). *Mil Med Res* 7: 4. [Crossref]
33. Gulsheen Kaur Kochhar and Himanshu Dadlani) Johns Hopkins ABX Guide. United States: The Johns Hopkins University; 2020. Available from: http://www.hopkinsguides.com/hopkins/view/johns_hopkins_abx_guide/540747/all/coronavirus_covid_19_sars_cov_2_.
34. Beeley JA, Yip HK, Stevenson AG) Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20-28 January 2020. *Euro Surveill* 2020;25:2000062.