Summary of European guidelines on infection control and prevention during COVID-19 pandemic

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Abstract

Objectives: The current COVID-19 pandemic highlighted the need for a review of guidelines on infection control and prevention to ensure safe delivery of dental care. However, it is not clear to what extent the rapidly published European guidelines reflect the current evidence and thus provide homogeneous recommendations.

Material & Methods: Guidelines from all European Union countries, Scotland, Switzerland and United Kingdom were retrieved. Information on triage, mouth rinse, personal protective equipment (PPE) for aerosol free/generating procedures (non-AGP/AGP) and treatment of potentially infectious patients were summarized and compared with recommendations from international organizations (WHO, ECDC, CDC).

Results: All included countries (30/30) published COVID-19 guidelines in 2020. All countries recommended triage and to postpone non-urgent treatment of potentially infectious patients. Hydrogen peroxide (1%–1.5%) was the most frequently recommended antiseptic mouth rinse to reduce viral load (24/30). PPE for non-AGP treatments included mainly surgical masks (21/30) or FFP2/FFP3/N95 masks (16/30), whereas FFP2/FFP3 masks (25/30) and face shields (24/30) were recommended for AGP by the vast majority of guidelines. For high-risk/COVID positive patients, most countries recommended maximum protection and treatment in specialized dental clinics (22/30).

Conclusion: There was general agreement among recommendations for triage, mouth rinse, and PPE during AGP and treatment of potentially infectious patients. In contrast, recommendations on PPE for non-AGP treatment varied considerably among the European countries possibly due to limited scientific evidence regarding transmission risk during non-AGP treatments.

Keywords
COVID-19 pandemic, guideline, infection control and prevention, personal protective equipment
1 | INTRODUCTION

In dentistry, infection control and prevention (ICP) have a long history reaching back to Ignaz Semmelweis, who significantly reduced deaths during childbirth by advising doctors to wash their hands before touching the women in labour in 1847 (Nield, 2020). Three decades thereafter, Robert Koch discovered and proved that airborne droplets can transmit tuberculosis (Lu & Zambito, 1981). Willoughby D. Miller reported on infectious properties of saliva as well as the relevance of mechanical instrument cleaning and disinfection in dentistry (Miller, 1890, 1891). At the same time, gloves were proposed to prevent infection from these diseases (Lathan, 2010). Nevertheless, most dentists did not appreciate the relevance of preventive measures until 1931, when it became evident that the incidence of tuberculosis in their profession was particularly high (Nield, 2020). In the late 1950s, research on aerosols, antiseptics, ventilation, rubber dam, disinfection and additional preventive measures gained in popularity. With the emergence of HIV/AIDS in the 1980s, autoclaves were introduced as a substitute for disinfection with boiling water as well as various other measures to decrease the risk of microbial transmission in Dental Unit Water Supplies (DUWS) (Nield, 2020). However, it took over one century from the discovery of preventive measures to the development of evidence-based recommendations for the protection of patients and dental professionals. In the 1990s, guidelines on ICP were published for the first time by, for example the British Dental Association (BDA) in 1991 (Bimbaum, 1991) and the German Commission on Hospital Hygiene and Infection Protection at the German Commission on Hospital Hygiene and Infection Protection at the Robert Koch Institute (1998). They covered standard infection prevention protocols on instrument cleaning, sterilization, personal protective equipment (PPE) and additional preventive measures. Nowadays, various European countries provide evidence-based recommendations on ICP (ECDC, 2020).

Since the outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic in 2020, dentists were considered to be among medical professionals at the highest infection risk, for the reasons being that the virus resides in the epithelium of the oral cavity, throat, nose and salivary ducts making saliva particularly infectious (Wyllie et al., 2020). Face masks are a highly effective preventive measure during SARS-CoV-2 pandemic, but not applicable in dental settings as patients cannot wear mask during treatments. Aerosol, blood and splatter may further increase transmission risk (Epstein et al., 2021; Izzetti et al., 2020). To protect both dental professionals and patients, refined COVID-19 guidelines or recommendations were rapidly published in various countries, and also by international organizations. However, due to the progress of the situation, it is not clear to what extent they cover the available evidence and thus provide homogenous recommendations. Nevertheless, for continuation of dental care, scientifically based recommendations are essential.

Therefore, the primary aim of this review was to collect, summarize and assess the homogeneity of the most recent versions of national guidelines from European countries for the management of dental care during COVID-19 pandemic issued by official authorities (e.g. Ministry of Health) or recognized dental associations.

The secondary aim was to compare the national guidelines with available scientific evidence and recommendations published by the European Centre for Disease Prevention and Control (ECDC), the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC), as the United States (US) is the country reporting the highest number of COVID-19 cases and deaths since the start of the pandemic.

2 | MATERIAL AND METHODS

The present study was conducted and reported according to the “Standards for reporting qualitative research: a synthesis of recommendations” (O’Brien et al., 2014).

The purpose of the present review was to summarize the most recent available European national recommendations and guidelines regarding dental care provision during COVID-19. Beside guidelines issued in the 27 member countries of the European Union (EU), in addition, relevant guidelines released in Switzerland, United Kingdom (UK) and Scotland were included. Also, for comparison, guidelines released by the ECDC, WHO and CDC were taken into consideration.

A manual search was carried out for national guidelines available on websites of European governments, national dental organizations and in a database of the World Dental Federation (FDI). Additionally, the administrative secretary of the European Chief Dental Officers was contacted and asked to forward the request to the respective national officers for access to the national guidelines. Eventually, selection of the guidelines was also based on word-of-mouth communication with an international network of colleagues from different countries in order to assist with the identification and translation of relevant documents.

No language restrictions were applied. The native languages of the members of this research group were German, Italian, Polish and Swedish, with good knowledge of English and Spanish. The team was able to translate guidelines published in Bulgarian, Croatian, French, Portuguese and Romanian with translations tools (DeepL Translator and Google Translator) being used when necessary. For other languages, the help of volunteer colleagues, recruited from the circle of acquaintances of the authors, was indispensable (Czech, Danish, Dutch, Estonian, Finnish, Greek, Hungarian, Latvian, Lithuanian, Slovakian, Slovenian). In the last cases, all the manuscripts were also double checked by the authors by means of translation tools. All guidelines were retrieved from the web between 23 December 2020 up to 15 January 2021. A data extraction form was developed a priori, and information was extracted by three reviewers (K.B., G.B., K.G.C.). The following data were registered: guideline-related information (country, organization releasing the guideline, title, URL at which the document was available for download, date of release, linked evidence), information regarding triage prior to the appointment or on arrival
at the dental clinic, measures applied by patients to reduce the risk of COVID-19 infection (i.e. PPE, social distance in waiting areas, temperature check, hand hygiene, presence of accompanying people, maximum waiting time and type, concentration and timing of mouth rinse) and air ventilation. Furthermore, type of treatments (i.e. urgent and elective) recommended for low-risk and high-risk/COVID-19 (COVID+) patients was also recorded. Low risk referred to patients presumed to be COVID-19 negative, while high risk/COVID+ were considered the patients with suspected or confirmed positive COVID-19 status or who had been in contact with COVID+ individuals.

Data items also included PPE for dental professionals recommended on the basis of risk assessment for the treatment of patients. Thus, the following PPE was searched: type of mask/respirator, eye protection (e.g. goggles, face shield), gloves, head protection (e.g. cap, cowl) and body protection (e.g. gown, apron), overshoes. For high-risk/COVID+ patients, no distinction on recommended PPE for either non-AGPs or AGPs was made, whereas for low-risk patients recommended PPE for non-AGPs and AGPs were listed separately. Finally, recommended locations and conditions for providing care to high-risk/COVID+ patients were noted.

If data were not found within the guidelines, they were not reported in the data summary. Therefore, their exclusion does not mean that missing measures were not recommended.

Tables and graphs were used to summarize the data. Only data from the 30 selected European countries are presented in the graphs.

3 | RESULTS

A total of 52 national European guidance documents from 30 countries, including 27 EU countries, Switzerland, Scotland and UK, were identified. As in Scotland some of the recommendations vary compared to UK, and therefore presented separately. Five additional guidelines released by ECDC, WHO and CDC were also included (see Supplementary File). In 38 out of 52 analysed national European guidance documents (and in three of five documents from ECDC, WHO, and CDC), reference lists of scientific evidence were included. None of the guidelines assessed the quality of the cited references. However, this evaluation did not fall into the scope of the present work. A detailed summary of each selected document is presented in Table 1 (O’Brien et al., 2014).

3.1 | Patient triage

In all EU countries as well as in Switzerland, Scotland and UK, remote triage (i.e. by telephone, email or other means of communication) prior to the appointment is recommended. This is in agreement with ECDC and WHO guidelines. Similarly, in US, the patients should be triaged on phone before visiting a dental office or clinic as recommended in the CDC guidelines.

Once the patient arrives at the clinic, the triage is considered fundamental in particular when it has not been performed in advance remotely (ECDC, WHO, CDC). In 23 out of 30 selected European countries, triage at the dental clinic has been recommended, whereas no specific information regarding a reassessment at the arrival has been reported in the guidelines of the remaining countries (Austria, Belgium, France, Latvia, Portugal, Sweden and Switzerland).

3.2 | Measures applied by patients to reduce the risk of COVID-19 infection

Patient-related measures to minimize the risk of COVID-19 infection and transmission in dental settings include the use of PPE, social distancing, limitation of the time and people in the waiting areas, temperature check, hand hygiene and preoperative mouthwash.

3.2.1 | PPE to be worn by patients

In accordance with WHO, ECDC and CDC, in areas with high community transmission of COVID-19, patients should be encouraged to wear a mask, regardless of the individual risk assessment. In all the included European national guidelines but one (i.e., Bulgaria), mask has been recommended. Some countries listed additional PPE when treating patients attending a dental clinic, including face shield or full-face visor (Denmark, Malta), gloves (Finland, Lithuania) and overshoes (Lithuania).

3.2.2 | Waiting areas

Maintaining a social distancing of at least 1 to 2 metres has been recommended in the guidelines of 29 out of 30 European countries, while no information regarding social distancing in the waiting areas has been reported in Czech guidelines. Indeed, according to the latter, patients should be invited to wait outside and to enter after a call or text message at the very last moment before their appointment. A 1-metre distance is recommended in the ECDC, WHO and CDC guidelines.

Concerning body temperature measurement, it has been recommended in the national guidelines of 13 European countries (Bulgaria, Croatia, Cyprus, Estonia, Hungary, Italy, Latvia, Malta, Netherlands, Poland, Romania, Slovakia, Switzerland). Temperature check on arrival is specifically not recommended in the French and Irish guidelines. However, in the remaining guidelines, including the ECDC, WHO and CDC ones, this measure is not reported.

The WHO reported the importance of hand hygiene performed by the patients, and it was also recommended in the majority of the European countries (24/30), as well as in the ECDC and CDC guidelines. In the guidance documents of 6 countries, it is not reported that patient visiting the dental office or clinic is required to perform
| Country | Organization | Date of Release | Phone | Clinic | PPE | Waiting area | Mouth rinses | Air ventilation |
|---------|--------------|-----------------|-------|--------|-----|--------------|---------------|----------------|
| Austria | Austrian Dental Association | 30 September 2020 | Yes   | Yes    | Mask | Social distancing (1 m) | H$_2$O$_2$ 1% | Regular ventilation |
| Belgium | Epidemiology of Infectious Diseases Service, Sciensano | 3 November 2020 | Yes   | Not reported | Mask | Social distancing (1.5 m) | H$_2$O$_2$ 1% Povidone-iodine 1% | More than 2.5 air changes/h |
| Bulgaria | Bulgarian Dental Association | 3 June 2020 | Yes   | Yes    | Not reported | Social distancing (2 m) | CHX not recommended (inefficient) | Air ventilation between patients |
| Croatia | Croatian Chamber of Dental Medicine | May 2020 | Yes   | Yes    | Surgical mask | Social distancing (2 m) | H$_2$O$_2$ 1% (15 s gargling and 30 s rinsing) Povidone-iodine (gargling and 30 s rinsing) | Natural ventilation (windows, after every patient and beginning / end of the day). Mechanical ventilation (recommended but not specified). |
| Date of Release | Organization | Country
|-----------------|---------------|-----------------|
| 3 May 2020      | Croatian Dental Medicine Association | Croatia
| 3 June 2020     | Bulgarian Dental Association | Bulgaria
| 3 November 2020 | Epidemiology of Belgium High Health Council Service, Sciensano Infectious Diseases Association | Belgium
| 30 September 2020 | Austrian Agency for Health and Food Safety | Austria

### TABLE 1

#### Summary of guidelines of 30 European countries, US, ECDC and WHO on infection prevention and control (IPC) measures to May 2020

| Patient measures | Treatment Low-risk | Treatment High-risk/COVID+ |
|------------------|--------------------|----------------------------|
| **Type of treatment** | **PPE** | **AGP** | **PPE** | **AGP** | **Location & conditions** |
| Urgent and elective | Surgical masks | Standard PPE | Surgical masks | Eye protection (protective shield) | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 or FFP3; surgical mask minimum protection |
|                   | FFP if patient cannot wear mask (in case of shortage surgical mask plus face shield) | Eye protection (goggles or preferably face shield) | FFP2 or FFP3; surgical mask minimum protection | Eye protection (goggles or preferably face shield) | FFP2 or FFP3; surgical mask minimum protection |
|                   | Headwear (surgical cap) | Gloves | Headwear (apron) | Gloves | Headwear (apron) |
|                   | Respiratory masks not absolutely necessary | Mouth rinses | Body protection (apron) | Body protection (apron) | Body protection (apron) |
|                   | Phone | Clinic | Triage | Mouth rinses | Air ventilation |
|                   | Not specified | - Disinfection barrier | - Max waiting time | - Not accompanied | - Hand hygiene |
|                   | Yes | - Temperature check | - Hand hygiene | - Temperature check | - Temperature check |
|                   | Yes | - Mask | - Temperature check | - Mask | - Temperature check |
| Urgent and elective, but urgent has priority | FFP2 if patient cannot wear mask | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 or FFP3; surgical mask minimum protection |
|                   | - FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | Eye protection | Eye protection (goggles or preferably face shield) | Eye protection (goggles or preferably face shield) | Eye protection (goggles or preferably face shield) |
|                   | - Headwear | Gloves | Gloves | Gloves | Gloves |
|                   | - Body protection (apron) | Body protection (apron) | Body protection (apron) | Body protection (apron) | Body protection (apron) |
|                   | - Overshoes (if necessary) | Overshoes (if necessary) | Overshoes (if necessary) | Overshoes (if necessary) | Overshoes (if necessary) |
| Urgent and elective, but urgent has priority | FFP2 if patient cannot wear mask | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) |
|                   | - FFP2 if patient cannot wear mask (in case of shortage surgical mask plus face shield) | Eye protection (goggles or preferably face shield) | Eye protection (goggles or preferably face shield) | Eye protection (goggles or preferably face shield) | Eye protection (goggles or preferably face shield) |
|                   | - Headwear | Gloves | Gloves | Gloves | Gloves |
|                   | - Body protection (apron) | Body protection (apron) | Body protection (apron) | Body protection (apron) | Body protection (apron) |
|                   | - Overshoes (if necessary) | Overshoes (if necessary) | Overshoes (if necessary) | Overshoes (if necessary) | Overshoes (if necessary) |
| Urgent and elective | Surgical mask | Eye protection (face shield) | Surgical mask | Eye protection (face shield) | Eye protection (face shield) |
|                   | Eye protection (face shield) | FFP2 | FFP2 | FFP2 or FFP3 |
|                   | Gloves | Eye protection (goggles and face shield) | Gloves | FFP2 or FFP3; surgical mask minimum protection |
|                   | Headwear | Double gloves | Headwear (disposable cap) | FFP2 or FFP3; surgical mask minimum protection |
|                   | Disposable surgical gown | Body protection (disposable surgical gown) | Body protection (disposable surgical gown) | Body protection (disposable surgical gown) |

(Continues)
| Country                  | Organization                                      | Date of Release  | Triage | Patient measures                                                                                     |
|-------------------------|---------------------------------------------------|------------------|--------|------------------------------------------------------------------------------------------------------|
| Cyprus                  | Ministry of Health                                | 2 May 2020       | Yes    | Surgical mask                                                                                       |
|                         | Pancyprian Dentist Association                    | 3 May 2020       | Yes    | - Social distancing (2 m)                                                                          |
|                         |                                                   |                  |        | - Temperature check                                                                                |
|                         |                                                   |                  |        | - Hand hygiene                                                                                    |
|                         |                                                   |                  |        | - Not accompanied                                                                                  |
|                         |                                                   |                  |        | - Enter clinic after phone call                                                                    |
|                         |                                                   |                  |        | - If multiple patients, isolated waiting rooms recommended and disinfected between visits           |
| Czech Republic          | Czech Dental Chamber                              | 20 April 2020    | Yes    | Surgical mask                                                                                       |
|                         |                                                   |                  |        | - Patients have to wait outside                                                                    |
|                         |                                                   |                  |        | - Information by call/text message when they can enter                                             |
| Denmark                 | Statens Serum Institute                           | 10 Mar 2020      | Yes    | Surgical mask and face shield (while high infection risk)                                            |
|                         | The National Board of Health                      | 6 January 2021   | Yes    | - Social distancing (1 m, 2 m for high-risk patients)                                                |
|                         |                                                   |                  |        | - Hand hygiene                                                                                    |
|                         |                                                   |                  |        | - Not accompanied (exceptions)                                                                    |
| Estonia                 | Estonian Health Board                             | 11 April 2020    | Yes    | Surgical mask                                                                                       |
|                         | Estonian Dental Association                       | 30 April 2020    | Yes    | - Social distancing (2 m)                                                                          |
|                         |                                                   |                  |        | - Temperature check                                                                                |
|                         |                                                   |                  |        | - Hand hygiene                                                                                    |
|                         |                                                   |                  |        | - Not accompanied                                                                                  |
| Finland                 | National Institute for Health and Welfare (THL)   | 13 October 2020  | Yes    | According to respective recommendations of the region, currently masks and gloves                  |
|                         |                                                   |                  |        | - Social distancing (2 m)                                                                          |
|                         |                                                   |                  |        | - Hand hygiene                                                                                    |
|                         |                                                   |                  |        | - Not accompanied                                                                                  |
|                         |                                                   |                  |        | - Tooth brushing                                                                                  |

**Note:** For high-risk patients (COVID−19), 
H₂O₂ 1%-1.5% (60 s) Betadine iodine (10 mg/ml) (60 s) 
Good ventilation recommended.
| Treatment Low-risk | Treatment High-risk/COVID+ |
|--------------------|---------------------------|
|                    | PPE | AGP | Type of treatment | PPE | AGP | Location & conditions |
| Urgent and elective| Surgical mask | At least FFP2 | Urgent only | FFP3 | - eye protection (goggles and face shield) | Hospital in negative pressure room |
|                    | Eye protection (goggles and face shield) | Eye protection (goggles and face shield) | (if possible, postpone for 14 days, advise RT-PCR test before next appointment) | - eye protection (goggles and face shield) | Dental clinic |
|                    | Gloves | Gloves | Surgical mask | Gloves | - Headwear (cap) | |
|                    | Headwear (cap) | Headwear (cap) | Eye protection (goggles and face shield) | Headwear (cap) | - Body protection (surgical gown) | |
|                    | Body protection (waterproof gown) | Body protection (waterproof gown) | Body protection (waterproof gown) | Body protection (waterproof gown) | |
| Urgent and elective| FFP2 | FFP2 | Urgent only | FFP2/FFP3 | - Eye protection (goggles and/or face shield) | Hospital, dental emergency |
|                    | Eye protection (visor) | Eye protection (visor) | Surgical mask | Gloves | - Body protection (surgical gown) | |
|                    | Gloves | Gloves | Eye protection (goggles and/or face shield) | Headwear (cap) | - Body protection (surgical gown) | |
|                    | Headwear (cap) | Headwear (cap) | Body protection (gown) | Body protection (gown) | |
|                    | Surgical mask | Surgical mask | RT-PCR test required before performing the procedure | RT-PCR test required before next appointment | |
|                    | Eye protection (goggles and face shield) | Eye protection (goggles and face shield) | Surgical mask | Surgical mask | |
|                    | Gloves | Gloves | Eye protection (goggles and face shield) | Headwear (cap) | |
|                    | Headwear (cap) | Headwear (cap) | Body protection (gown) | Body protection (gown) | |
|                    | Body protection (gown or apron) | Body protection (gown or apron) | Body protection (gown with/without sleeves) | Body protection (gown with/without sleeves) | |
| Urgent and elective| Surgical mask | FFP2/FFP3 | Urgent only | FFP2/FFP3 | - Eye protection (goggles and face shield) | Tallinn North Estonian Regional Hospital in negative pressure room |
|                    | Eye protection (goggles) | Eye protection (goggles) | Surgical mask | Gloves | - Headwear (cap): optional | Dental clinic in Tartu and Tartu University Facilities—not reported |
|                    | Body protection (apron) | Body protection (apron) | Eye protection (goggles and face shield) | Headwear (cap) | |
|                    | FFP2/FFP3 | FFP2/FFP3 | - Body protection (gown) | Gloves | |
|                    | RT-PCR test required 48 hr before | RT-PCR test required 48 hr before | Body protection (gown) | Headwear (cap) | |
| Elective and urgent| FFP2 or FFP3 | FFP2 or FFP3 | Urgent only | FFP2/FFP3 (if they have a valve, additional surgical mask), | Not specified, all dentists |
|                    | Eye protection (face shield) | Eye protection (face shield) | Eye protection (face shield) | Eye protection (face shield) | |
|                    | FFP2 or FFP3 (long-sleeved disposable liquid-impervious jacket) | FFP2 or FFP3 (long-sleeved disposable liquid-impervious jacket) | FFP2 or FFP3 (long-sleeved disposable liquid-impervious jacket) | |

(Continuous)
| Country       | Organization                                                                 | Date of Release | Phone | Clinic          | Triage | Patient measures                                                                                           | Waiting area                                                                 | Mouth rinses                                      | Air ventilation                                      |
|--------------|------------------------------------------------------------------------------|-----------------|-------|-----------------|--------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| France       | French National Authority for Health                                         | 14 May 2020     | Yes   | Not reported    | General public mask or surgical mask. Surgical mask always for patients who risk to develop a severe form of the disease, high-risk patients and COVID+ | - Social distancing (1 m) - Forehead temperature check not recommended - Hand hygiene - Not accompanied (exceptions: minors and non-autonomous patients) | H₂O₂, Povidone iodide                                                                 | Treatment room with window: maintain a minimum permanent ventilation without generating an air current. Ventilation for at least 15 min after AGP. Windowless treatment room: no AGP. Consider air handling unit (AHU). Air conditioning: no consensus among experts. Air purifiers: no consensus among experts. |
| Germany      | German group for hygiene in dentistry (DAHZ)                                | 20 April 2020   | Yes   | Yes             | Mask   | Social distancing (1.5 m)                                                                                     | 30–60 s (for all mouth rinses): Octenidine ≤0.1% H₂O₂ 1%–1.5% CHX 0.2% CPC 0.2% Sodium hypochlorite ≤0.25% Dequalinium chloride/ benzalkonium chloride Listerine® cool mint For high-risk patients: octenidine, povidone iodide or H₂O₂ | Natural air ventilation recommended.                                                                 |                                                                                                                                              |
| Greece       | Helenic Dental Federation                                                     | 3 November 2020  | Yes   | Yes             | Surgical mask - Social distancing (1.5–2 m) - 1 patient/h - Not accompanied                                   | H₂O₂ 1% (30 s) CHX not recommended                                                                                      | The practice must be well ventilated but the use of “climate control apparatus” is not considered safe unless it is used 24/7 and in accordance with the regulations of the Ministry of Health. |                                                                                                                                              |
### Treatment Low-risk

| Type of treatment | PPE non-AGP | AGP | Treatment Low-risk |
|-------------------|-------------|-----|--------------------|
| Urgent and elective. Urgent treatment priority. | Surgical mask | Eye protection (goggles or face shield) | Disposable gloves | Headwear (cap) | Overshoes: their use is not justified |
|                   | Non-staining AGP (rubber dam): | FFP2 | Eye protection (goggles or face shield) | Disposable gloves | Body protection (plastic apron) | Headwear (cap) |
|                   | Surgical mask; FFP2/FFP3 (if patient cannot wear mask) for employees | Eye protection (goggles with lateral protection) | Disposable gloves | Headwear (cap) | Body protection (gown) |
|                   | Surgical mask | Eye protection (goggles with lateral protection) | Disposable gloves | Headwear (cap) | Overshoes: their use is not justified |

### Treatment High-risk/COVID+

| Type of treatment | PPE non-AGP | AGP | Location & conditions |
|-------------------|-------------|-----|-----------------------|
| Urgent only       | FFP2/FFP3 | Eye protection (face shield, goggle with lateral protection) | University clinic, specialized practice prioritized, every dentist can treat COVID–19 patients. |
|                   | Gloves | Body protection (gown) | University clinic, specialized practice prioritized, every dentist can treat COVID–19 patients. |
|                   | If possible: | Headwear (cap) | University clinic, specialized practice prioritized, every dentist can treat COVID–19 patients. |
|                   | Overshoes | | University clinic, specialized practice prioritized, every dentist can treat COVID–19 patients. |

(Continuous)
| Country | Organization | Date of Release | Triage | Patient measures | Waiting area | Mouth rinses | Air ventilation |
|---------|--------------|-----------------|--------|------------------|--------------|--------------|----------------|
| Hungary | Ministry of Human Resources | 4 May 2020 | Yes | Yes | Mask | - Social distancing (2 m) | \(\text{H}_2\text{O}_2\) 1% (60 s) | Continuous ventilation/air cleaning is recommended. Natural ventilation: 15 min between patients. Air conditioning not recommended. |
| Ireland | Ireland’s Health Services (HSE) Health Protection Surveillance Centre | 9 October 2020 | Yes | Yes | Surgical mask | - Social distancing (2 m) | Not recommended | At all times it is appropriate to maximize ventilation insofar as practical given the facility and climate conditions. If AGP on low-risk COVID patient ventilation is not recommended |
| Italy | Committee of representatives from dental associations coordinated by the Ministry of Health | 30 May 2020 | Yes | Yes | Mask | - Social distancing (1 m) | 1st mouth wash: \(\text{H}_2\text{O}_2\) 1% (30 s) or Povidone iodide 0.2% (30 s) or CPC 0.05%–0.1% (60 s) 2nd mouth wash: CHX 0.2%–0.3% (60 s) | Natural ventilation: 10–15 min (open windows). Mechanical ventilation: air exchange 39.6 m³/h per person. Air conditioning: importance of filter maintenance. |
| Latvia | Latvian Dental Association / French Dental Association | 25 August 2020 12 March 2020 | Yes | Not reported | Mask | - Social distancing (2 m) | CHX 0.2% (20 s) plus \(\text{H}_2\text{O}_2\) 1% (20 s) | Natural air ventilation: 15 min after every patient. |
| Type of treatment | PPE non-AGP | AGP | Treatment Low-risk |
|-------------------|-------------|-----|------------------|
| Surgical mask or FFP2 based on risk assessment | FFP3, FFP3s with valves should be shielded with full-face visors, eye protection (goggles or face shield), gloves, headwear (cap), body protection (long-sleeved protective clothing; plastic apron), overshoes: not required | FFP2 or FFP3, FFP2 or FFP3 | Urgent only, minimize AGP |
| Urgent and elective | FFP2 / surgical mask II2, eye protection (goggles and face shield), gloves, headwear (cap), body protection (disposable waterproof gown), overshoes, disposable sleeves (optional) | FFP2, eye protection (goggles and face shield), gloves, headwear (cap), body protection (disposable waterproof gown), overshoes, disposable sleeves (optional), for patients: eye protection (goggles), headwear (disposable cap), overshoes | Not specified (minimize AGP), follow UK guidelines |
| Urgent and elective (patient requires negative RT-PCR COVID test at least 48 hr before treatment) | Blue group according to guidelines [1](http://www.lza-zobi.lv/uploads/files/covid19_praktiskais_celvedis25aug2020.pdf), surgical mask, face shield | Orange and red group | Urgent only |
| | | FFP2/FFP3, FFP2/FFP3, face shield, headwear (cap), body protection (waterproof apron) | FFP2/FFP3, eye protection (face shield), headwear (cap), body protection (surgical gown), overshoes | Only 1 clinic is permitted: Paula Stradina Klinikas Universts |
| Country Organization | Date of Release | Triage | Phone | Clinic | PPE | Waiting area | Mouth rinses | Air ventilation |
|----------------------|----------------|--------|-------|--------|-----|--------------|--------------|----------------|
| Lithuania Ministry of Health | 12 December 2020 | Yes | Yes | | Mask, gloves, overshoes | - Social distancing (2 m) | CHX plus H₂O₂ 1% | Natural air ventilation: 15 min (open windows), can be omitted in presence of EN1822-U15 filter. |
| Luxemburg | 28 April 2020 | Yes | Yes | | Mask | Social distancing (2 m) | H₂O₂ 1% | Natural air ventilation: 15 min. It can be omitted in presence of EN1822-U15 filter. |
| Malta Ministry for Health | June 2020 | Yes | Yes | | Facemask or cloth face covering or visor | - Social distancing (2 m) | For AGP. H₂O₂ 1% Povidone iodide 0.2% | Natural ventilation: 20 min (open windows). Usually, 15 min with air purification method. If no windows and no air purification method: 30 min after AGP. |
| Netherlands | 29 June 2020 Committee Guideline Oral Care Corona | Yes link to triage: https://www.knmt.nl/sites/default/files/flowchartriage-corona-a-mondzorg-versie61-17122020.pdf | Yes (not reported whether on phone or in practice) | | Wearing mask by patients is allowed—low risk; surgical mask type I/II/IIR | - Social distancing (1.5 m) | Only for high risk H₂O₂ 1% (60 s) | Natural ventilation—windows open after each treatment. Air conditioning—only with HEPA filter. Mechanical ventilation—preferably by negative pressure (high risk). |
| Location & conditions | Type of treatment | PPE | Treatment Low-risk | Treatment High-risk/COVID+ |
|-----------------------|-------------------|-----|-------------------|---------------------------|
|                      | Urgent and elective | non-AGP | - FFP2 or medical mask  
- Eye protection (face shield)  
- Headwear (disposable surgical cap)  
- Body protection (disposable waterproof coverall) | - FFP2 or FFP3 or equivalent (KN/N95)  
- Eye protection (goggles or face shield)  
- Disposable gloves  
- Headwear (cap)  
- Body protection (disposable plastic apron)  
- Disinfectable footwear/overshoes | - FFP2 or FFP3 or equivalent (KN/N95)  
- Eye protection (goggles with lateral protection)  
- Gloves  
- Headwear (cap)  
- Body protection (gown) | University hospital  
Referral to advanced care centres. Propose to postpone or teledentistry. |
| Country                        | Organization                        | Date of Release | Phone | Clinic | Triage                  | Patient measures                                      | Waiting area                                      | Mouth rinses                                      | Air ventilation                             |
|-------------------------------|-------------------------------------|-----------------|-------|--------|-------------------------|-------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------|
| Poland                        | Polish Dental Association           | 20 March 2020   | Yes   | Yes    | Surgical mask—obligatory in public | - Social distancing (1–1.5 m)                          | H₂O₂ 1% (60 s) CHX 0.2% (60 s)                  | Natural ventilation                             | Mechanical ventilation: 6 exchange per hr.  Biosanitizer with 6% plasma peroxide (15 min). |
|                               | Ministry of Health                  | 24 March 2020   |       |        |                          | - Temperature check                                    |                                                   |                                                   |                                             |
|                               | National Health System              | 27 March 2020   |       |        |                          | - Hand hygiene                                         |                                                   |                                                   |                                             |
|                               |                                     |                 |       |        |                          | - Not accompanied                                      |                                                   |                                                   |                                             |
|                               |                                     |                 |       |        |                          | (exception: children)                                   |                                                   |                                                   |                                             |
|                               |                                     |                 |       |        |                          | - 1 patient/h                                          |                                                   |                                                   |                                             |
| Portugal                      | Directorate-General of Health       | 1 May 2020      | Yes   | Not    | Mask                     | - Social distancing (2 m)                               | H₂O₂ 1% (30 s) Povidone iodide 0.2% (30 s)         | Promote air renewal, preferably by opening the window, If air conditioning is used, not in recycle mode. |
|                               |                                     |                 | reported| reported|                         | - Hand hygiene                                         |                                                   |                                                   |                                             |
|                               |                                     |                 |       |        |                          | - Not accompanied                                      |                                                   |                                                   |                                             |
|                               |                                     |                 |       |        |                          | (exceptions: only if necessary)                        |                                                   |                                                   |                                             |
| Romania                       | College of Dentists in Romania      | 25 May 2020     | Yes   | Yes    | Mask                     | - Social distancing (1.5–2 m)                           | H₂O₂ 1% or 1.5% (30 s) Povidone-iodine 0.2% - 10% (30 s) Before and after treatments | Dental interventions only in rooms with automatic ventilation or natural ventilation (window). Very good ventilation / ventilation of the dental office (open door / window) for at least 15 min after each patient. |
| Treatment          | Low-risk | High-risk/COVID+ |
|--------------------|----------|------------------|
|                     | PPE      |                 |
|                     | non-AGP  | AGP             |
| Urgent              | - Surgical mask/FFP2 | - FFP3 |
|                    | - Eye protection (face shield and goggles) | - Eye protection (goggles and face shield) |
|                    | - Gloves | | - Double gloves |
|                    | - Headwear (cap) | - Headwear (cap) |
|                    | - Body protection (gown) | - Body protection (gown) |
|                    | - Overshoes | - Overshoes |
| Urgent and elective | - FFP2 (N95) | - FFP2 (N95) or FFP3 |
|                    | - Eye protection (goggles and/or face shield) | - Eye protection (goggles and/or face shield) |
|                    | - Non-sterile disposables gloves | - Double gloves |
|                    | - Headwear (cap) | - Headwear (cap) |
|                    | - Body protection (disposable apron) | - Body protection (gown with rear opening, disposable, waterproof / fluid resistant, long sleeve, below the knee) |
|                    | - Clinical footwear | - Clinical footwear (otherwise overshoes) |
|                    |               | - Full protection coverall (optional to the gown) |
| Not specified.     | Not reported. | Not specified |
| Treatment priorities be considered. | Not reported. | Not specified |

- Surgical mask or KN95 / FFP2 (non-AGP in suspected COVID-19 patients); KN95, FFP2/FFP3 (AGP in suspected COVID-19 patients and always in COVID+) |
- Eye protection (goggles and/or face shield) |
- Disposable non-sterile gloves |
- Headwear (disposable waterproof cap) |
- Body protection (non-sterile waterproof long-sleeved surgical gown + disposable protective boots, or disposable waterproof coverall)
| Country                | Organization                                                                 | Date of Release          | Triage | Patient measures | PPE       | Waiting area                              | Mouth rinses | Air ventilation                      |
|-----------------------|------------------------------------------------------------------------------|--------------------------|--------|------------------|-----------|-------------------------------------------|--------------|--------------------------------------|
| Scotland              | Scottish Dental Clinical Effectiveness Program (SDCEP)                       | 12 June 2020, 25 September 2020 | Yes    | Yes              | Surgical mask | - Social distancing (2 m)                  | Not recommended | Natural ventilation 15 min, Air conditioning - not recommended |
|                      |                                                                               |                          |        |                  |           | - Hand hygiene                            |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Not accompanied (exceptions: child, vulnerable) |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Phone                                   |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Clinic                                  |              |                                      |
|                      |                                                                               |                          |        |                  |           | - PPE                                     |              |                                      |
| Slovakia              | Ministry of Health                                                           | 26 October 2020          | Yes    | Yes              | Surgical mask | - Social distancing (2 m)                  | H₂O₂ 1%       | Not specified                       |
|                      |                                                                               |                          |        |                  |           | - Temperature check                       |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Hand hygiene                            |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Not accompanied (exceptions)            |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Max one person in waiting area          |              |                                      |
| Slovenia              | Dental Chamber of Slovenia                                                   | 25 March 2020            | Yes    | Yes              | Surgical mask | - Social distancing (2 m)                  | Not recommended | Natural ventilation—open windows while working or for 10 min after each patient |
|                      |                                                                               |                          |        |                  |           | - Hand hygiene                            |              |                                      |
|                      |                                                                               |                          |        |                  |           | - Not accompanied (exceptions)            |              |                                      |
| Spain                 | General Council of Dentists of Spain                                         | 13 April 2020, 27 June 2020 | Yes    | Yes              | Mask      | - Social distancing (1.5 m)                | H₂O₂ 1% (30 s) | Ensure adequate ventilation (5–10 min after each patient) |
|                      | Ministry of Health, Ministry of Labour and Social Economy, National Institute for Safety and Health at Work (INSSIT), General Council of Dentists of Spain |                          |        |                  |           | - Hand hygiene                            | Povidone iodide 0.2% (30 s) |                                      |
|                      |                                                                               |                          |        |                  |           | - Not accompanied (exceptions: minors, or in case of addiction, disability etc.) | CPC (30 s) |                                      |
|                      |                                                                               |                          |        |                  |           |                                           | CHX not recommended |                                      |
| Treatment | Low-risk | High-risk/COVID+ |
|-----------|----------|-----------------|
| **Type of treatment** | **PPE** | **Location & conditions** | **PPE** | **Location & conditions** |
| Urgent and elective | | | | |
| | Surgical mask (FRSM type II) | Following UK guidance | FFP3 | UCCD (urgent dental care centres) Primary care not expected to provide urgent care for COVID+ |
| | Eye protection (goggles or face shield) | | Eye protection (goggles or face shield) | |
| | Gloves | | gloves | |
| | Headwear (cap) | | Headwear (cap): not recommended following UK guidelines | |
| | Body protection (single use apron, gown required if risk of splashing/spraying) | | single use gown | |
| | | | overshoes: not recommended following UK guidelines | |
| Urgent and elective (avoid AGP) | FFP2/FFP2 with valve, needs to be covered by surgical mask | Regional specialized clinics: high risk or hospital (red zone): COVID+ | FFP3/FFP3 with valve, needs to be covered by surgical mask | |
| | Eye protection (goggles and/or face shield) | | Eye protection (goggles and/or face shield) | |
| | Gloves | | Gloves | |
| | Headwear (cap) | | Headwear (cap) | |
| | Body protection (full-body gown or uniform) | | Body protection (full-body gown or uniform | |
| Urgent and elective | Surgical mask/ FFP2 | Ljubljana Health Centre | FFP2 | Ljubljana Health Centre, Maribor Health Centre, Celje Health Centre |
| | Eye protection (goggles or face shield) | | Eye protection (goggles and face shield) | |
| | Gloves | | Gloves | |
| | Headwear (cap) | | Headwear (cap) | |
| | Body protection (gown) | | Body protection (gown) | |
| Urgent and elective. Priority urgent cases. | FFP2 | Urgent only | FFP2/FFP3 | Not specified |
| | Eye and face protection | | Eye protection (goggles and face shield) | |
| | Gloves | | Gloves | |
| | Clogs and overshoes | | Headwear (waterproof disposable cap) | |
| | | | Body protection (waterproof disposable gown) | |
| | | | Clogs and overshoes | |
| Urgent only | FFP2 or FFP3 | Not specified | Not specified | |
| | Eye and face protection | | | |
| | Double gloves | | | |
| | Headwear | | | |
| | (waterproof disposable cap) | | | |
| | Body protection | | | |
| | (waterproof disposable gown) | | | |
| | Clogs and overshoes | | | |
| Country                | Organization                                          | Date of Release          | Triage | Patient measures                                                                 | Waiting area                                | Mouth rinses                        | Air ventilation                                                                 |
|-----------------------|-------------------------------------------------------|--------------------------|--------|----------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------|
| Sweden                | Swedish Work Environment Authority                    | 16 April 2020            | Yes    | Masks (private practices/ dental clinics are free to decide if they adhere to the rules) | Social distancing (1.5 m)                  | For high-risk patients: H₂O₂ 1% (30 s) | Secure ventilation and good air exchange at the whole clinic. Patient appointments should allow for reasonable halt between patients. |
|                       | Swedish National Board of Health and Welfare          | 09 June 2020             | Not    | reported                                                                         | Limit amount of people                     |                                     |                                                                                  |
|                       | Public Health Agency of Sweden                         | 23 December 2020         |        |                                                                                  | Not accompanied (except for children)      |                                     |                                                                                  |
| Switzerland           | Swiss Dental Association (SSO), Association of Cantonal Dentists in Switzerland (VKSZ) | 23 September 2020        | Yes    | Yes (it is recommended to avoid patients waiting for treatment inside the practice) | Social distancing (1.5 m)                  | H₂O₂ 1.5% (30 s) Povidone-iodine (30 s) | For AGP: complete air exchange <15 min, no treatment in rooms without option for ventilation or air filtration permitted |
|                       |                                                      |                          | Not    | reported                                                                         | Temperature check                          |                                     |                                                                                  |
|                       |                                                      |                          |        |                                                                                  | Not accompanied (if possible)              |                                     |                                                                                  |
|                       |                                                      |                          |        |                                                                                  | Waiting <15 min                            |                                     |                                                                                  |
| UK                    | Public Health England (PHE)                           | 20 August 2020           | Yes    | Surgical mask                                                                     | Social distancing (2 m)                    | Not recommended                     | Recommended AGP: 30 min in separated rooms                                      |
|                       | National Health System (NHS)                          | 27 October 2020          | Yes    |                                                                                  | Hand hygiene                               |                                     |                                                                                  |
| Country          | Organization                              | Date of Release     | Type of treatment | Treatment Low-risk                                                                 |
|------------------|-------------------------------------------|---------------------|-------------------|----------------------------------------------------------------------------------|
| Sweden           | Swedish Work Environment Authority        | 16 April 2020       | Urgent and elective | - Medical mask IIR  
- Eye protection (face shield)  
- Short sleeves  
- Gloves  
- Short sleeves  
- Body protection (disposable apron) |
| Switzerland      | Swiss Dental Association (SSO), Association of Cantonal Dentists in Switzerland (VKSZ) | 23 September 2020 | Urgent and elective | - FFP2 (if rubber dam not possible)  
- FFP2 (if rubber dam possible) |
| UK               | Public Health England (PHE)               | 20 August 2020      | Urgent and elective | - Surgical face mask (FRSM Type IIR)  
- Eye protection (goggles or face shield)  
- Gloves  
- Headwear (cap): not required  
- Body protection (apron)  
- Overshoes: not required |

### Treatment Low-risk (Continued)

| Treatment High-risk/COVID+ |
|----------------------------|

| Location & conditions |
|------------------------|

- Medical mask IIR  
- Eye protection (face shield)  
- Gloves  
- Body protection (disposable apron)  
- Phone  
- Clinic  
- PPE  
- Waiting area  
- Mouth rinses  
- Air ventilation  

- Type of treatment  
- PPE  
- AGP

- Hospital-dentistry clinic specially equipped, staffed and suited for handling of contagious infections.

- Specialized practice, clinics

- Designated urgent dental care (UDC) provision and primary dental care (NHS and private clinics)

| Location & conditions |
|------------------------|

- Hospital-dentistry clinic specially equipped, staffed and suited for handling of contagious infections.

- Specialized practice, clinics

- Designated urgent dental care (UDC) provision and primary dental care (NHS and private clinics)
TABLE 1 (Continued)

| Country Organization Date of Release | Triage | Patient measures | Air ventilation |
|-------------------------------------|--------|------------------|-----------------|
| US Centers for Disease Control and Prevention (CDC) 4 December 2020 14 December 2020 | Yes | Surgical mask (in areas with high community transmission) | Natural ventilation: at regular intervals (depending on size of the room, number of windows and doors, outside temperature and the airflow/wind). Mechanical ventilation: 6–10 exchange per hr. |
| EU European Centre for Disease Prevention and Control (ECDC) 19 October 2020 | Yes | Mask in areas with high community transmission | Natural ventilation: at regular intervals (depending on size of the room, number of windows and doors, outside temperature and the airflow/wind). Mechanical ventilation system: exchanged 6 to 10 times per hour, depending on the national standards. |
| Global organization World Health Organization (WHO) 3 August 2020 1 December 2020 | Yes | Medical or non-medical mask. In areas of known or suspected community or cluster SARS-CoV-2 transmission. | Increase ventilation and airflow according to the type of ventilation available, natural or mechanical or natural (average of 6–12 air exchanges per hour). Split air conditioning or other recirculation devices not recommended. Consider installation of filtration systems (exhaust fans, whirlybirds or HEPA filters). |

Abbreviations: AGP, aerosol generating procedures; CHX, chlorhexidine; CPC, cetylpyridinium chloride; FRSM, Fluid Resistant Surgical Mask; H₂O₂, hydrogen peroxide; HEPA, High Efficiency Particulate Air; PPE, personal protective equipment.
### Table 1

| Location & conditions     | Treatment Low-risk                                                                 | Treatment High-risk/COVID+                                                                 |
|---------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
|                           | **Type of treatment** | **PPE** | **AGP** | **Type of treatment** | **PPE** | **AGP** | **Location & conditions** | **PPE** | **AGP** | **Location & conditions** |
| **Urgent and elective**   |                       | **non-AGP** | **AGP** |                | **non-AGP** | **AGP** |                       | **non-AGP** | **AGP** |                       |
| Postpone elective         |                       | - FFP2/FFP3 or FFP3 (surgical mask in case of a shortage of respirators)         | - FFP2/FFP3 (surgical mask in case of a shortage of respirators)                      |                | **Urgent only** | - FFP2/FFP3 or FFP3 (surgical mask in case of a shortage of respirators)    |                |                  | Patients with confirmed COVID−19 should be referred to a designated dental care facility, which usually have a dedicated COVID−19 path and dedicated well-ventilated room. |
| treatments in areas with  |                       | - Eye protection (goggles or face shield)                                      | - Eye protection (goggles or face shield)                                          |                |                | - FFP2/FFP3 (goggles or face shield)                              |                |                  |                       |
| high community            |                       | - Gloves                                                                          | - Gloves                                                                          |                |                | - Gloves                                                  |                |                  |                       |
| transmission of COVID−19  |                       | - Body protection (water-resistant gown with long sleeves)                       | - Body protection (water-resistant gown with long sleeves)                        |                |                | - Body protection (water-resistant gown with long sleeves)     |                |                  |                       |
|                           |                       | **urgent and elective**                                                          | **postpone elective**                                                             |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **(elective postpone**                                                          | **in areas with high**                                                           |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **(elective postpone**                                                          | **community transmission of**                                                       |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **in areas with high community**                                                 | **COVID−19)**                                                                     |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **treatment rates or to official recommendations at national, sub-national or** | **at national, sub-national or local level.**                                    |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **agricultural level.**                                                          | **Urgent only**                                                                  |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **Delay elective treatments accordingly to COVID−19 transmission rates or to**    | **official recommendations at national, sub-national or local level.**            |                |                | **Urgent only**                                         |                |                  |                       |
|                           |                       | **Referral to a specialized oral health care services.**                         | **Referral to a designated dental care facility, which usually have a dedicated COVID−19 path and dedicated well-ventilated room.** |                |                | **Referral to a designated dental care facility, which usually have a dedicated COVID−19 path and dedicated well-ventilated room.** |                |                  |                       |
|                           |                       | **When appropriate, home visit by a dedicated oral health care team.**          |                                                                                  |                |                |                                                                                  |                |                  |                       |

**Abbreviations:** AGP, aerosol generating procedures; CHX, chlorhexidine; CPC, cetylpyridinium chloride; FRSM, Fluid Resistant Surgical Mask; H₂O₂, hydrogen peroxide; HEPA, High Efficiency Particulate Air; PPE, personal protective equipment.
hand hygiene (Belgium, Czech Republic, Germany, Greece, Sweden, Switzerland).

To reduce the number of people, present in waiting area at the same time, patients are asked to attend alone for their appointment except in exceptional circumstances (e.g., children, vulnerable), as clearly specified by the national guidelines of 26 out of 30 European countries (excluding Belgium, Czech Republic, Germany, Latvia), and the ECDC, WHO and CDC guidelines.

3.2.3 Mouth rinse

The WHO recommends the use of pre-procedural mouth rinses (i.e., 1% hydrogen peroxide or 0.2% povidone-iodine for 20 s) to reduce the viral load in the saliva. In 24 out of 30 selected European countries, the use of mouth rinses before dental treatments is suggested, as shown in Figure 1. Interestingly, the guidelines of all these countries include the use of mouth rinse containing hydrogen peroxide (H$_2$O$_2$), alone or in combination with other antiseptic products (Cyprus, Italy, Latvia and Lithuania), at a concentration of 1%–1.5%, when reported. In half of these countries (12 countries), povidone-iodine is proposed as an alternative to hydrogen peroxide, while in Cypriot guidelines the discretionary use of 1.5% H$_2$O$_2$ with 0.2% iodine solution is described. Only a minority of the guidance documents recommends cetylpyridinium chloride (CPC) alone (Spain and Germany) or in combination with chlorhexidine (CHX) (Malta and Italy). CHX is recommended as an adjunct antiseptic agent to other mouth rinses also in Latvia and Lithuania, while a possible single usage was only found in Croatian, German and Polish guidelines. Regarding CHX, the efficacy of its preoperative application is debated; therefore, it is explicitly not recommended in three national guidance documents (Bulgaria, Greece and Spain).

Other suggested products include alcoholic mouth rinse (Czech Republic) and dequalinium chloride/benzalkonium chloride, Listerine® cool mint, octenidine and sodium hypochlorite (Germany).

Preoperative mouth rinses for reducing the viral load prior to dental procedures are not recommended in the guidance documents of 5 countries (Denmark, Ireland, Scotland, Slovenia and UK), and the use of mouth rinses is not mentioned in national guidelines of one EU country (Estonia), and in the ECDC and CDC guidelines.

3.3 Air ventilation

Adequate air ventilation is recommended across most guidelines, but with no further specifications according to the type of ventilation available (mechanical or natural) and the type of patients undergoing dental treatments (low risk or high risk/COVID+).

The fallow time, when reported, varied between a minimum of 5 min (Spain) and 30 min (UK), with 15 min recommended by the majority of the guidelines (France, Hungary, Italy, Latvia, Lithuania, Luxemburg, Romania, Scotland, Switzerland). A fallow time of at least 10 min is recommended by the Slovenian guideline, while in the Maltese guidance document the fallow time ranges between 15 and 30 min depending on the presence of a window, availability of air purification methods and dealing with aerosol generation.

Concerns are raised by the WHO regarding the use of air conditioning or other kind of recirculation devices, while the installation of filtration systems has been advised. Air conditioning is not recommended in Hungarian and Scottish guidelines, while in French guideline the absence of a consensus among the experts is reported. Details on air conditioning usage and maintenance are indicated in the guidelines of three European countries (Italy, Netherlands and Portugal).

In a minority of guidelines, recommendations for mechanical ventilation are reported. In particular, details on air exchange per hour have been provided in the Belgian, Italian and Polish guidelines. The ECDC recommends 6 to 10 times exchanges per hour depending on the national standards. Similar values are also reported in the WHO and CDC guidelines. Finally, negative pressure ventilation was recommended by Dutch guidelines as preferred measure during the pandemic.

3.4 Type of treatment based on individual risk assessment

The type of treatment provided by dental health professionals in each country is based on individual risk assessment. Interestingly, no classification of elective and urgent/emergency treatments is provided in the majority of the guidelines. To make data comparable, it was decided to divide the patients in two categories, that is low-risk and high-risk/COVID+.

![Figure 1](https://example.com/image.jpg)
**Figure 1** Type of mouth rinses recommended in the 30 European countries. The results represent the number of countries which recommend specific type of mouth rinse(s). H$_2$O$_2$, hydrogen peroxide; CPC, cetylpyridinium chloride; CHX, chlorhexidine
For low-risk patients, both elective and urgent treatments have been recommended in all national and international guidelines, but two. Priority should be given to urgent dental problems, and reducing AGP is frequently encouraged. It is to be noted that in some countries, real-time PCR COVID-19 testing before the treatment is recommended regardless of the procedure to be carried out (Latvia) or limited to AGP (Denmark and Estonia). In Germany, real-time PCR COVID-19 testing for asymptomatic patients has been recommended. It is to be performed within 3 days prior to elective ambulant surgical treatments (not specific to dentistry) or prior to all dental treatments in case of very high incidence of disease. In the Romanian guidelines, no clear specification is provided for low-risk patients, whereas in the Polish guidelines, it has been emphasized that dental procedures should be limited to urgent cases. In France, it was emphasized that systematic real-time PCR testing in all patients is not indicated.

Regarding high-risk/COVID+ patients, if treatment cannot be postponed, urgent or emergency oral health care should be provided as indicated by the WHO, preferably avoiding AGP. All the guidelines agree that treatment should be carried out only if strictly necessary. Only in five guidelines this aspect is not reported or explicitly recommended (Bulgaria, Italy, Malta, Romania and Spain).

3.5 | Recommended PPE for dental health professionals for low-risk patients

The guidelines of all the included European countries except one (Romania) provide recommendations for appropriate PPE to be worn by dental health professionals for the management of low-risk patients and appropriate measures implemented in case of AGP. A graphic representation of the recommended PPE is provided in Figure 2 for non-AGP and in Figure 3 for AGP.

Beside non-AGP and AGP, in several guidelines, a third intermediate category in terms of risk of virus spreading is described. For instance, in the French guidelines, the AGP is split in staining and non-staining ones (i.e. under rubber dam). Furthermore, in the Maltese guidelines, splatter generating procedure is considered at medium risk. Similar division is reported in Dutch, Latvian, Polish, Scottish and UK guidelines. For the medium risk, the recommended type of PPE was similar to the one for AGP; therefore, it was decided not to present the results graphically.

The WHO recommends the use of surgical mask for non-AGP, while FF2/N95 mask or higher protection for AGP. Except for Romania, the guidelines of the other 29 selected European countries contain information on the type of masks for dental health professionals in case of low-risk patients. For non-AGP, surgical mask is advised by 21 European countries, of which 13 recommend surgical mask only (Austria, Croatia, Cyprus, Denmark, Estonia, France, Greece, Latvia, Luxembourg, Netherlands, Scotland, Sweden and UK), while in the other 8 the use of FF2/N95 mask or higher protection is preferable if available (Belgium, Germany, Italy, Lithuania, Malta, Poland and Slovenia). In the guidelines of the remaining 8 European countries (Bulgaria, Czech Republic, Finland, Hungary, Portugal, Slovakia, Spain and Switzerland), only the use of FF2/N95 mask or higher protection is recommended for non-AGP. In Germany, different recommendations were available for dentists in private practice (surgical mask recommended) and for employed staff including dentists and nurses. For the latter, recommendations are issued by the Federal Office for Occupational Safety and Health, which recommends FF2 mask to be worn by dentists for all treatments in which patients are not advised to wear masks. For AGP, the use of FF2/N95 mask or higher protection is recommended in the majority of European countries (25/30), of which 5 contemplate surgical mask as an alternative (Belgium, Germany, Ireland, Poland and Sweden). In 4 countries, surgical mask represents the only type of mask recommended for AGP (Austria, Denmark, Luxembourg and Netherlands). In this context, the Austrian guideline emphasizes the liberal character of the dental profession and the related

FIGURE 2 Type of personal protective equipment (PPE) recommended in the national guidelines of the 30 European countries for non-aerosol generating procedure (non-AGP). The results represent the number of countries which recommend specific type of PPE.
responsibility to select appropriate PPE. In the ECDC guidelines, surgical masks are recommended in case of a shortage of respirators. The selection of the type of mask should be taken into consideration according to the local prevalence of COVID-19 and the probability that the consultation will include AGP. Similar recommendations are reported in the CDC guidelines.

Regardless of the type of procedure, adequate eye protection is considered fundamental by the WHO, which encourages the use of goggles or/and face shield covering the front and sides of the face. Similar advice has been also reported in the ECDC and CDC documents. In Europe, the use of face shield is recommended for both non-AGP and AGP in 22 out of 30 countries, while in Austria and Ireland it is indicated for AGP only. In 3 of 6 European countries not listing face shield as recommended PPE, other means of eye protection are suggested (Estonia, Germany and Luxemburg), whereas in 3 others no information has been reported (Greece, Romania, and Switzerland).

Gloves are considered standard PPE for dental procedures (WHO). The use of gloves is recommended in the national guidelines of 22 European countries, as well in the ECDC and CDC documents. Interestingly, double gloving is recommended for performing AGP in two countries (Portugal and Spain).

The use of protective headwear, in particular surgical cap, is advised by 13 European countries for both non-AGP and AGP (Bulgaria, Croatia, Cyprus, Czech Republic, France, Hungary, Italy, Lithuania, Malta, Poland, Portugal, Slovakia and Slovenia), whereas in 5, protective headwear is limited to AGP (Austria, Ireland, Latvia, Spain and UK). No information on head protection is reported in the ECDC, WHO and CDC guidelines.

The WHO recommends the use of fluid resistant disposable gown for both non-AGP and AGP. It must be stressed that due to the use of translation tools, it was hard to discern the differences between apron, surgical gown and coverall in some cases. Therefore, it was decided to put them in a single category. 26 European countries (out of 30) suggest the use of body protection for AGP, while only in 15 countries their use is suggested also for non-AGP (Bulgaria, Croatia, Denmark, Estonia, Hungary, Italy, Lithuania, Malta, Netherlands, Poland, Portugal, Scotland, Slovakia, Slovenia and UK). No information regarding body protection is provided in the guidelines of 4 European countries (Germany, Greece, Luxemburg and Romania). In accordance with WHO indications, the use of waterproof gown with long sleeves is advised by the ECDC and CDC guidelines.

Regarding overshoes, no information is reported in the majority of the European national guidelines (19 out of 30), as well in the ECDC, WHO and CDC ones. The use of overshoes is advised by 4 countries regardless of the type of the procedure (Italy, Malta, Poland and Spain), while only for AGP in Belgium, Lithuania and Portugal. Moreover, their use is not required in another 4 countries (France, Ireland, Scotland and UK).

Further rarely mentioned PPE includes clinical footwear (Malta, Netherlands, Portugal and Spain), disposable sleeves (Italy) and cowls (Portugal).

3.6 | Recommended PPE for dental health professionals for high-risk/COVID+patients

In the majority of the European countries (27/30), specific recommendations regarding PPE to be used when treating high-risk/COVID+patients are provided. No specific PPE for high-risk/COVID+patients is recommended in the Austrian, French and Spanish guidelines.

Overall, maximum protection is generally recommended for these patients and no distinction on PPE for non-AGP and AGP is provided. This is probably because it is strongly encouraged to avoid AGP in these patients.

The WHO recommend the use of respirators (i.e. N95 or FFP2 or FFP3 standards, or equivalent), especially for AGP, as well as face shield and body protection. These protective measures are
recommended in the guidelines of all the 27 European countries providing information on PPE for high-risk/COVID+ patients. The use of protective headwear is also recommended in these countries except for Denmark, Ireland, Scotland, Switzerland and UK. Similarly, the ECDC and CDC guidelines suggest all the above-mentioned PPE apart from surgical caps.

Double gloving is recommended in Croatia, Czech Republic, Poland and Portugal. Moreover, vinyl gloves should not be used for these patients according to UK guidelines.

Overshoes are recommended in (Germany, Greece, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Slovakia and Slovenia), while they are not listed among the recommended PPE in the ECDC, WHO and CDC guidelines.

3.7 | Locations and conditions indicated for the treatment of high-risk/COVID+ patients

High-risk/COVID+ patients should be referred to specialized oral health care services accordingly to WHO, which also foresees the possibility of home visit by dedicated teams in case of need.

In the majority of the European countries, (22 out of 30) high-risk/COVID+ patients should be treated in dental clinics / university hospitals, which constitute the only permitted locations for these patients in 12 countries (Austria, Croatia, Cyprus, Denmark, Estonia, Latvia, Lithuania, Netherlands, Poland, Slovakia, Slovenia and Sweden) (Figure 4). Dental clinics / university hospitals represent alternatives to specialized care centres in 6 countries (Greece, Hungary, Luxemburg, Scotland, Switzerland and UK) and to both specialized and general practices in 4 countries (Belgium, Germany, Ireland and Malta). In Finland, all dentists can provide care to high-risk/COVID+ patients, whilst in the guidance documents of the remaining European countries the appropriate dental setting for the treatment of these patients is not specified.

Reported measures to reduce the risk of nosocomial transmission include isolation rooms, mechanical ventilation, air disinfection, longer fallow time and considering scheduling the appointment at the end of the working day.

Both the ECDC and CDC guidelines recommend the referral of these patients to designated dental care facility, which usually have a dedicated COVID-19 path and well-ventilated rooms.

4 | DISCUSSION

This review was conducted to summarize and assess the homogeneity of the most recently published COVID-19 guidelines on infection control and prevention related to dental care in European countries. It revealed that all the included countries published specific guidelines in 2020.

Briefly, all countries recommended remote triage. The majority (29/30) countries also recommended patient mask wear, hand hygiene (24/30) and social distancing (29/30), thus following WHO recommendation from August 2020. Antiseptic mouth rinses with potential virucidal properties were recommended by over two thirds of the countries (23/30). Beneficial effects of air ventilation were mentioned in the majority of the guidelines (28/30), while the minority (13/30) included specifications about fallow time and air exchanges per hour. Urgent treatments were only recommended for high-risk/COVID+ patients, while also most countries recommended the continuation of elective treatments of low-risk patients (28/30).

For non-AGP, the majority of countries found surgical masks (21/30) to be sufficient, whereas 16/30 emphasized possible benefits of FFP2/FFP3 masks. Moreover, face shield (22/30) and body protection (15/30) were recommended frequently. For AGP, few countries found surgical masks to be sufficiently protective (7/30) and four of these countries specified that surgical masks should be used only when FFP2/FFP3 masks are not available. Thus, the majority of countries recommended using FFP2/FFP3 masks (25/30) for AGP. Face shields (24/30), body protection (25/30) and headwear (17/30) were also recommended by the majority of included countries. It has to be noted that the recommended PPE measures were meant to be applied by all staff members including nurses. However,
in one country (Germany), national authority (Federal Institute for Occupational Safety and Health) recommended stricter PPE measures for employees in medical settings than those suggested in dental guidelines.

Regarding high-risk/COVID+ patients, most of the guidelines provided information of recommended PPE (27/30) and locations (24/30) for dental treatments, but the conditions were generally not indicated. All countries specifying PPE recommended maximum protection for the treatment of high-risk/COVID+ patients.

The term "triage" describes the process of separating patients into groups based on their needs and possible benefit for urgent treatment. The rationale behind telephone triage is to identify patients with the highest priority for treatment and/or the patients with high risk of COVID-19 transmission. This process is based on risk assessment, including epidemiological history and clinical symptoms, often followed by patient questionnaire (Gurzawska-Comis et al., 2020). To make triage efficient, it needs to be based on detailed algorithms (Programme, 2007), but also, on clinical judgement and shared decision making to determine whether patient management should continue remotely or face to face. Dentists worldwide had to adapt rapidly to remote patient consultation. The future will show if these types of communication tools will be used even after pandemic.

Following the patients' journey after remote triage and their allocation for elective or urgent treatment, it is important that their visit is as safe as possible. Therefore, a number of measures have been implemented and used worldwide, such as hand hygiene, 1–2 m distance and mouth and face cover (ECDC, 2020; WHO, 2020) to limit the risk of SARS-CoV-2 transmission in our daily life. Additional measures for employees in medical settings than those suggested in dentistry when COVID-19 incidence is particularly high. The negative test is not providing 100% evidence that a patient is not SARS-CoV-2 positive (false negative); however, it is considered to be the most predictive measure available before hospital admission. The other advantage of pre-treatment real-time PCR test is the detection of asymptomatic patients, whose number can be particularly high in areas of high COVID-19 prevalence (Pollock & Lancaster, 2020; WHO, 2020). However, none of the international guidance documents (WHO, ECDC) recommended the use of real-time PCR test before attendance for dental treatment.

Another important, rather controversial, measure is air ventilation that has been vaguely specified by the majority of the guidelines. Only few guidelines, including CDC, ECDC and WHO, reported details on natural ventilation, mechanical ventilation and air conditions. However, Germany even opposed additional mechanical ventilation systems including HEPA filters due to limited evidence. In contrast, Switzerland opposed AGP in the absence of proper ventilation. The treatment room should have 6–12 air changes per hour (ACH) as recommended by WHO that should correspond to fallow time. The fallow time has been reported only by 48% international guidance according to Clarkson et al., (2020), while our results showed that 43% of countries (13/30) recommended it, most frequently mentioning fallow times of 5 to 30 min (15 min recommended by the majority of guidelines). Our search did not reveal the difference between fallow time for low-risk and high-risk/COVID+ patients. However, Clarkson et al., (2020) and Programme (2007) proposed fallow time depending on ACH, use of rubber dam and high-volume suction that varies between 10 and 60 min. If ACH is >10 and the high-volume suction and rubber dam are used, the fallow time of 10 min was recommended that is in accordance with a recent experimental study (Allison et al., 2021). The lack of specifications regarding air ventilation in national guidelines might be related to number of variables that affect fallow time including room volume, size of windows, air flow vectors, temperature, humidity and characteristics of aerosol particles (Sergis et al., 2020). In addition, WHO 2009 indicated that natural ventilation alone cannot satisfy the recommended ventilation requirements and alternative ventilation systems such as a hybrid (or if required mechanical) ventilation system should be considered. The rationality about adequate air ventilation is to reduce risk of airborne virus transmission; nevertheless, no consensus on specific ventilation measures is currently available in guidelines.

The type of treatment offered by dental care during pandemic in each country is based on risk assessment, and in this review, it was divided into low risk and high risk/COVID+. For patients with a low-risk COVID-19 (including potentially asymptomatic), the majority of countries recommended both elective and urgent treatments (except of Poland and Romania). Definition of emergency, urgent and
elective treatment, was not consistent and not always provided. It has to be highlighted that the majority of national guidelines recommended to prioritize the urgent treatments, limit elective treatments and avoid AGP if possible. Polish guidelines advised only urgent treatment; however, it has to be noted that they have not been updated since March 2020. The Romanian guidelines did not specify which treatment should be offered to patients with low COVID-19 risk.

The classification of AGP and non-AGP raised debate among clinicians and scientists, due to lack of robust evidence regarding the nature of generated sprays depending on the procedure, as well as contamination from respiratory and oral fluids. The WHO defines AGP as any medical, dental or patient care procedure that results in the production of potentially infectious airborne particles <5 µm in size (aerosols), which can remain suspended in the air and inhaled (World Health Organization, 2014). The risk of SARS-CoV-2 transmission by performing AGP in dentistry has been classified as high (Allison et al., 2021; Sergis et al., 2020). The procedures classified as AGP are debatable, and only few guidelines specify them. According to this category, appropriate PPE has been advised by some countries such as Croatia, Estonia, France, Latvia, Netherlands, Poland, Scotland, Switzerland and UK.

Regarding the use of mask, during the first wave of pandemic, the majority of the European countries advised FFP2 or FFP3 wear (Becker et al., 2020; Gurzawska-Comis et al., 2020). However, new scientific evidence has been published concerning the risk associated with different dental procedures high (Allison et al., 2021; Sergis et al., 2020). Type of mask was the only type of PPE that was specified by all included countries due to importance of protection from airborne SARS-CoV-2 transmission. It has to be highlighted that some countries like UK and Scotland changed the guidelines after the first wave of pandemic and did not recommend any more the use of FFP3 for surgical procedure using slow handpiece (<60,000 rpm), including implant procedures instead the advice was to use fluid resistant surgical mask type II (FRSM Type IIR). In addition, the mask should be well fitted and covering both nose and mouth.

Gloves were mentioned as the second most frequently type of PPE by all European national guidelines. Double gloving was recommended, for example by Croatia, Czech Republic, Germany, Poland, Portugal and Spain. However, there is limited evidence that it might decrease the risk of contamination (Verbeek et al., 2020).

Eye or face protection (including full-face visors/face shields) was recommended by 73% for non-AGP and 83% for AGP of European countries, and it was in agreement with WHO, ECDC and CDC guidelines. Additionally, some countries recommended eye protection by lateral closing goggles (Germany, Estonia and Luxembourg). According to a systematic review by Chu et al., (2020), face shields could confer additional benefit to wearing medical masks to protect against infection (Chu et al., 2020). However, no randomized trials were identified showing that these interventions provide higher protection from infection.

Body protection has been identified in guidelines with three types, namely apron with or without long sleeves, full-body gowns and coveralls. Our results showed that 52% of guidelines recommended use of body protection (aprons or gowns) for non-AGP and, while 83% for AGP, which is in line with the higher transmission risk assumed for AGP. Coveralls were recommended for high-risk patients and confirmed COVID cases only. The need for changing the body protection between patients, immediately after completing a procedure, as well as the technique for doffing was frequently highlighted.

The current situation of pandemic is very challenging especially for the dentists working in the front line, providing urgent treatments for high-risk/COVID+ patients. Therefore, it is crucial to have clear information on appropriate protection measures. Although 23% of countries did not specify locations and conditions for the treatment of these patients, almost all countries (90%) responded to the need for definition of appropriate PPE, consistent with maximum protection: FFP2/FFP3, gowns or coveralls, headwear and face shields/goggles. Regarding location, treatment in hospital settings was frequently recommended (73%). Some guidelines further specified treatment condition, that is in isolation or negative pressure rooms. Interestingly, Poland introduced mobile clinical facilities called “dentobus” to support dental care for COVID+ patients.

This review focussed on summarizing and assessing the homogeneity of the recent versions of national guidelines of European countries for the management of dental care during COVID-19 pandemic. Due to the similar legislation and strong connection among the included countries, it was decided to limit the present review to Europe. Consequently, the main limitation of the present review is that it does not reflect the worldwide situation. Other countries with high population such as Russia and Turkey were not included as they did not fulfil the requirement of being closely connected to European Union. However, Turkish recommendations were in line with the majority of European guidelines and suggested patient mask wear, pre-procedural mouth rinse and PPE such as surgical masks/FFP2 masks, face shields and body protection (Turkish Ministry of Health, 2020). The Russian guideline, in contrast, only specified treatment of COVID+ patients and measures for air ventilation (Minister of Health of Russian Federation, 2021). In most countries, an official English version of the guidelines is not provided by the organizations, so further transparency and ease of comparison is not available. This also led to the involvement of several colleagues supporting with the translation and the data extraction, in addition to the use of translation tools. Furthermore, it was decided not to summarize information on surface disinfection as this aspect was extensively discussed in our previous paper (Gurzawska-Comis et al., 2020).

Another limitation is that several guidelines were published during the first wave of pandemic. Despite a high number of articles on COVID-19 published in the second half of 2020, several guidelines did not reflect the most recent evidence. Hence, further systematic reviews and clinical trials are needed to better understand which measures should be applied during day-to-day dental practice.

Previous pandemics encouraged the introduction of new infection control and prevention regulation and measures to decrease the transmission of blood-borne as well as airborne diseases (Klevens &
Moorman, 2013; Samaranayake & Peiris, 2004). It can be expected that a similar scenario will result in case of COVID-19 and additional measures may become part of our daily practice, such as remote consultation or FFP2/FFP3 usage for AGP.

In conclusion, this review revealed that AGP is considered to be associated with high risk of COVID-19 transmission during pandemic. Therefore, higher protection has generally been recommended for this type of procedures. The risk arising from potentially asymptomatic patients not wearing mask during non-AGP appeared to be unclear, which is reflected by the heterogeneity of guidelines. Moreover, recommendations on air ventilation were mostly vague and no detailed specification of conditions for the treatment of high-risk patients was provided by the majority of guidelines. Overall, the current European guidelines are following the recommendation of the international organizations (ECDC, WHO and CDC).

In the future, the introduction of vaccination and the decrease of COVID-19 incidence could initiate new standards for IPC in dentistry. We believe that the dynamic of pandemic will have beneficial impact on revision of European guidelines, favouring more homogenous/standardized recommendations on infection control and prevention in dentistry across Europe.

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CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest related to this study.

AUTHOR CONTRIBUTION

Kathrin Becker: Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Visualization (equal); Writing-original draft (equal); Writing-review & editing (equal). Giulia Brunello: Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Visualization (equal); Writing-original draft (equal); Writing-review & editing (equal). Björn Klinge: Conceptualization (equal); Investigation (equal); Supervision (equal); Writing-original draft (equal); Writing-review & editing (equal).

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