

# The Ideal Treatment in Dentistry during Covid-19 Pandemic

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## ABSTRACT

A new outbreak of COVID-19 disease caused by a severe acute respiratory syndrome known as SARS-CoV-2 was reported on late December 2019. In March 2020, 1,528 confirmed cases of COVID-19, and 136 instances died in Indonesia. Europe and North America, with cases now surpassing China, have been declared the center of the COVID-19 pandemic. As of March 2020, the United States ranked first (with almost 20,000 new cases), followed by Spain (with 7,000 new cases). Meanwhile, Italy has declared the country with the most substantial evidence of death due to COVID-19 in the world. Thus, the world health organization (WHO) improves the status of the COVID-19 pandemic. Occupational Safety and Health Administration publishes notes about workers who could be at risk of COVID-19 exposure, divided into four levels of risk. Very high-risk exposure levels include work that has a high potential for exposure with COVID-19, such as medical procedures or laboratory procedures. Most health workers are considered as the high-risk exposure.

**Keywords:** COVID-19, Dentist, Pandemic

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## BACKGROUND

A new outbreak called COVID-19 broke on late December 2019. Until the end of March 2020, COVID-19 cases in Indonesia have risen to 1,528 cases, and 136 of them died. Meanwhile, Europe and North America, with many instances exceeding China, are declared the center of the COVID-19 pandemic. As of March 2020, the United States ranked first (with almost 20,000 new cases), followed by Spain (with 7,000 new cases). Meanwhile, Italy has declared the country with the highest instance of death due to COVID-19 in the world (approximately 11.3% of cases).<sup>1,2,3</sup>

The typical clinical symptoms of a COVID-19 patient are fever, dry cough, difficulty breathing (dyspnea), headache, and pneumonia. However, this disease can trigger progressive respiratory failure due to alveolar damage and even death.<sup>4,5</sup>

Based on level of risk, Occupational Safety and Health Administration (OSHA) divided workers into four levels of COVID-19 transmission risk. Very high-risk exposure levels include work that has a high potential for exposure with COVID-19 during medical and laboratory procedures, such as dentists, include in this category.<sup>6</sup>

The risk of COVID-19 exposure in dentist practitioners should not be underestimated. During dental care procedures, many aerosols produced by the high-speed handpiece, water syringe, or ultrasonic scaler, when dentists performed a procedure on patients with COVID-19. Therefore, the dentists need to improve their prevention strategies to avoid COVID-19 infection.<sup>6,7</sup>

## Definition of COVID-19

Severe acute respiratory syndrome coronavirus 2, (SARS-CoV-2), a member of the Coronaviridae family and the Nidovirales sequence, are RNA viruses that are not segmented, positively enveloped, and widely distributed in humans and other mammals. Examples of coronaviruses have caused more than 10,000 cumulative cases in the last two decades are SARS-CoV and MERS-CoV, with mortality rates of around 10% and 37%, respectively. Identified coronaviruses may be just a few of many coronaviruses types out there, and most

coronavirus infections tend to be mild, epidemics of the two previous beta coronaviruses. Coronaviruses had capsules, round or elliptical particles, often pleomorphic with a diameter of about 50-200 nm. S protein or spike protein on the coronavirus structure, which played a role in the virus's attachment and entry, was one of the main antigen proteins of the virus and the main structure in writing genes. Virions were mostly spherical, with glycoprotein (S) bound in envelopes.

Coronavirus is a heat-sensitive virus and effectively can be deactivated by disinfectants containing chlorine, lipid solvents with a 56°C temperature for 30 minutes, ether, alcohol, peroxyacetic acid, non-ionic detergents, formalin, oxidizing agents and chloroform that are proved be effective in deactivating viruses compared with chlorhexidine which is not effective in deactivating viruses.<sup>7,9</sup>

## Stability of COVID-19 Virus

Based on in vitro research that discusses the SARS-Cov-2 persistence aft on a surface such as plastic or stainless steel shows that the virus has remained stable for up to three days on a plastic cover and up to two days on a stainless steel surface, the number of illnesses has increased significantly and this is not sufficient to cause infection. A dry environment has the highest possibility of damaging the stability of the virus, and alcohol-based disinfectants considerably reduce the infectivity of the enveloped viruses like COVID-19.<sup>6</sup>

## Transmission of COVID-19

As has been widely discussed in several kinds of literature, the 2019-nCoV transmission route is droplets with particle diameters up to  $\geq 5 \mu\text{m}$ , which can be produced from coughing or sneezing of infected patient's direct contact with the mouth, nose, and eyes droplets. A study in Hong Kong showed that coronavirus was present in saliva, which proved that 11 of 12 patients were infected (or about 91.7%). But the results of the study demonstrate that the transmission of the coronavirus cannot be through the air, including SARS-CoV-2.<sup>6</sup>

### Clinical manifestation of COVID-19

The incubation period of this virus is up to six days, and the period from the onset of symptoms to death ranges from 6 to 41 days, depending on the age of the patient and the status of the patient's immune system. Patients aged over 70 years are more high risk than patients under 70 years.<sup>10</sup> Typical clinical symptoms that occur in COVID-19 patients were fever, cough, malaise, dyspnea, and pneumonia. Therefore, in addition to spreading the virus through oral secretions and injections, issuing fecal-oral transmission is also involved.<sup>1,11,10</sup>

### Risk Factor for COVID-19

Based on the data, people with comorbidities were at high risk for COVID-19 infection. Inpatient who are smokers, or have comorbidities like hypertension, and diabetes mellitus, were suspected of an increase in ACE2 receptor expression.<sup>2</sup> There was a study reporting that consumers of ACE inhibitors (ACE-I) or angiotensin receptor blockers (ARBs) were at risk of more severe COVID-19. Related to this allegation, the European Society of Cardiology (ESC) confirmed that there was no conclusive evidence to conclude the positive or negative benefits of drugs of ACE-I or ARB, so users of both types of these drugs should continue their treatment. Cancer patients and chronic liver disease were more susceptible to SARS-CoV-2 infection. Cancer is associated with immunosuppressive reactions, excessive cytokines, suppression induction of pro-inflammatory agents, and impaired dendritic cell maturation. Patients with cirrhosis or chronic liver disease also decreased immune response, so it was more accessible to infected COVID-19 and can be worse outcomes. Study Guan, et al. found that of the 261 COVID-19 patients who had comorbidities, 10 of them were with cancer and 23 with hepatitis B. Acute respiratory tract infections that affected HIV patients generally had a higher mortality risk than patients without HIV. However, to date, there have been no studies linking HIV with SARS-CoV-2 infection. The relationship of SARS-CoV-2 infection with hypersensitivity and autoimmune disease has also not been reported. No reviews were connecting the history of asthma with the possibility of being infected with SARS-CoV-2. However, COVID-19 patients with a history of respiratory system disease tend to have more severe clinical manifestations. The Centers for Disease Control and Prevention (CDC) has announced several other risk factors such as close contact, living with COVID-19 patients and travel to the affected area as a factor causing transmission of this virus. Being within a 2-meter radius is also considered to be a low risk of transmitting this virus. One of the high-risk populations in transmitting this virus is medical personnel. More than 3,300 medical personnel are also infected in China, with a mortality rate of 0.6%.<sup>2</sup>

### Prevention of COVID-19 on Dentist

Practical prevention efforts to reduce transmission of COVID-19 are significant, especially for dentists who have a high risk of transmission of this virus. However, identifying infected patients is a considerable challenge for dental practitioners because appropriate diagnostic patterns are needed. Therefore, each patient needs to be treated as an infected patient to avoid any risk.<sup>6,12</sup> Some patients who have severe respiratory conditions such as transplant patients, cancer patients, and congenital diseases, patients who are undergoing immunosuppression therapy, pregnant women and heart

disease (congenital or acquired) are patients at risk of contracting. As well as cancer survivors, people suffering from chronic diseases with chronic health conditions and AIDS or drugs, body mass index (BMI) 40 or more) also fall into this category.<sup>6,12,13</sup>

### Management of COVID-19 during the pandemic

During the pandemic COVID-19 in China, the need for dental care declined to 38%. This figure is still quite high and proves that urgent dental care during the pandemic is still quite significant. Dental associations in various countries have different actions and actions related to dental services during the pandemic, from closing the practice to reducing the number of services. There are no regulations from various institutes or regulators of dental care policies during the pandemic. This can be due to the number or spread of COVID-19 varies in different parts of the world.<sup>13</sup>

### DISCUSSION

COVID-19 was a new type of coronavirus, this epidemic has found in Wuhan, this infectious disease caused by SARS-Cov-2. This virus can be transmitted through saliva and droplets when an infected patient coughs or sneezes (at a distance of about 6 feet) and if it touches the surface contaminated with this virus<sup>15</sup>. According to Ruoshi Xu, study, SARS-Cov-2 transmission mostly occurs in confined spaces, ie, anyone within 1 m with confirmed cases in the symptomatic period, starting from 4 days before the onset of symptoms.<sup>16?</sup>

Symptoms of COVID-19 infection are divided into three categories, namely mild, moderate, to severe symptoms. In severe cases, the symptoms that occur are acute respiratory distress syndrome, septic shock, metabolic acidosis, and bleeding system dysfunction or clotting within a few days. The prognosis of COVID-19 patients varies, ranging from an excellent prognosis to critical conditions and even death. The following clinical syndromes can occur if infected: A. Uncomplicated pneumonia: it was the mildest condition. Symptoms were not specific; the main symptoms still appear, such as fever, cough, can be accompanied by throat pain, nasal congestion, malaise, headache, and myalgia. It should be noted that in elderly and immunocompromised patients, the percentage of symptoms becomes non-typical or atypical. Besides, in several cases that were found not accompanied by fever and relatively mild symptoms. In this condition, the patient has no signs of complications, including dehydration, sepsis, or dyspnea. B. Mild pneumonia: significant symptoms can occur, such as fever, cough, and dyspnea but no signs of severe pneumonia in children with non-severe pneumonia characterized by a cough or breathing difficulties. C. Severe pneumonia, in adults: 1. symptoms include fever or suspect respiratory tract infection, 2. signs are tachypnea <90% outside air.<sup>17</sup>

So far, there are no facts that prove the existence of transmission of SARS-CoV-2 that occurred in dental clinics. However, these teeth need to be aware of SARS-CoV-2 communication because they consider dental care very risky to be contaminated with saliva, and equipped with devices and equipment as a result of aerosols and can contact at risk of contamination at-risk high in the dental clinic. As needed, during the COVID-19 epidemic, changes in dental care measures need to be adjusted and made to prevent and prevent transmission of the virus.<sup>12</sup> As we know, most dental restoration, prosthetic and periodontal procedures are considered non-emergency,

so they can be postponed until the pandemic gets better. Nevertheless, some dental problems require immediate treatment, even during epidemics.<sup>6</sup>

During COVID-19, the worldwide dental association, the American Dental Association, announced the new regulation toward urgent dental treatment divided into<sup>6,13</sup>

1. Dental emergencies (potentially life-threatening)
2. The urgent conditions that need emergency care to alleviate pain and reduce infection risk within 24 hours
3. Undeferrable treatments (last more than 24 hours).

Therefore, private dental clinics must implement new rules regarding the prevention of the spread of the COVID-19 virus in the work environment. All staff (without exception) are required to follow standard precautions; even all operators also follow these rules. The most important thing is that all staff are required to maintain personal hygiene and cleanliness of the work environment, one of them is by taking a shower before leaving for work and after doing activities, washing hands with soap, or always doing hand rub with alcohol-based hand sanitizer for at least 20 seconds, limiting contact with surfaces, computer, and other objects around. Besides, all staff (especially doctors) are prohibited from touching their faces, including moving their eyes, nose, and mouth. The dentist's office must be sterilized, and the dentist must wear a level 3 standard personal protective equipment.<sup>3,6,13</sup>

## CONCLUSION

This literature review aims to share knowledge from various references regarding operator, patient, environment, instrument management, and understanding the dental environment in COVID-19 transmission may reduce the risk of infection. In reducing the possibility of transmission, it is necessary to clean up the work and home environments that are considered at risk of becoming a place of COVID-19 transmission and sterilize instruments, take appropriate precautions in inpatient and operator management.

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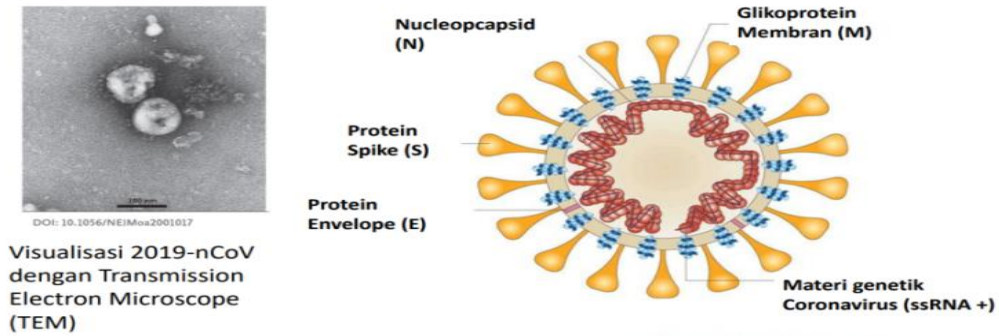


Figure 1. The structure of *Coronavirus*

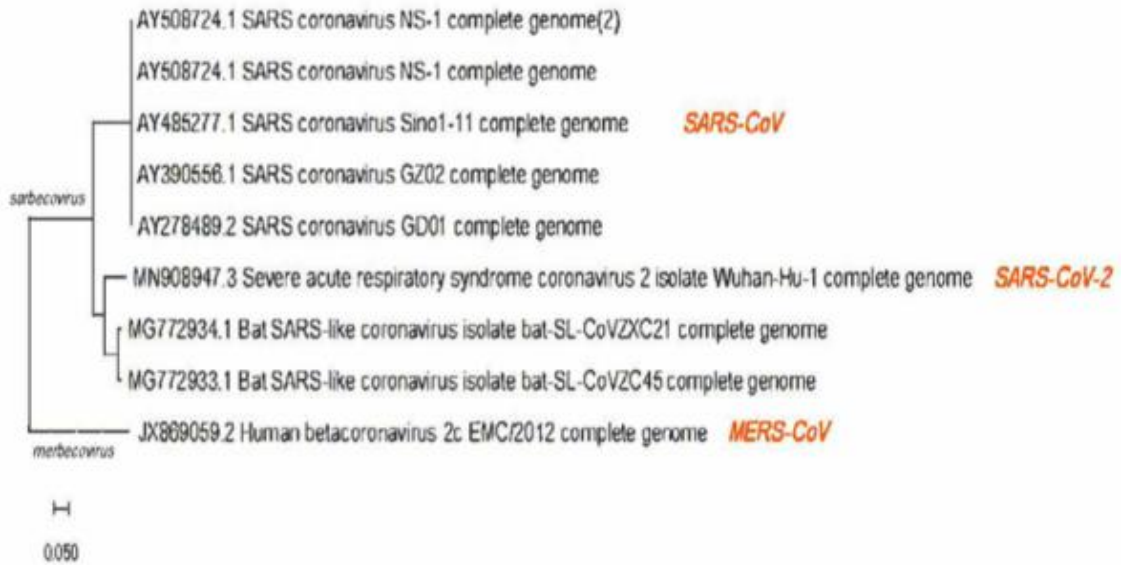


Figure 2. Phylogenetic analysis of SARS-CoV-2.

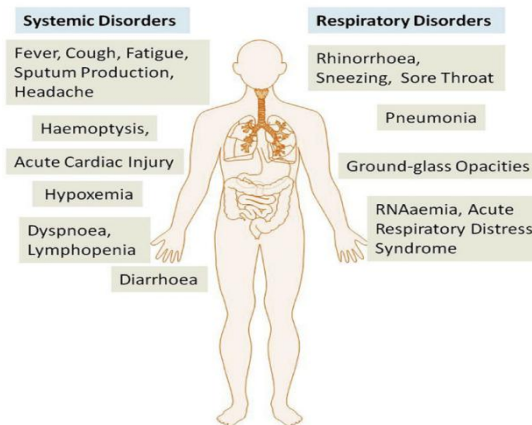


Figure 3. Overview of COVID-19 infection



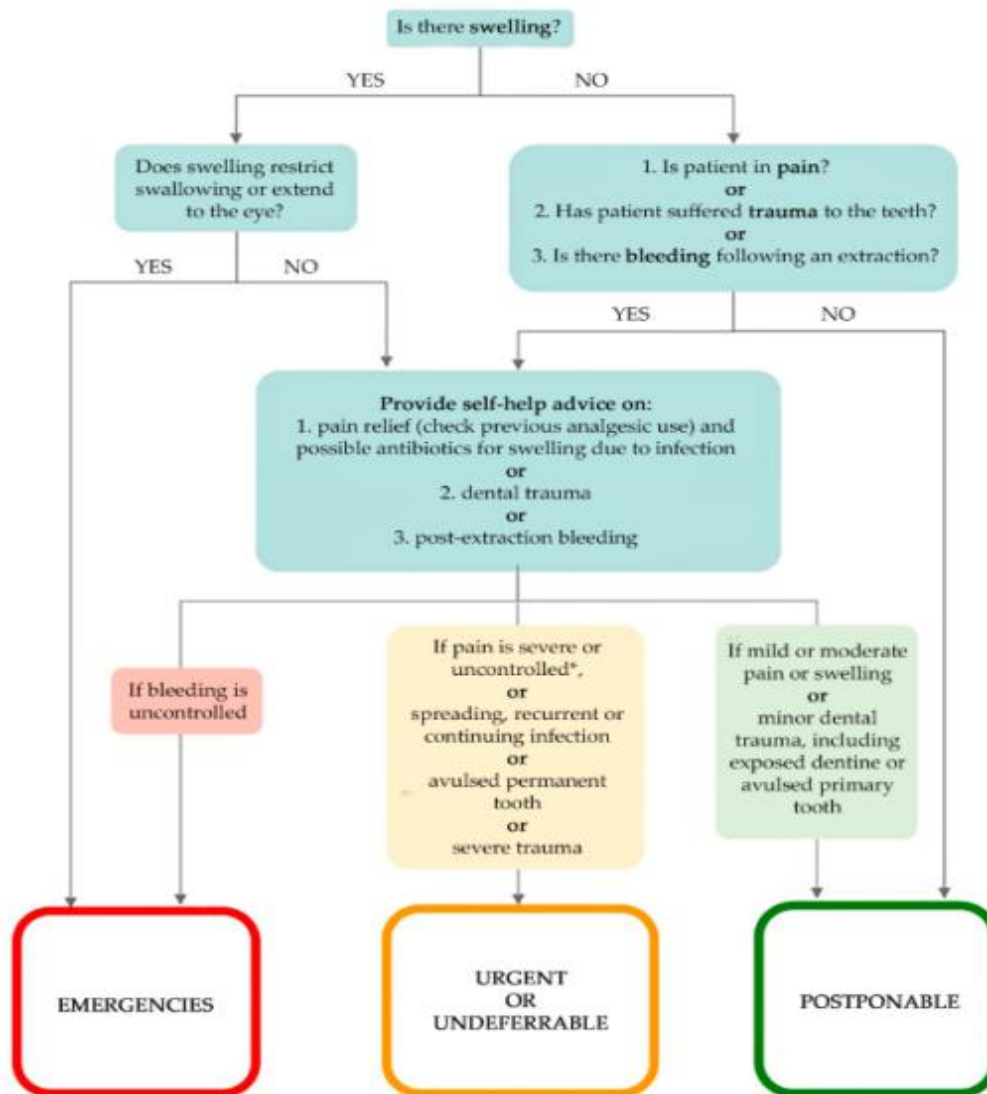


Figure 4. Dental triage during COVID-19 outbreak.