Dental clinics were suspected to be a hotspot for nosocomial transmission of coronavirus disease 19 (COVID-19), yet there has been no clear recommendation about emergency dental care and appropriate personal protective equipment during pandemics. In this paper, we aim to summarize recommendations for (i) patient risk assessment, (ii) patient triage, and (iii) measures to prevent infection of health professionals and nosocomial transmission in dental clinics. The available evidence was collected by performing searches on PubMed, Embase, and Cochrane databases. We reviewed papers on COVID-19, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), influenza, and related respiratory viral diseases. Legal and ethical frameworks, as well as international (e.g., World Health Organization (WHO)) and national (e.g., public health institutes, dental associations) guidelines were screened to summarize recommendations related to dental emergency care. To assess the patient risk, a questionnaire was developed to classify patients at unknown, high, and very high risk. Patient triage recommendations were summarized in a flow chart that graded the emergency level of treatments (i.e., urgent, as soon as possible, and postpone). Measures to prevent disease transmission based on current evidence were grouped for dental health professionals, dental clinics, and patients. The present recommendations may support health professionals implement preventative measures during the pandemic.

**Individual Risk Assessment**

We recommend that patients who had contact with COVID-19 positive patients or visited any high-risk region according to the WHO in the last 14 days should be classified as very high-risk patients.

We recommend that patients who had contact with COVID-19 positive patients or visited any high-risk region according to the WHO in the last 14 days, but do not show flu-like symptoms should be classified as very high-risk patients.

We recommend that patients who did not have contact with COVID-19+ patients or did not visit any high-risk region according to the WHO in the last 14 days but show flu-like symptoms should be classified as high-risk patients.

All other patients should be classified as having an unknown risk, i.e., being potentially contagious.

A questionnaire to evaluate risk assessment is provided in File S1. The outcomes of the questionnaire are recommended to be translated into the individual risks as follows:

- **Very high risk:** The patient scores at least 1 YES in epidemiological history AND/OR patient has been tested positive for COVID-19
- **High risk:** The patient scores at least 0 YES in epidemiological history and at least 1 in clinical manifestation
- **Unknown risk:** The patient scores 0 YES in epidemiological history and 0 YES in clinical manifestation

**Rationale of the Authors**

Due to the high number of asymptomatic patients and the contagiousness prior to and after the onset of clinical symptoms, the authors recommend that every patient has to be considered potentially contagious during the COVID-19 pandemic. However, particular precaution is advisable for patients with a very high likelihood of contagiousness.

**Patient Triage Recommendation**

We recommend classifying dental treatment needs as urgent (within the next 24 h), as soon as possible (ASAP) (within the next 7 days) and postpone (no urgency). The recommendations are summarized in Figure 1. For the patient triage, we divided the recommendations into general, as well as COVID-19 risk specific (see Section 4.1).
Prior to the visit, we recommend assessing individual patient risk and dental treatment needs at the telephone or through a video conference. To limit the number of potentially contagious people in the clinic, the patient should not report with accompanying people. Exceptions comprise disabled, children, or geriatric and hospitalized patients. Furthermore, aerosol free treatments should be selected (if possible). When radiographs are needed, extraoral radiographs should be preferred. Rubber dam may be used when applicable to limit virus transmission.

### Triage Recommendations

Patients exhibiting very high risk should generally not be seen at the clinic unless they have an urgent treatment need (video conference may be used to validate urgent treatment needs). Otherwise, antiseptics or antibiotics in combination with frequent telephone interviews may be used to postpone the treatment until recovery.

Questions to identify urgent treatment needs may include:

1. Do you have pain? Yes/No
2. If yes, where is the pain and from how long? Yes/No
3. Is the pain associated with swelling and limited opening of the mouth? Yes/No
4. Have you taken any medication, like paracetamol/ibuprofen/Aspirin? If yes, did you find any relief? Yes/No
5. Do you have any underlying medical conditions? If yes, which one:

### Rationale of the Authors

Based on legal and ethical frameworks, dental treatments have to be provided to all patients in demand or pain. During the COVID-19 pandemic, social distancing is mandatory to minimize the spread of the virus and there is a risk of nosocomial transmission at dental clinics. Therefore, we recommend avoiding dental treatments unless they cannot be postponed. However, concerns may arise regarding the unnecessary overprescribing of antibiotics from tele-dentistry, thus contributing to the development of antibiotic resistance.

### Measures to Prevent Infection in Dental Settings

We recommend the following measures to be adopted during COVID-19 pandemic. The measures are summarized in Figure 2.
Personal Protective Equipment for Dental Professionals

For patients exhibiting a (very) high COVID-19 risk, we recommend using N95/FFP2 or FFP3 masks with proper fit, face-shields, and regular gloves. Adjunctive use of caps, overshoes, and coats may further increase safety. The same measures are recommended to be used for patients exhibiting an unknown risk, whereas a regular surgical mask may be combined with a face-shield for aerosol-free treatments in scarcity of PPE.

Recommendations Regarding the Dental Clinic

Between consecutive patients, we recommend proper disinfection and sufficient room ventilation (time depends on the size of the room, the number and the size of the windows, the type of treatment). For room disinfection, ethyl-alcohol (78%) is considered to be the most effective. Disinfection should include all flat surfaces, computers, keyboard, mouse, lamps, and doorknobs.

Negative pressure isolation rooms may be considered to treat patients with COVID-19 or very high risk of disease to prevent virus-laden aerosols transmission. However, it has to be noted that isolation rooms are only effective when the airflow direction is well controlled by adequate pressure monitors and negative pressure control devices.

Recommendations to Be Followed by Patients

We recommend patients attending dental clinics must perform hand hygiene using alcohol-based hand rub or soap and water. Patients should store their belongings in a locker outside the clinic and wear overshoes (if available). They should be instructed to refrain from touching their mouth, nose, and eyes with dirty hands, and they should avoid shaking hands. If outdoor waiting is inevitable, patients are recommended to maintain at least a 1 m distance in the waiting areas. Prior to the treatment, we recommend rinsing with a mouth wash to reduce the virus load in saliva prior to beginning dental treatment. Hydrogen peroxide (1–1.5%) or povidone iodine (0.2%) were reported to be most effective.

Rationale of the authors

Due to the high risk of nosocomial transmission and as every person is potentially contagious, maximum prevention measures are required to prevent direct-contact transmission, but also indirect transmission of the virus.

Future Perspectives for Elective Dental Care
We recommend that patients, before visiting the dental office, have epidemiological and clinical screening. Ideally, patients and health professionals should also be tested for COVID-19 before dental treatment. Unless COVID-19 test of a patient has been negative, elective treatments should be performed following the infection control measures presented in above recommendations. Briefly, if the treatment includes aerosol generating procedures, the FFP2/FFP3 masks and other PPE should be used. If the treatment does not include aerosol, surgical mask with visor may be used unless there are other risks such as underlying medical conditions.

Keywords
covid-19;dentistry;hygiene;triage;nosocomial-transmission

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