DENTISTRY

CLINICAL GUIDELINES

COVID-19

Scientific paper drawn up by the COVID-19 MD group aiming the dissemination of the knowledge about the clinical practice in Dentistry in the context of COVID-19.

IMPRENSA DA UNIVERSIDADE DE COIMBRA
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The expression *Clinical Guidelines* refers to a scientific methodology and type of publication arising from it. This document should not, thus, be understood as legislation nor as any type of imposition of regulatory or legal nature. It is a scientific contribution to the broadening of the knowledge about the professional practice in the context of COVID-19, hopefully serving its recipients.

Authors

Fernando Guerra

Dentist

Full Professor at the Faculty of Medicine of the University of Coimbra

Director of the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0001-8780-9379

António Duarte Mata

Dentist

Full Professor at the Faculty of Dentistry of the University of Lisbon

Coordinator of the LIBPhys-UL Research Unit-UID/FIS/04559/2013, Faculty of Dentistry, University of Lisbon

Main Researcher of the Research Group in Oral Biochemistry and Biology, GIBBO FMDUL

https://orcid.org/0000-0003-1474-2681

Alexandra Vinagre

Dentist

Guest Assistant at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0001-6929-3807

Ana Luísa Costa

Dentist

Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0002-4102-1719

Andreia Luís Vieira

Dentist

Guest Assistant at the Faculty of Dentistry of the University of Lisbon

Researcher of the Research Group in Oral Biochemistry and Biology, GIBBO FMDUL

https://orcid.org/0000-0002-3271-8645

Carlos Falcão

Dentist

Assistant Professor at the Faculty of Health Sciences of the Fernando Pessoa University

https://orcid.org/0000-0001-8031-6176

Carlota Duarte de Mendonça

Dentist

Researcher of the Research Group in Oral Biochemistry and Biology, GIBBO FMDUL

https://orcid.org/0000-0001-6133-1995

Catarina Chaves

Doctor

Hospital Assistant in Clinical Pathology

Head of the Laboratory of General Bacteriology

Service of Clinical Pathology, Medical Teaching Hospital of Coimbra

https://orcid.org/0000-0003-0131-5728

David Herrera

Odontologist

Professor at the Faculty of Dentistry of the Complutense University of Madrid

Vice-Dean at the Faculty of Dentistry of Madrid, Spain

https://orcid.org/0000-0002-5554-2777

Isabel Poiares Baptista

Dentist

Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0003-4503-5365

Ivan Toro

Dentist

https://orcid.org/0000-0002-0437-4152

João Braga

Dentist

Assistant Professor at the Faculty of Dentistry of the University of Oporto

https://orcid.org/0000-0002-0895-1009

João Carlos Ramos

Dentist

Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0003-1965-1092

João Miguel Santos

Dentist

Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0002-2865-9689

João Miguel Silveira

Dentist

Assistant Professor at the Faculty of Dentistry of the University of Lisbon

Researcher at the LIBPhys-UL Research Unit-UID/FIS/04559/2013, Faculty of Dentistry, University of Lisbon

Researcher of the Research Group in Oral Biochemistry and Biology, GIBBO FMDUL

https://orcid.org/0000-0001-9366-0662

João Paulo Tondela

Dentist

Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0003-0787-7713

Paulo Palma

Dentist

Guest Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0003-4730-8072

Pedro Nicolau

Dentist

Associate Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0001-7900-4482

Pedro Sousa Gomes

Dentist

Associate Professor at the Faculty of Dentistry of the University of Oporto

Researcher at the Center of Research Bone Lab of the Faculty of Dentistry of the University of Oporto

https://orcid.org/0000-0001-5365-2123

Ricardo Dias

Dentist

Guest Assistant at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0002-0824-9754

Salomão Rocha

Dentist

Guest Assistant at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0002-5702-333X

Sérgio Matos

Dentist

Assistant Professor at the Faculty of Medicine of the University of Coimbra

Researcher at the Center of Research and Innovation in Dental Sciences of the Faculty of Medicine of the University of Coimbra

https://orcid.org/0000-0002-2548-4326

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Advisory Board

Doctor Ana Lúcia de Pereira Neves Messias

Guest Teaching Assistant at the Faculty of Medicine of the University of Coimbra

Professor Professor Aníbal Diógenes

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Dentist

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Full Professor at the Mechanical Engineering Department of the University of Coimbra

Doctor and Professor Maria Helena Raposo Fernandes

Full Professor at the Faculty of Dental Medicine of the University of Porto

Doctor and Professor Mário Bernardo

Coordinator of the Integrated Master Degree in Dental Medicine at the Faculty of Dental Medicine at the University of Lisbon

Doctor and Professor Mário Bernardo

Full Professor at the University *Complutense* of Madrid, Spain

Doctor and Professor Marlene Barros

Head of the Faculty of Dental Medicine of the Catholic University of Portugal

Doctor Paulo Manuel de Oliveira Nunes

Dentist

Doctor Nuno Ventura

Dentist

Doctor Ricardo Jorge Martins

Dentist

Doctor and Professor Sandra Gavinha

Head of the Faculty of Health Sciences of Fernando Pessoa University

These Clinical Guidelines are composed of three documents:

- Clinical Guidelines themselves. Grouped in a document which contains every issue that has been drawn up regarding the professional practice in pre-, peri- and post-intervention. It contains every information, adopted methodology, results, levels of evidence and bibliography;
- Clinical Guidelines in a nutshell. A presentation which contains nothing but the Key Points, that is to say, the recommendations themselves, listed in a simple way, in order to facilitate their consultation;
- Clinical Guidelines, schemes and checklists. Document containing the infographic necessary to their implementation.

A quality clinical decision rests on three assumptions:

- The patient's interests; if the clinical decision doesn't satisfy him/her, it will have failed miserably its main goal;
- The practitioner's experience as a key element unifying his/her acumen, knowledge and even intuition, the so-called human factor;
- The scientific evidence as a basis of reliable, objective and essential information.

The Clinical Guidelines presented here intend to be that basis of information and knowledge, objectives which are key to support the clinical decision.
Every theatre of clinical practice has its own specificities. In this context, these Clinical Guidelines do not constitute hermetic orders to abide by, but only a robust body of knowledge allowing the practitioner to set up the implementing protocol which best suits the characteristics of each clinic.

It should also be added that the adoption of these guidelines doesn't guarantee zero risk of acquisition of the infection.

List of Abbreviations

A/H1N1 = *Influenza A virus subtype H1N1*

ABAS = Alcohol-Based Antiseptic Solution

ACE2 = Angiotensin-Converting Enzyme 2

AIDS = Acquired Immunodeficiency Syndrome

CDC = *Centers for Disease Control and Prevention*

CI = Confidence Interval

COVID-19 = Coronavirus disease 2019

DGS = Portuguese Health Authority

DNA = Deoxyribonucleic Acid

EU = European Union

FFP = *Filter Face Piece*

FRSM = *Fluid Resistant Surgical Mask*

HEPA = *High Efficiency Particulate Arrestor*

HVAC = Heating, Ventilation and Air Conditioning

MERS-CoV = *Middle East Respiratory Syndrome Coronavirus*

NICE = *National Institute for Health and Care Excellence*

NIOSH = *National Institute for Occupational Safety and Health*

OMD = Portuguese Dental Association

PCR = *Polymerase Chain Reaction*

PPE = Personal Protective Equipment

RCT = *Randomized Clinical Trial*

RNA = Ribonucleic Acid

rRT-PCR = *Real Time Reverse Transcription Polymerase Chain Reaction*

SARS = *Severe Acute Respiratory Syndrome*

SARS-CoV = *Severe Acute Respiratory Syndrome Coronavirus*

UVC = Type C Ultraviolet

WHO = World Health Organization

Preliminary remark

Given the fact that the COVID-19 disease is an extremely recent one and that, consequently, there is a natural gap in the amount and quality of scientific evidence on this subject, the drafting of some classical Clinical Guidelines is not possible. In this context, these Guidelines were drawn up according to the protocol recently made available by the English National Institute for Health and Care Excellence (NICE), namely the Interim process and methods for developing rapid guidelines on COVID-19 (nice.org.uk[1]).

These Clinical Guidelines are the result of the work developed by a committee of dentists.

There was no public consultation of representatives of every potential stakeholder about this topic. The goal is to produce Clinical Guidelines which might reduce the entropy and promote the consistency of intervention. However, an advisory board composed of different figures was created so as to review the Clinical Guidelines and proceed to its assessment, the composition of this board being listed in Appendix I.

We promote the identification of the key issues applicable to the scenarios upon return to the clinical practice in dentistry.

No systematic reviews of the literature were conducted. Even though searches were made in the most widely used databases, the main information contained in these Clinical Guidelines stems from the use of guiding documents previously published concerning pandemics that have already occurred.

As expected, there is very scarce literature regarding COVID-19, wherefore a great deal of the alternative basis of evidence we resorted to refers to *Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), Swine Pandemic (AH1N1) Influenza A and to Middle East Respiratory Syndrome Coronavirus (MERS-CoV)*

The databases of choice were:

1. Guides of the World Health Organization (WHO) on COVID-19
2. Recommendations of the Portuguese Health Authority (DGS)
3. NICE and SIGN
4. Cochrane collaboration
5. MEDLINE (via PubMed)
6. International and national scientific societies
7. The available evidence was simply ranked
    - The strategy of search is reproduced in Appendix II, section 2
    - Priority has been given to systematic reviews and meta-analysis
    - Followed by the search for randomized clinical trials
    - Followed by observational studies
    - Whenever it proved impossible, we searched for publications arising from the observation of experts in previous experiences
    - In those cases where no kind of evidence could be found, the experts who are the authors of these guidelines drew up the recommendations through discussion and consensus based primarily on biological plausibility.

We have made a summary critical assessment of the literature but we have not formally assessed the risk of the presence of biases resorting to specific scales.

However, we always briefly and simply indicated the kind of information underlying the clinical recommendations that were produced.

Objectives

Identify and classify the risks of acquisition and spread of SARS-CoV-2 in the context of pre-, peri-, and post-intervention in oral health.

Produce recommendations on how to act in pre-, peri-, and post-intervention in oral health for every element present at the clinical theatre aiming to minimize the risk of acquisition and/or spread of SARS-CoV-2.

Scientific Relevance

Given that:

Over the course of the actual pandemic of COVID-19 several sources have identified the activity of dentistry as being at the top of the pyramid as far as the risk of acquisition and spread of the virus SARS-CoV-2 is concerned due to the enormous generation of aerosols which characterize it, the Portuguese government having determined the provisional closure of the clinics of dentistry and stomatology.

Currently, there are no national Clinical Guidelines which convey recommendations on how to act on every step of pre-, peri-, and post-intervention in dentistry aiming the prevention of the acquisition and spread of the virus SARS-CoV-2.

There is, therefore, the need to create these Clinical Guidelines as a set of recommendations on how to act, allowing the return to the activity of dentistry in safe conditions of those involved at the clinical theater, whether they are professionals, partners of the sector or the user population in general.

It should be noted that the Clinical Guidelines intend to support the clinical decision. It is not a document which might replace the clinical decision, but rather one which the practitioner can lean on whenever he/she must choose the best course of action considering his/her experience, the patient's specific interests and the very clinical theater in which the practice takes place. It is not, therefore, a document which aims the tyrannization of evidence over the choice, but one which only allows to decide taking into consideration the greatest robustness of evidence possible.

Topic/Disease

COVID-19 - Minimization of the risk of acquisition and spread of the disease in dentistry in the context of the pandemic.

Category

These are Clinical Guidelines on clinical governance advice, best practice and clinical safety.

Target Population

Patients of dentistry and members of the oral health staff.

Recipients of the Guidelines

All the parties concerned, namely: dentists, stomatologists, odontologists, pharmacists, nurses, oral hygienists, dental prosthetic technicians, clinic's support auxiliary personnel, receptionists, administrative staff, diagnosis and therapy technicians, senior technicians of safety and hygiene at work, technicians of clinical analysis, suppliers of dental material and equipment, medical sales representatives, maintenance technicians, waste collection technicians, professional associations, scientific societies, education institutions, students of dentistry, hospitals, insurance companies and conventions, commercial and industrial partners, policy makers, Portuguese Dental Association, Portuguese Health Authority, sectoral regulatory bodies and patients.

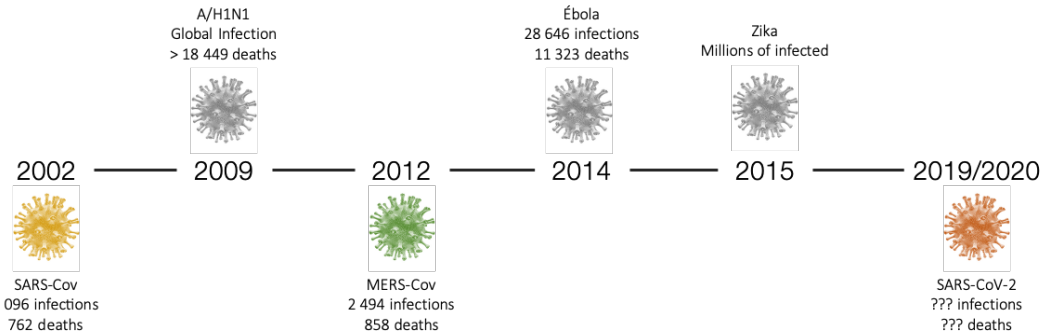
Introduction

Origin of the Infection

Throughout history mankind has been faced with cyclical microbiological outbreaks (Figure 1). Among the most recent ones we can point out the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), which originated in China, in 2002; the Swine Pandemic (A/H1N1) Influenza A, which shook Mexico in 2009; and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV), embryonic in Saudi Arabia in 2012[2].

In December 2019, a series of cases involving a new virus responsible for an acute respiratory syndrome was detected in Wuhan, China. It is a zoonosis-like infection (originating in a bat) whose causative agent is a new strain of coronavirus, SARS-CoV-2. This virus, which was isolated on 7th January 2020, presents 50% of genetic homology with MERS-CoV, 79% with SARS-CoV-1 and is the causative agent of a new disease, COVID-19.

Figure 1 - Epidemiology. Biological Outbreaks. Adapted from Jiuyang Xu, et al. 2020[Xu, J.; Chen, Y.; Chen, H.; Cao, B. 2020].



Epidemiology

Over a short period of time, COVID-19 has grown to pandemic proportions, being present in every continent to the exception of Antarctica. Around the time when this text is being written there are 2.626.321 cases all over the world and 181.938 confirmed fatalities (data supplied by the WHO on 24th April 2020). In Portugal, 23.392 cases and 880 fatalities (data supplied by the DGS on 25th April 2020) are reported. However, by the time the readers have access to this document, all these figures will have increased.

The WHO, the American Centers for Disease Control and Prevention (CDC) and modern databases keep an updated interactive epidemiologic map.

There are few indications about the actual prevalence of the disease among dentists. The scarce existing sources indicate that the dental class, even though they are at the top of the chain of potential susceptibility and transmissibility due to the high generation of aerosols, presents a very low prevalence of the disease comparing to other professions in the area of health.

It is not possible, at this stage, to state whether the low prevalence of cases of COVID-19 among oral health professionals is due to the early closure of the care units in consequence of the generalized confinement, or if it results, in effect, from the use of strict protocols of asepsis and prevention of cross infection implemented long ago and resulting from the pandemics by AIDS and Hepatitis B and C viruses.

It should, however, be noted that one of the few studies available in these matters was conducted in Wuhan, during the epidemic stage, in a large clinic housing more than 1.000 professionals, the prevalence of COVID-19 having reached 0,9%.

Virus Structure and Physiopathology

The physiopathology of this new entity is not fully known. Up till now several hypotheses have been outlined which lack confirmation by different kinds of studies[4].

It is known that SARS-CoV-2 (60-90 nm) belongs to the genus *Betacoronavirus*, subgenus *Sarbecovirus*, *Coronaviridae* family, related to the SARS[2, 4-8]. It is a positive simple chain RNA (ribonucleic acid) virus with the potential to infect vertebrates[4, 7]. Besides sharing 79,5% of its genomic sequence with SARS-CoV and the preservation of eight out of the fourteen residues of amino acids of SARS-CoV in the new coronavirus, the mechanism of cellular invasion in the host is also shared by these two viruses: through the receptor and the angiotensin-converting enzyme 2 (ACE2 - a membrane receptor widely diffused by the cells of the organism, including the oral cavity which may be a gateway for the virus). Notwithstanding, the affinity for the receptor is 10 to 20 times higher as far as the new coronavirus is concerned[2-4, 6, 9, 10]. Eight out of the fourteen residues of amino acids of SARS-CoV are preserved in the new coronavirus[4].

One of the challenges of this virus has to do with the genomic mutation which occurred during the worldwide dissemination[9].

Clinical Manifestations and Forms of Presentation of the Disease

The diagnosis of a patient infected with SARS-CoV-2 includes the screening for the signs and clinical symptoms, and the assessment of the epidemiologic risk[4].

The most common signs and symptoms are[4, 5, 11]:

- Fever, in 82% of patients (confidence interval (CI) 95%: 56-99%; *n* = 4410);
- Cough, in 61% of patients (CI 95%: 39-81%; *n* = 3985);
- Muscular pains/fatigue, in 36% of patients (CI 95%: 18-55%; *n* = 3778);
- Dyspnea, in 36% of patients (CI 95%: 18-55%; *n* = 3778);
- Sore throat, in 10% of patients (CI 95%: 5-17%; *n* = 1387);
- Headaches, in 12% of patients (CI 95%: 4-23%; *n* = 3598);
- Diarrhea and vomiting, in 12% of patients (CI 95%: 4-23%; *n* = 3598);

The symptoms may appear 3 to 6 days after the exposure to the agent[6]. Additionally, the patient may present dysgeusia, however rare, which justifies the tropism of the new coronavirus compared to the well-known SARS-CoV, MERS-CoV and A/H1N1[8].

Regarding the epidemiologic risk, the following aspects are taken into account (for every point below, consider 14 days following the beginning of the symptoms)[4]:

- History of international trips;
- Close contact (<2 m distance) with patients infected with SARS-CoV-2 (confirmed by lab test);
- Healthcare professionals having worked in an environment where patients suffering from acute respiratory infection were present;
- Quick deterioration of the health condition upon returning home;
- Presence in hospitals or health units in countries where the infection by SARS-CoV-2 was reported.

In imaging terms, the X-rays display bilateral opacities (similar to ground-glass) and a thickening of the pulmonary texture. In CAT scans it is possible to observe a thickening of the septum, ground-glass opacities and pulmonary consolidation[6, 8, 11].

The affection of the respiratory system is directly related to its vulnerability to the inoculation of pathogens, associated to the contact of infected droplets with the oral, nasal or ocular mucosa, or even directly through the external airway[2].

The difficulty of diagnosing this disease focuses on the fact that the clinical condition presents unspecific symptoms and, very often, indistinguishable from other respiratory pathologies. Symptoms like headaches, sore throat and gastrointestinal discomfort must not be neglected[11].

The clinical condition of a patient infected with SARS-CoV-2 may range from the presence of a mild upper respiratory infection to SARS[6, 10]. The severity of the clinical condition is predictive of a bad prognosis. The presentation of the disease is divided into not serious and serious cases. The serious cases are associated to old age, underlying comorbidities (high blood pressure, chronic obstructive pulmonary disease, diabetes), change of the laboratory values (leukopenia, lymphopenia, thrombocytopenia, high levels of C-reactive protein and lactate dehydrogenase, prolonged prothrombin time) and occurrence of complications (pneumonia, acute respiratory failure syndrome, acute respiratory distress syndrome, acute kidney and/or myocardium injury, secondary bacterial or fungal infections, septic shock and multiple organ failure)[5, 6, 8].

In geographical areas where the virus of COVID-19 is disseminated throughout the population in general, a simple algorithm may be adopted, for instance, the triage by rRT-PCR of a simple target of a genetic sequence being enough. One or more negative results do not rule out the possibility of infection. There is a variety of factors which may lead to a false negative result: poor quality of the sample, containing scarce genetic material; collection at a very early stage of the infection; sample badly conditioned after its collection; specific reasons inherent in the technique, such as mutations of the virus or presence of inhibitors of the PCR. If a result is negative and, even so, there is a high suspicion of COVID-19, other samples must be collected and tested. The serological tests may prove useful in the aftermath of outbreaks and also in those cases where the tests by rRT-PCR come back negative but there is a strong epidemiologic connection to COVID-19. The samples collected at the acute stage of the disease and at the recovery stage may confirm the diagnosis (note that the production of immunoglobulins - IgG and IgM - starts days or weeks after the infection with the virus and the immune response depends on several factors, including age, nutritional status, severity of the disease and immunosuppression)[12, 14].

Routes of Contagion

The introduction into the human community occurred via wild animals, but currently the human to human in close proximity transmission path is the predominant one[4, 5, 9].

It still hasn't been established for any respiratory virus the specific degree of infectiousness in terms of the proportion of the several transmission paths. There are multiple individual factors and environmental contexts which might contribute to the importance of each transmission path[15]. Up to date there is no evidence about the causality of the environmental presence of the virus (or viral RNA) and the risk of transmission to humans. This fact is partially related to the ignorance about the dose of infectiousness of the virus. One of this virus' notorious features is the possibility of transmission by asymptomatic carriers (during the virus' incubation period, 2-14 days) or presenting a mild symptomatology[4, 5, 16-18]. The routes of contagion include direct contact with respiratory secretions, ingestion, inhalation of respiratory droplets (>5 μm, cough/ sneeze), aerosols (through clusters of droplets <5 μm generated during the exhalation), fomites or orofecal[6, 17,19-24]. The close contact increases the risk of transmission[5]. The possibility of transmission through aerosols exists, particularly, in enclosed spaces with exposure to high concentrations of aerosols for an extended period of time, something which potentially happens while practicing the profession in the sector of dentistry[20].

Treatment and Vaccine

Currently there are no pharmacological therapies of choice, nor any vaccine for immunization against the infection by SARS-CoV-2[4-6, 9].

The key to the treatment of the pandemic by SARS-CoV-2 is focused on the early diagnosis, isolation and monitoring[8].

The containment measures include the restriction of the movement of persons (confinement to the home space), social distancing, interruption of labor activities in the several sectors, use of masks and frequent hand hygiene when there is social contact[9].

The treatments are oriented towards the support, and include pharmacological therapy, additional oxygenation, non-invasive ventilation, invasive ventilation and extracorporeal membrane oxygenation[5,9]. The first line of intervention is to prescribe antipyretics (paracetamol) and expectorants (guaifenesin). In cases of acute respiratory infection, acute respiratory distress syndrome, hypoxemia and septic shock, the therapy is to administer oxygen [5 L/min], until the values of oxygen saturation in the blood are

higher than 90% (children and adults) or than 92-95% (pregnant women)]. In conditions of acute renal failure, the monitoring of renal function and hydroelectrolytic balance are key. In cases of secondary bacterial and/or fungal infections the prescription of broad spectrum antibiotics is recommended[4].

As far as the vaccination is concerned, doubts remain as to whether the humoral immunity is effective in preventing the contraction of the disease[5].

On 14th April 2020, 389 randomized clinical studies referring to therapy and another 35 regarding vaccination were reported, all of them within the scope of the infection by SARS-CoV-2. However, more thorough studies in methodological terms are necessary to allow for the establishment and implementation of those measures.

Context of the consultation of Dentistry and the need for these Clinical Guidelines

The dentists are, in countless situations, the first line of diagnosis[3]. Moreover, they represent the most exposed professional class and the one at greater risk of infection by SARS-CoV-2 since the majority of the procedures they perform imply the generation of aerosols[9].

The saliva contains a very high viral load of SARS-CoV-2 in infected patients and evidence shows that it can survive up to 9 days on surfaces and items that have come into contact with contaminated oral fluids[5, 9].

The limitation of the sector's activity represents not only a significant economic impact, but it also affects oral health and, subsequently, the general health of the community[9].

The first guidelines made public well into the pandemic restricted the dentists' activity to urgent and immediate consultations referring that, in each case, the solution for the problem should involve the non-generation of aerosols.

In spite of the countless efforts to publish and disseminate the guidelines of post-pandemic intervention, the information concerning SARS-CoV-2 is very volatile and dynamic, wherefore it is the health professionals' duty to keep updated.

It is a challenge to the community, and not only in the context of dentistry, where every measure is oriented towards the prevention and control of the virus' dissemination, their main goal being the protection of each and every one involved in the different

sectors (patients, receptionists, dental assistants, dental prosthetic technicians, dentists, administrative staff)[3, 9].

The need for this paper arises from the inexistence, nationwide, of Clinical Guidelines based on the evidence regarding this problem.

Materials and Methods

Questions

(Appendix II, section 1)

Bibliographic Research

A systematic research of the *MEDLINE* (via *PubMed*), *Cochrane Library* and *Trip Database* databases was conducted, with known technical limitations, during the period ranging between March and April 2020. The search included the following keywords individually and in different combinations (Appendix II, section 2): *"SARS"; "MERS"; "SARS-CoV-2"; "COVID-19 OR Covid-19 OR coronavirus*"; "influenza"; "dentistry"; ["ventilator" AND ("oral hygiene" OR "dentistry)]; [("aerosol*" OR air) AND "SARS"]*. In a second phase we cross-checked the results of the first research with the algorithm created by the *National Institute for Health and Care Excellence* (NICE)[1].

Additionally, we conducted a manual research on websites (*researchgate.net, Dental Blog, Evidentia Medica, thenew.dentist*) e *online* newspapers (*Influenza Journal, ABSA – The Association for Biosafety and Biosecurity, American Society for Microbiology, International Journal of Oral Science, Clinical Infectious Diseases, Nature, The Lancet, JAMA Network, Frontiers of Oral and Maxillofacial Medicine, International Journal of Environmental Research and Public Health, Science, Interface Focus, The Centre for Evidence-Based Medicine, British Microbiology Research Journal, The Chronicle of Higher Education, British Dental Journal*).

In parallel to this, the authors of the included studies were contacted, and the lists of references were reviewed, with the purpose of looking into the publication of more articles within the framework of the Clinical Guidelines.

In spite of the systematic research, the main information stems from the use of guiding documents previously published regarding pandemics already occurred (*SARS-CoV, AH1N1 and MERS-CoV*).

The databases of choice were:

1. Guides of the World Health Organization (WHO) on COVID-19
2. Recommendations of the Portuguese Health Authority (DGS)
3. NICE e SIGN

4. Cochrane collaboration
5. MEDLINE (via PubMed)
6. International and national scientific societies
7. The available evidence, obtained through the search strategy that is reproduced in Appendix II, was simply ranked
    - Priority has been given to systematic reviews and meta-analysis
    - Followed by the search for randomized clinical trials
    - Followed by observational studies
    - Whenever it proved impossible, we searched for publications arising from the observation of experts in previous experiences
    - In those cases where no kind of evidence can be found, the experts who are the authors of these guidelines drew up the recommendations through discussion and consensus based primarily on biological plausibility.

Inclusion/Exclusion Criteria

The following have been defined as inclusion criteria (Appendix II, section 3):

Patients (P): patients infected or not with the virus SARS-CoV-2.

Intervention (I): any type of dental procedure, with or without the generation of aerosols, in a context of pandemic by SARS-CoV-2.

Comparison (C): any type of dental procedure, with or without the generation of aerosols, before the pandemic by SARS-CoV-2.

Outcomes (O): control of SARS-CoV-2 virus transmission; monitoring of patients infected with SARS-CoV-2; prevention measures; disinfection measures; risk of the procedures carried out in dentistry in the contraction of the infection by SARS-CoV-2; training for the health professionals and administrative staff for the new post-pandemic situation; interpersonal contact at times of pandemic by SARS-CoV-2; which personal protective equipment (PPE) to wear, its effectiveness and how to wear it.

The following have been defined as exclusion criteria(Appendix II, section 4):

Criterion A: articles focused on diagnosis (for instance, diagnosis of respiratory changes)

Criterion B: creation of a Clinical Database

Criterion C: vaccination

Criterion D: virus' immune mechanisms/pathogenicity/immunity

Criterion E: other pathologies

Criterion F: triage of opting for hospital treatment/treatment at home

Criterion G: genetic studies/genome

Criterion H: pharmacology

Criterion I: articles written in languages other than Portuguese, English, Spanish and French

Criterion J: others that are not included in the previous ones

Selection and Assessment of Evidence

The research, the triage by title, the abstract and the full analysis of the text of the article were conducted/written by two proofreaders (AV; CM). Any disagreements have been solved through direct confrontation in the form of oral discussion. In situations where an agreement could not be reached, resort was had to a third proofreader (AM).

We have made a summary critical assessment of the literature, but we have not formally assessed the risk of the presence of biases resorting to specific scales.

However, we have always briefly and simply indicated the kind of information underlying the clinical recommendations produced by us.

Ranking of Evidence and Class of Recommendation

The objective of the Clinical Guidelines lies on formulating recommendations based on the evidence which has clinical applicability. The levels of evidence (Appendix II, section 5) rank the different kinds of articles depending on the intrinsic methodology, while the classes of recommendation (Appendix II, section 5) rank the force of the action. In this context, it is expectable that strong recommendations present less frequent variations. The review of scientific evidence allows to gage the ratio risk/benefit of a given action[25].

Research Results

After duplicates have been removed, the research of the databases resulted in a total of 30,276 references, of which 29,976 did not match the inclusion criteria, being consequently ineligible, and were classified as excluded. We obtained the full articles of the 397 potentially eligible references, selected through systematic and manual research.

After the assessment, 212 studies were excluded for the reasons described in Appendix I, section 4.

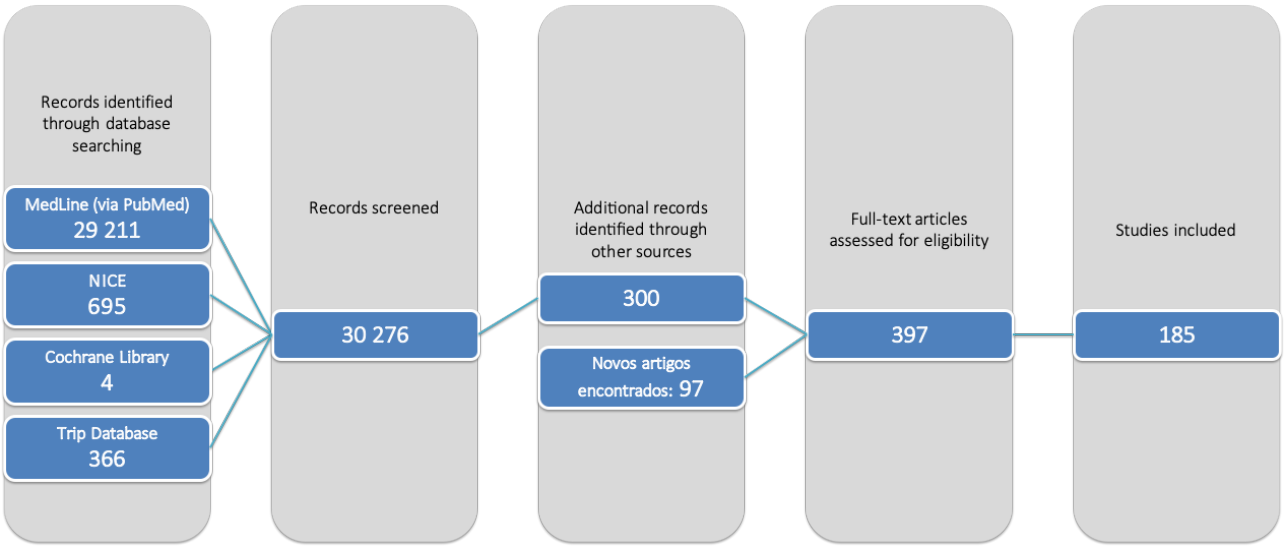


Figure 2 - Result of the Systematic Research.

The Pre-Intervention Stages

The Schedule

The management of the appointments

The dental health care personnel main concern is the protection of the patient as well as of all those involved in the management and operation of the clinic in a safe way, keeping the levels of effectiveness of treatment and meeting the patient's demands.

1.1. How can you manage the schedule?

Answer: Every appointment must have a scheduled time (now more extended, due to the pandemic) suited for every procedure, which must be indicated by the dentist. In case a significant delay is identified, the following patient must be contacted in order to avoid his/her permanence in the waiting room. The appointments must be scheduled with an interval long enough to minimize possible contacts between patients in the waiting room. It must be taken into consideration that the procedures to be carried out in between consultations will take longer so that they can be duly performed (long enough for airing, disinfecting the surfaces, payment logistics and scheduling the following appointment) [26-38]. *(Level IV, Class IIa)*

1.2. Should the patient be alerted to be on time for the appointment?

Answer: Yes, the patient must be right on time for the appointment in order to avoid the gathering of patients in the waiting room. Should the patient arrive in advance, he/she can wait for the time of the appointment near the clinic. In case the patient is late, it is up to the dentist (or the duly trained administrative staff) to decide whether the appointment will be postponed/cancelled[39, 40]. *(Level III, Class IIa)*

1.3. Should the patient be alerted to avoid bringing personal ornaments to the appointment?

Answer: Yes, the patient must be alerted not to wear any personal ornaments like watches, earrings, bracelets, necklaces, rings[39, 41]. One of the main routes of contagion are fomites, in other words, any item or inanimate surface capable of absorbing, retaining and transporting infectious organisms. SARS-CoV-2 has a survival time of up to 24 h on paper, 48 h on steel and 72 h on plastic, therefore the restriction of items unnecessary for the appointment represents the elimination of a transmission path of the virus[9, 42]. *(Level III, Class IIa)*

1.4. Should the patient be alerted to avoid paying the consultation in cash?

Answer: Yes, the patient must be alerted to pay using, preferably, the POS terminal or any other electronic means[39]. *(Level IV, Class IIa)*

1.5. What are you supposed to do if a patient asks for a teleconsultation?

Answer: The option of providing a teleconsultation is the sole responsibility of the doctor and the clinic. Given the specificity of the necessary treatments in most specialties of dentistry requiring the presence and contact with the patient, the decision must be made case-by-case. The digital consultation may be established by electronic mail or video through several digital platforms, through applications for cellphones, among others[43, 44]. *(Level III, Class II)*

Key Points

- The patient must be on time for the appointment, in order to avoid the gathering of patients in the waiting room. ***(Level III, Class IIa)***
- The use of personel ornaments by the patient must be restricted. ***(Level III, Class IIa)***
- The payment of the consuktation must be made using, preferably, a POS terminal or electronic means. ***(Level IV, Class IIa)***
- The option of teleconsultation is the doctor's and clinic's sole responsibility, being assessed case-by-case. ***(Level III, Class II)***

Questionnaire to be completed

2.1. Which questions must be asked while making an appointment by telephone?

Answer: The following questions must be asked:

- Do you have (or have you had) fever over the last 15 days? (temperature ≥38 ºC)
- Do you have (or have you had) cough or trouble breathing over the last 15 days?
- Do you have/experience (or have you had/experienced) a general discomfort, physical fatigue, diarrhea or headaches over the last 15 days?
- Do you complain from (or have you experienced) a sudden loss of smell or taste over the last 15 days?
- Does any of your family members or close contacts suffer from (or has any of them referred) any of those symptoms over the last 15 days?
- Have you been in contact with anyone suspect or having tested positive for COVID-19?
- Have you already been diagnosed with COVID-19? If the answer is affirmative: Are you still in quarantine?

If any of the answers is affirmative, the doctor must be informed about the health condition and weigh up the urgency of the patient's treatment[9, 14, 24, 39, 45-53]. *(Level IIb, Class I)*

2.2. If the patient answers in the affirmative to any of the questions included in the questionnaire referred to in 2.1, but refers absence of fever, how is scheduling supposed to be handled?

Answer: Some patients who have tested positive for SARS-CoV-2 may present cough and other symptoms, but no fever or the temperature rise being at the lower threshold (<38 ºC), particularly in the first days. If the treatment is not urgent, the appointment must be postponed by 2 weeks and the telephone triage must be repeated while confirming the appointment. If it is an urgent situation, you should deal with it as if it were a case of infection with SARS-CoV-2[24, 51]. *(Level III, Class I)*

2.3. While scheduling an appointment for a patient having a professional profile of risk, as is the case of healthcare workers, or hospital environment, day care center or retirement homes employees, should there be any particular care?

Answer: Every mentioned patient, in spite of belonging to a risk group, will be submitted to the same protocol of epidemiologic triage as any other patient and treated according to the standards of individual protection in force for every dental procedure[54]. *(Level IV, Class IIb)*

2.4. The patient refers having been infected with SARS-CoV-2 but he/she have already tested negative since. How is one expected to proceed?

Answer: If the patient has not presented any symptom for, at least, 3 days (fever, cough, fatigue, shortness of breath), has been in home isolation and tested negative for SARS-CoV-2 with a test (rRT-PCR for SARS-CoV-2), that patient is clear to attend the appointment[55-57]. *(Level IV, Class IIa)*

2.5. How should one tackle the situation of a patient having a clinical history of COVID-19 and who is in home isolation?

Answer: A patient undergoing a period of isolation due to COVID-19 in need of urgent dental treatments can only leave the isolation after authorization by the Local Health Delegate. This clearance is the only one allowing the patient to visit the clinic or dental practice and to be treated according to the standards of individual protection in force for every dental procedure[58-61]. *(Level IV, Class IIa)*

2.6. A patient goes spontaneously to the clinic to schedule an appointment without having previously called. What is the receptionist supposed to do?

Answer: It must be explained that going to the clinic without a previous contact must be avoided. After carrying out the epidemiologic triage, the need of an urgent consultation should be assessed[39]. *(Level IV, Class IIa)*

2.7. Should the accompanying person be advised not to come, whenever possible, and/or avoid his/her permanence in any place of the clinic?

Answer: Yes, the presence of the accompanying person is only indicated when the patient is underage, needs help to move around or depends on others[39, 62]. *(Level IV, Class IIa)*

2.8. If the patient comes accompanied, is it necessary for the accompanying person to go through the triage for COVID-19?

Answer: Yes, since this person may be a suspect case[14, 39]. *(Level III, Class I)*

Key Points

- In case of the patient's suspected infection with SARS-CoV-2, the dentist must be informed, as well as weigh up the urgency of the treatment of the patient in question. ***(Level IIb, Class I)***
- The patient who has tested positive for SARS-CoV-2 can come to the dental medicine appointment once she/he has observed the period of quarantine and has had a negative laboratory test. ***(Level IV, Class IIa)***
- In patients positive to SARS-CoV-2 in home isolation, even without fever, every nonurgent dental treatment must be postponed by two weeks, being reassessed afterwards. ***(Level III, Class I)***
- In patients positive to SARS-CoV-2 in home isolation, the treatment is only ensured in urgent situations and subject to an authorization by the local Health Delegate. ***(Level IV, Class IIa)***
- The patient should avoid going to the clinic without previously contacting the reception. ***(Level IV, Class IIa)***
- The presence of accompanying person is only indicated for patients underage or requiring special needs, namely elderly people, pregnant women, people presenting visible physical or mental limitations. ***(Level IV, Class IIa)***
- The accompanying person must be asked, all the same, the questions related to the screening of infection with SARS-CoV-2. ***(Level III, Class I)***
- Every individual (patients/accompanying people) presenting an acute respiratory condition of cough, fever or dyspnea/respiratory difficulty is considered suspect of infection with SARS-CioV-2. ***(Level III, ClassI)***

Reception, Waiting Room and Sanitary Facilities

Organization of space and furniture

3.1. How can you make means of disinfection and protection available to those entering the clinic?

Answer: Install alcohol-based antiseptic solution (ABAS) dispensers near the entrance of the clinic and require its use (through an infographic). Make shoe covers, bouffant cap (optional) and surgical masks available to those who are going to remain inside the clinic[9, 14, 63]. *(Level III, Class I)*

3.2. Which special measures must be applied in this costumer service area?

Answer: Allocate a pen to each employee and another one for the exclusive use of the patients (which must be disinfected after every single use, using either a wipe or disinfectant spray). In case of coming into contact with items belonging to the patient or with potentially contaminated surfaces (cards, bills, coins, cell phone, among others), you should perform the antisepsis of the hands[39, 62, 64, 65]. *(Level IV, Class IIa)*

3.3. How should you organize the waiting room?

Answer: The waiting room must be organized in such a way that the available seats are two meters apart from one another in order to guarantee social distancing. If every occupant wears a mask, the distance may be shorter, making sure that there is no physical contact between them(Centre of Disease Control (CDC). 2020). The patient must wait seated until his/her turn comes. In case the patients prefer so, or when the waiting room cannot accommodate any more users, they must be advised to wait inside their vehicles or nearby (ensuring social distancing), being contacted by phone when it is their turn[56, 67]. *(Level III, Class I)*

3.4. How many people can remain in the waiting room? What is the advised capacity?

Answer: One must make sure that the place where users are to wait only accommodates 1/3 of its usual capacity[63, 67]. One must expedite procedures so that the least possible number of people seat in the waiting room and during the shortest time possible[56, 63]. *(Level IV, Class IIb)*

3.5. Which furniture can there be in the waiting room?

Answer: In the waiting room there must only be the furniture which is strictly necessary to accommodate the patients, one that is easily washable and disinfectable, and a waste container to store the disposables worn by the patients. It is recommended to remove every decorative furniture such as paintings, sofas, support tables, flower boxes, among others[63, 67]. *(Level III, Class I)*

3.6. Should magazines or newspapers be available?

Answer: Preferably, every newspaper, magazine and toy must be removed[67]. *(Level III, Class I)*

3.7. Should the TV and air conditioning remote controls be available?

Answer: No, these must be out of public's reach[65, 68]. *(Level IV, Class IIa)*

3.8. Should the water dispenser or the coffee machine be available?

Answer: No, they must be removed since they may be a source of contagion[39, 68]. *(Level IV, Class IIa)*

3.9. Which changes must be made in the sanitary facilities?

Answer: The towels and hand driers must be replaced by paper towels dispensers. Every non-essential element must be removed[39]. *(Level IV, Class IIa)*

3.10. Which means of decontamination must be available at the sanitary facilities?

Answer: Liquid soap and ABAS must be available[37, 67] . *(Level IV, Class IIa)*

Key Points

- Make alcohol-based antiseptic solution available near the entrance and make surgical masks and shoe covers available to the individuals who are going to remain inside the clinic. ***(Level III, Class I)***
- Each employee has his/her own pen; there is a pen for the exclusive use of the patients, which must be disinfected after every single use. ***(Level IV, Class IIa)***
- Contact with objects belonging to the patient: sanitize the hands with antiseptic solution. ***(Level IV, Class IIa)***
- Do not share the telephone without it being previously disinfected. ***(Level IV, Class IIa)***
- Only the furniture which is strictly necessary must remain in the waiting room. ***(Level III, Class I)***
- The waiting room must allow for social distancing and must not exceed 1/3 of its maximum capacity. ***(Level III, Class I)***
- The TV or air conditioning remote controls must be out of public's reach. ***(Level IV, Class IIa)***
- The water dispensers and coffee machines must be removed since they are a potential source of contagion. ***(Level IV, Class IIa)***
-

Physical Barriers and Signage

4.1. Should there be physical barriers between the reception and the user?

Answer: One must make sure that customer service is provided through physical barriers which limit the proximity between employees and users (for instance, the installation of an acrylic barrier which might limit exposure)[37, 39, 63]. One must make sure that customer service is provided while keeping an appropriate distance of, at least, 1 m by means of signaling to this effect - namely through signage and markings on the floor (Level IV, Class IIa)

4.2. Which signposting can indicate the organization of the waiting spaces or the interdiction of crossing without permission?

Answer: Signage and/or markings on the floor delimiting the safety area around the reception desk of, at least, 1 m must be used. Visible notices at the entrance and on the counter raising awareness about the distancing[63, 69]. *(Level III, Class IIa)*

4.3 Which informative billboards on COVID-19 must be posted and where?

Answer: Some infographics explaining the hand washing[38, 63, 69] must be posted near the ABAS dispensers, in the waiting room, at the reception and in the sanitary facilities. Infographics explaining the respiratory etiquette[38, 39, 63, 67] must be posted at the entrance of the facilities, in the waiting room, in the sanitary facilities and at the reception. At the entrance of the facilities, there must also be available infographics explaining how to put on and remove a surgical mask. *(Level IV, Class IIa)*

Key Points

- The safety distances and expected conduct of patients and staff must be properly posted at the clinic's entrance and on the counter. ***(Level III, Class IIa)***
- The customer service must be provided while keeping a distance of, at least, 1 m, alongside with the implementation and application of physical barriers. ***(Level IV, Class IIa)***
- Information about respiratory etiquette, hand sanitization and donning/removal of the mask must be posted. ***(Level IV, Class IIa)***

5.1. What is the rationale behind hand washing?

Answer: Hand hygiene has been considered the most effective, simplest and cheapest single measure to reduce the risk of cross infection of microorganisms[38]. The virus may persist on several types of surface from hours to days, depending on the type of material and the environmental conditions (temperature and humidity), which implies the importance of a thorough disinfection of surfaces in a dental clinic/practice and dissemination of routine practices of hand hygiene and asepsis, both on the part of the health professionals and of the administrative staff and users[14, 69]. It is fundamental to establish a protocol of adherence to these hygiene standards because they are recurrently neglected by the health professionals, as reports a systematic review referring adherence rates lower than 20%[70]. Another systematic review has determined the effectiveness of physical interventions in containing the contagion of respiratory viruses[71]. 32 studies were included regarding the topic of hand washing (12 RCT and 16 of observational nature), in several environments like health units, schools, day care centers, military conscription centers, fraternities/sororities and households. The highest methodological quality RCTs have determined a high effectiveness of hand washing in the prevention of contagion of respiratory viruses, especially in children. We can infer from the meta-analysis derived from the studies of checking cases that the implementation of simple and cheap hygienic measures is effective in the containment of SARS-CoV. The review concludes that frequent hand washing, with or without the adjuvant use of antiseptics, is effective in the reduction of viral transmission and that it must, preferably, be combined with other interventions of containment, such as the use of protective equipment and the triage of suspect cases. The public sanitary measures seem to be highly effective, especially if they are part of a structured program which includes simultaneous information and education. In the future, it will be of the essence to fill in some gaps displayed by the evidence through broad pragmatic trials, in order to assess the best combinations of sanitary and hygienic measures both in the community and in a private and hospital clinical setting, regarding several respiratory viral agents, focusing on SARS-CoV-2.

Hand hygiene has been considered the most important single measure to prevent the transmission of microorganisms. However, in order to optimize its effectiveness, this measure must be included in a general protocol of asepsis and spread through an

educational program of promotion of enabling habits and practices, both through training actions destined for health professionals, diffusion through information leaflets (or others considered suitable) and motivational reinforcement for the users, as well as through the implementation of physical devices integrated in the premises of dental clinics. *(Level Ia, Class I)*

5.2. Which products must be used to sanitize the hands?

Answer: It is recommended the use of the technique described by the WHO, following their recommendations for the 5 moments of hand hygiene. The leaflet and/or billboard explaining the hand washing must be posted near the areas provided for that purpose, namely sanitary facilities and dental office[63, 69, 72]. The antisepsis of the hands is a prerequisite for the dental practice; however, besides the health professionals at the clinic, it must eventually be extended to the administrative staff and users. The practice of the proper hand hygiene must be reinforced and carried out in an attentive and conscious way. The technique described by the WHO implies 6 chronologically chain-linked steps for the hand washing (40 to 60 s) or antiseptic friction of the hands (20-30 s): washing the palm of the hands – back with fingers interwoven – palm with fingers interwoven – fingers – thumbs – pulp of fingers. The health professionals in a clinic should adhere to the WHO's recommendations called "My 5 moments of hand hygiene": before touching a patient, before the cleaning or aseptic procedures, after risk or exposure to body fluids, after touching a patient and after touching around the patient[73]. *(Level Ib, Class I)* (Appendix III, section 1)

5.3. Which products must be used to sanitize the hands?

Answer: Hand hygiene with ABAS is universally used as the most effective, simplest, safest and cheapest procedure to fight the transmission of COVID-19. When hands are dirty or visibly contaminated with protein matter or blood, you must use, alternatively, water and soap. In the WHO's guidelines on hand hygiene in health care[73], they develop an extensive narrative review about the effectiveness and efficiency of the several preparations for this purpose, through several experimental studies (in vitro and in vivo assays and clinical studies). It is established that ABAS is the preparation of choice for a routine antisepsis of the hands, with the highest level of evidence (Ia). Through the

denaturation of proteins, the alcohol inactivates the virus with envelope (lipophilic), including the coronaviruses, and it is effective with a concentration of ethanol of, at least, 60%. In a systematic review about the effectiveness of ABAS, it was concluded that it removes microorganisms in a more effective way, in less time and with a lower irritant capacity than washing the hands with water and soap or other antiseptic agents[74]. ABAS' formulations containing 80% (v/v) of ethanol or 75% (v/v) of isopropanol are virucidal for SARS-CoV and MERS-Cov[73]. In a clinical context, it is fundamental to comply with the recommended washing time and volume of product in order to achieve a real effectiveness. The product's ideal volume to be applied is still not totally defined and may vary depending on the formulations. However, as a general rule, if you experience a sensation of dry hands after washing them during 10-15 s, it is likely that you have applied an insufficient quantity of product. Nonetheless, alcohols are not good cleaning agents and their use is not recommended when hands are dirty or visibly contaminated with organic matter or blood. Under the circumstances, you must use water and soap, whose effectiveness is well established with a high level of evidence[38, 73, 75, 76].

As a future recommendation for research, we must implement new adaptations to the experimental methodology of the antimicrobials for the asepsis of the hands. Besides the in vivo laboratory assays of effectiveness, it is key to conduct effectiveness testing that can be extrapolated to real-life conditions of application in a clinical setting. *(Level Ia and Ib, Class I)*

5.4. Which are the methods that keep hands' skin healthy?

Answer: In spite of the high clinical safety of ABAS' formulations, their frequent use for the antisepsis of the hands may cause skin dehydration. There are several strategies intended to minimize skin irritation or dermatitis: selecting products which are not as irritant, avoiding noxious practices and using skin care moisturizing products. It is estimated that the hands' occupational dermatitis may affect 30% of the health professionals. However, the shift towards a routine use of ABAS' formulations improves these professionals' skin health if some care is applied[64, 77]. Several clinical studies have shown that the use of moisturizers or other conditioning agents, such as ABAS's excipients, is associated to a lower skin irritation compared to simple or antimicrobial soap. The addition of 1-3% of glycerol may minimize this side effect. You must also avoid noxious practices, like washing regularly your hands with water and soap immediately before or after using

ABAS, as well as put on gloves while your hands are still wet after washing them, regardless of the product that has been used. Health professionals at risk of developing contact dermatitis might benefit from the complementary use of emollient or moisturizing creams[73]. *(Level Ib, Class I)*

5.5. Should the patients be allowed to brush their teeth, prostheses or removable braces before stepping inside the consultation office?

Answer: That must not be allowed, in order to avoid cross contamination, being recommended the existence of some information concerning this prohibition in the sanitary facilities[67] . *(Level IV, Class IIa)*

Key Points

- Hand hygiene using alcohol-based antiseptic solutions (ABAS) is used worldwide as the most effective, simplest, safest and cheapest procedure at fighting the transmission of COVID-19. When hands are dirty or visibly contaminated, you must use water and soap. ***(Level Ia and Ib, Class I)***
- We recommend the use of the technique described by the WHO, following their recommendations for the 5 moments of hand hygiene. ***(Level Ib, Class I)***
- Patients must not brush their teeth nor sanitize prostheses or removable braces in the clinic's sanitary facilities. ***(Level IV, Class IIa)***

Cleaning the Waiting Room and the Sanitary Facilities

6.1. How often should you clean?

Answer: The facilities must be cleaned and disinfected, at least, once a day, using appropriate agents, in every customer service area, waiting room and corridors leading to the consultation offices. The spaces where children might be must be cleaned more often[78, 79]. (Level IV, Class IIb)

6.2. How should you clean surfaces?

Answer: The cleaning must always be wet - do not use dry vacuum cleaners in public areas, unless they are equipped with a tank which collects the dirt in the water; this reservoir must be emptied and washed after every single use[62, 68, 78]. *(Level IV, Class IIb)*

6.3. How should you do this cleaning?

Answer: It must always be done from top to bottom and from the cleanest areas to the dirtiest ones[68, 78]: *(Level IV, Class IIb)*

1. Walls (where indicated);
2. Equipment existing in the areas;
3. Surfaces above the floor (working benches, tables, chairs, handrails and others);
4. Washbasins;
5. Floor.

6.4. Which cleaning/disinfection products must be used?

Answer: The cleaning products must contain disinfectants certified for use in a hospital/ clinical setting and comply with EN 14476 for virucidal products, and they must be applied according to the manufacturer's instructions.

As an option for those less critical surfaces, bleach-based products (sodium hypochlorite) having, at least, 0,1% of free chlorine may be used; in practice, it equals 20,5 ml of common bleach (5%) for every liter of water, which must not be prepared until they are

about to be used. It is important to leave the bleach for 10 min, rinsing it afterwards[65, 78]. (Level IV, Class IIb)

6.5. What are the most critical surfaces?

Answer: The most critical surfaces are keyboards, mouse, POS terminal, door handles, the reception counter, hand rails and disinfectant dispensers[65]. (Level IV, Class IIb)

6.6. How often should the most critical areas or surfaces be cleaned?

Answer: The cleaning frequency of the surfaces which are frequently touched must be, at least, once an hour or after every single use[80]. *(Level IV, Class IIa)*

6.7. What are the materials you must use while cleaning the most critical areas?

Answer: The cleaning cloths must be, preferably, of single use and disposable, or wipes moistened with disinfectant and supplied by their own dispenser.

Use a wipe for every surface and then throw it away; do not dry the surface out after using the disinfectant wipe because you need that one to be wet for some minutes until it dries in the air in order to be effective[68, 78]. *(Level IV, Class IIa)*

6.8. How often must you clean the sanitary facilities?

Answer: Draw up a cleaning and sanitizing plan for the facilities, which must be posted in a visible place. This must be done, at least, 3 times a day, or whenever it proves necessary[78, 79]. *(Level IV, Class IIa)*

6.9. How should you clean the sanitary facilities?

Answer: While cleaning the sanitary facilities, the sequence below must be followed[68, 78]: *(Level IV, Class IIa)*

1. Clean the walls (where indicated);
2. Start the cleaning with the basins (first the taps and only then the basin) and the surfaces around these;
3. Clean the toilets focusing on the internal cleaning, leaving the product for 5 min, scrub with a brush and activate the flush with the brush still inside, so this one might be cleaned as well. In addition, disinfect properly the flush button;
4. Clean the floor;
5. At the end, disinfect the taps and the doorknobs of the restrooms once again.

6.10. Which are the most critical surfaces in the sanitary facilities?

Answer: In the sanitary facilities, the most frequently touched surfaces are the dispensers (both of hand paper towels and of soap or disinfectant solution), taps, door handles, basins and toilet[78, 81]. *(Level IV, Class IIa)*

6.11. Which products must be used to clean the sanitary facilities?

Answer: For the critical surfaces, certified medical-hospital products (EN14476) must be used; for the remaining surfaces, the most widely used detergents are the common ones or the ones for domestic use:

- 70 % ethyl alcohol solution;
- Sodium hypochlorite containing, at least, 5% of free chlorine in its original form diluted in water.

The solution of diluted bleach must have a concentration of sodium hypochlorite of, at least, 0.1%. In practice, it equals 20.5 ml of common bleach for every liter of water, and it must not be prepared until it is about to be used. One must leave the sodium hypochlorite solution for 10 min, rinsing afterwards[68, 78, 81]. *(Level IV, Class IIa)*

6.12. What are the materials that you must use to clean the sanitary facilities?

Answer: Preferably disposable cloths or, as an option, define different colors for the cleaning of distinct areas, namely the basin and the outer side of the toilet.

The inner side of the toilet must be scrubbed with its own brush and disinfectant-based detergent.

The floor must be washed, preferably, with a product containing, in its composition, detergent and disinfectant since it is easier to apply and has a higher disinfecting power[78]. *(Level IV, Class IIa)*

Key Points

- Critical surfaces must be disinfected, at least, once an hour or after every single use. The areas where children might be must be disinfected several times a day. ***(Level IV, Class IIa)***
- The cleaning of critical surfaces must be accomplished using specific products (EN14476), alcohol solution at 70% or sodium hypochlorite solution-based products at 0,1%. ***(Level IV, Class IIa)***
- The cleaning of the common areas, as well as of the sanitary facilities, must be accomplished using sodium hypochlorite solution at 0,1% (or equivalent), and starting from the least dirty to the dirtiest ones. ***(Level IV, Class IIb)***

People flow

7.1. How can the receptionist keep a social distancing, minimizing the fear that this measure might arouse on the patient?

Answer: The receptionist must seek, while keeping customer service cordial, to be as quick as possible, in order to minimize the patient dwell time in the clinic's common areas. Avoid physical contact with the patient and make sure that there is a physical barrier in place keeping receptionist and patient apart - protective acrylic glass (even if partial) with a restricted area (a window) for handing in documents/POS terminal/money. In case there is more than one patient waiting to be served, something which must be avoided, a safety distance of 2 m must be kept between patients. Everyone must wear a mask and avoid physical contact. Request the patient not to touch the counter, door knobs and support areas[14, 63, 82]. *(Level IV, Class I)*

7.2. What should you do after finishing serving a patient/accompanying person and before serving the following one?

Answer: One must sequentially apply surface disinfectant on the counter in between two patients; perform the antisepsis of the hands using ABAS; make sure that the reception area is aired out at all times[83]. *(Level IV, Class IIa)*

7.3. Should there be separate entrances for users and professionals?

Answer: It has not been established. Where possible, one should choose to make the admission to the practice avoiding that staff and users, as well as waiting users and those on their way out cross paths[14, 84, 85]. *(Level IV, Class IIb)*

7.4. What is the minimum mandatory recommendation of personal protective equipment at the dental clinic?

Answer: The transmission of SARS-CoV-2 occurs by inhalation-ingestion-direct contact of the mucous membranes with the saliva droplets. Since this virus can survive on different surfaces for several days, the objects and the hands are possible sources of

contamination. The protective equipment inside the clinic must be determined according to the area where the professional works and the activity/procedure the dentist is going to perform, knowing that the basics includes uniform or disposable gown, dedicated shoes or shoe covers and surgical mask[9, 14, 41, 47, 52, 84, 86-91]. *(Level IIb, Class I)*

Key Points

- After a patient has been served, some surface disinfectant must be applied at the reception (on the counter) in between two patients and you must make sure that the reception area is properly aired out. ***(Level IV, Class IIa)***
- The minimum PPE inside the clinic must be determined according to the area where the professional works and the activity/procedure that the dentist is going to perform, the uniform or disposable gown, dedicated shoes or shoe covers and surgical mask being the mandatory minimum inside the clinic for everyone. (***Level IIb, Class I)***

Access to the Clinic

Dentists and Staff

8.1. Am I able to go to work?

Answer: If you have a clinical condition compatible with infection with SARS-CoV-2, you should not go to work[24, 46, 56]. You must contact the SNS (NHS' Portuguese counterpart) 24 support line - 808 24 24 24. *(Level III, Class I)*

8.2. I have a relative (who is part of my household) who is sick with COVID-19. Can I go to work?

Answer: No. If you cohabit or have cohabited with someone infected, you must not report to work during the 14 days following your last contact with the one infected; this situation is considered a close contact with a high risk of exposure[24, 40, 46, 92, 93]. *(Level III, Class I)*

8.3. I am pregnant or more than 65 years old, I suffer from related systemic pathologies of higher risk. Can I go to work?

Answer: Yes, but you must take into consideration the risks associated to the practice of the profession. It is suggested that the professionals who fit into the categories indicated below must not be assigned to the provision of care involving a higher degree of risk[56, 94] (presence of chronic medical conditions, including immunosuppression conditions; pregnancy). *(Level III, Class II)*

8.4. How is it possible to control if the staff are infected?

Answer: The measurement and recording of the body temperature must be carried out twice a day. Any other symptom which might be compatible with infection with SARS-CoV-2 must be reported immediately to the clinical director. Should there be a suspicion, the evolution of the case must be monitored by the clinical director[14, 40, 46, 56]. *(Level III, Class IIa)*

Key Points

- If you have a clinical condition of symptomatology compatible with infection with SARS-CoV-2, you must not go to work. ***(Level III, Class I)***
- If you cohabit (or have cohabited) with someone infected with SARS-CoV-2, you are considered a close contact having a high risk of exposure and should, therefore, remain 14 days in prophylactic isolation, after the last contact. ***(Level III, Class I)***
- It is suggested that the professionals who fit into the categories indicated below mus not be assigned to the provision of care involving a higher degree of risk (presence of chronic medical conditions, including immunosuppression conditions; pregnancy). ***(Level III, Class II)***

Patients and Accompanying People

9.1. What shall be checked as soon as the patient enters the clinic?

Answer: The patient's temperature must be measured, ideally with a contactless thermometer. Next, administer the epidemiologic questionnaire in order to identify the patients at risk of transmitting an infection by SARS-CoV-2[9, 14, 24, 40, 47, 52, 56, 95]. *(Level IIb, Class I)*

9.2. The patient is feverish or reports having had fever and cough or sore throat and muscular pains over the last 24h. What should you do?

Answer: If it is not an urgent treatment: ask the patient to return home and to contact *Saúde 24* (telephone health advice line). The appointment must be postponed by 2 weeks, always respecting the period of quarantine, and the phone triage must be repeated while confirming the next appointment. In case of emergency, you must consider this patient as a risk patient, who must wait his/her appointment outside or who skips directly to the office, after putting on the appropriate PPE, without remaining in the waiting room[46, 56]. *(Level III, Class I)*

9.3. The patient is not feverish. What should you do next?

Answer: A surgical mask, a bouffant cap (optional) and shoe covers must be supplied to every patient, whether he/she displays respiratory symptoms or fever or not, upon his/he entrance in the clinic. The way how to put on and remove the mask must be taught/ checked. Start by putting the shoe covers on. Before putting the mask on, the patient must be required/taught how to sanitize his/her hands with ABAS[19, 24, 49, 71, 95-98]. *(Level IIb, Class I)*

9.4. Can the patient come accompanied?

Answer: The patient must be advised to come alone, as far as possible, the exception being those patients underage or requiring special needs, such as elderly people,

pregnant women and people displaying visible physical or mental limitations.[56, 82]. *(Level IV, Class IIa)*

9.5. Should the accompanying person wear a mask too?

Answer: Yes, the accompanying person must sanitize his/her hands with ABAS, put a surgical mask and shoe covers on[14, 19, 49, 71, 88]. He/She will have to be submitted to the same triage and to the same procedures of protection than the patient[56]. *(Level IIb, Class IIa)*

9.6. In case the accompanying person walks into the clinical office, where should he/she remain and how should you proceed?

Answer: The accompanying person must not be present at the clinical office. In exceptional situations, this person may remain seated 2 m away from the dental equipment, with a surgical mask and shoe covers on[83]. *(Level IV, Class IIa)*

9.7. In case the accompanying person does not enter the clinical office, where should he/she wait?

Answer: The accompanying person must, ideally, wait outside the clinic or in the waiting room, in case its capacity so allows[56, 83]. *(Level IV, Class IIa)*

9.8. What should you do with the patient's belongings (and the accompanying person's as well, if he/she happens to walk into the consultation office) before putting on the appropriate PPE?

Answer: The patient's belongings must be put inside a clean plastic bag, which must be available at the entrance, and they must be carried around by the patient during his/her stay at the clinic. These belongings will remain inside the bag until the patient leaves the facilities. *(Level IV, Class IIb)*

Key Points

- Upon arrival to the clinic, some procedures involving the patient and the accompanying person must be carried out (if applicable):
  - Patients must be told to sanitize their hands, to put a surgical mask and the shoe covers on. ***(Level IIb, Class I)***
  - Temperature check and administration of the COVID-19 questionnaire. ***(Level IIb, Class I)***
  - In case the patient has fever and has presented suspect symptoms over the last 24 h, he/she must return home, if the appointment has not an urgent nature, and contact Saúde 24. ***(Level III, Class I)***
- The accompanying person must not walk into the clinical office. ***(Level IV, Class IIa)***
- The patient's belongings must be kept in a clean bag made available at the reception. ***(Level IV, Class IIa)***

Maintenance Technicians

10.1. How should maintenance technicians be welcome?

Answer: The technician must avoid direct contact with the clinic's employees and respect the signing delimiting the safety distance. The measurement of body temperature must be performed using a contactless thermometer. The circulation of technicians must be restricted to those areas which their intervention strictly requires. Upon accessing the premises, they must be told to disinfect their hands with ABAS, and put the surgical mask and the shoe covers on[40, 46, 63]. *(Level III, Class I)*

Delivery men

11.1. How should delivery men be welcome?

Answer: These must not go any further than the clinic's entrance and avoid direct contact with the clinic's employees, as well as respect the signaling delimiting the safety distance. The parcels must be dropped off and remain at the entrance, being stored afterwards by a clinic employee after their disinfection with spray or a wipe containing alcohol at 70%. The employee must sanitize his/her hands with ABAS[63, 99]. *(Level IV, Class IIa)*

Waste Collectors

12.1. How should waste collection employees be welcome?

Answer: The responsible for the collection must avoid direct contact with the clinic employees and respect the signaling delimiting the safety distance. He/She must restrict circulation to those areas which his/her intervention strictly requires. The professionals in charge of the transport of hospital waste should wear the appropriate PPE and follow the rules determined by the respective Services of Health and Safety at Work/Occupational Health. Outside the packages/packaging containers for transport of waste, particularly in the lock area/lid and in the handle area, you must apply a disinfectant solution of sodium hypochlorite containing, at least, 1% of chlorine[100]. *(Level IIb, Class I)*

Key Points

- Maintenance technicians:
  - Avoid direct contact with the clinic staff; respect the safety distances; restriction of circulation to the intervention areas; briefing for the hand hygiene, put a surgical mask and shoe covers on. ***(Level III, Class I)***
- Parcel delivery men:
  - Do not cross the entrance of the clinic; avoid direct contact with the clinic staff; respect the safety distances; the parcels must be disinfected. ***(Level IV, Class IIa)***
- Waste collection employees:
  - Avoid direct contact with the clinic staff; respect the safety distances; restriction of circulation to the intervention areas; disinfection of the lock area and container handles ***(Level IIb, Class I)***

Means of Protection

Reception/administrative staff

13.1. What is the appropriate protective equipment?

Answer: The reception staff must:

- Wear clothes for exclusive use at the clinic;
- Washable dedicated shoes (for exclusive use at the clinic) or disposable shoe covers;
- Bouffant cap (optional, which must cover the entire hair);
- Eye protection or face shield in case social distancing is not guaranteed at all times;
- Surgical mask, which must be replaced if it is wet or, at most, after 6 h of use[84, 88]. *(Level IV, Class I)*

Hands must be sanitized before putting the PPE on. In parallel, the eye protection or face shield must be disinfected[39, 63, 85, 86, 101]. *(Level IIb, Class IIa)*

Cleaning Staff

14.1. What is the appropriate protective equipment?

Answer: Clothes for exclusive use at the clinic, including waterproof shoes, bouffant cap, surgical mask, apron and thick disposable gloves[84]. *(Level IV, Class I)*

Key Points

- Receptionists and administrative staff must wear the clinic's own clothing, dedicated shoes or shoe covers, bouffant cap, eye or facial protection and surgical mask. ***(Level IV, Class I)***
- The cleaning staff must wear the clinic's own clothing, dedicated shoes, surgical mask, bouffant cap, apron and thick disposable gloves. ***(Level IV, Class I)***
- Other people coming from outside must wear a surgical mask and shoe covers. ***(Level IV, Class I)***

The Stages of Peri-Intervention or Peri-Intervention Stages?

Definition of Risk of the Procedure

15.1. Should risk areas be identified or marked at the clinic?

Answer: The limitation of transmission in a practice/clinic requires a set of preventive and control measures assigned ~~of~~ hierarchically. Setting up physical barriers and specific circuits/flows for patients and professionals allows to minimize contact and exposure. The movement must follow the principle of “three areas and two hallways” - contaminated, potentially contaminated and clean areas - with a buffer area in between the contaminated and the potentially contaminated areas.

There is no need to identify risk areas; however, internally, the definition of areas presenting a risk of differentiated contagion must be present among all the staff members. We can conceptually define the following areas[14, 37, 84, 85, 102]:*(Level IV, Class IIb)*

- **Green or low risk area:** safe and rest area;
- **Yellow or medium risk area:** area designed for the passage and sterilization of materials;
- **Red or high-risk area:** treatment area.

15.2. What are the differentiated recommendations for the different risk areas?

Answer: The control of exposure to the source of contamination by installing physical barriers or ventilation, and decontamination of the environment allows to reduce the risk of contamination. In different risk areas, only those professionals designated to that ~~veryvery~~ area are allowed, and according to an activity plan and the procedures to be performed, reducing the number of professionals in that area and their entrances/exits. The full and appropriate use of the PPE by the professionals, including protective respiratory equipment, protects physically the professionals themselves and the patients from contagion. The use of breathable materials does not lead to further contamination

and allows for a more comfortable use, which leads to a greater compliance with the usage requirements. The direct instructions, active training and video screening showing the correct donning and doffing are important to improve the effectiveness of the use of the PPE[14, 37, 84, 85, 102-106]. *(Level III, Class I)*

- **Green area**: basic equipment (uniform or disposable gown, surgical mask and/ or social distancing; shoe covers);
- **Yellow area:** degree 1 protection PPE;
- **Red area:** degree 2 and 3 protection PPE.

(read how to put on PPE - Appendix III, section 2)

15.3. How should the general procedures in a clinic be ranked in terms of risk?

Answer: At the dental clinics there are several levels of equipment to be worn according to the risk to which one is exposed. Considering every patient as a potentially infected individual, the risk of contagion must be considered real and you must not underrate it. The risk is defined by the proximity of exposure as a result of the kind of tasks one performs and by the recurrence of the exposure. We can consider the following levels of risk of the procedure:

- Low risk: sporadic contact with people, considering that social distance is kept and that there is no contact with potentially infected people;
- Moderate risk: constant interaction with people, having, however, the possibility of keeping safety distancing, adopting a respiratory etiquette and wearing masks;
- High risk: frequent and close contact with patients (the distance from them being less than 1 m), but without performing aerosol-generating procedures;
- Very high risk: frequent and close contact with patients (the distance from them being less than 1 m), but with aerosol generation[37, 66, 84, 107].

At the clinic, the administrative and secretariat staff may present a moderate or low risk, however, assistants, hygienists and doctors present a high or very high risk of exposure[37, 102, 108]. *(Level IV, Class I)*

15.4. How should the different clinical procedures be ranked in terms of risk?

Answer: The risk of the procedure is defined by how closely to the patient it is performed and the need to adopt aerosol-generating measures.

Every procedure involving the generation of aerosols must be ranked as having a very high risk of exposure[31, 34, 40, 56, 84, 85, 102, 104, 109-114]. *(Level III, Class I)*

The clinical procedures may be ranked according to the following levels of exposure:

- Moderate risk - procedures which might be carried out at a minimum distance of 1 m, namely clinical history, extraoral X-rays and extraoral photographs. A PPE which provides for degree 1 protection must be worn.
- High risk - procedures carried out in close proximity with the patient (the distance being less than 1 m), namely intra or perioral procedures. A degree 2 protection PPE must be worn.
- Very high risk - procedures involving the generation of aerosols. A degree 3 protection PPE must be worn.

Key Points

- We can define 3 areas: green area or safe and rest area (low risk); one yellow area or area designed for the passage and material sterilization (intermediate risk); one red area or treatment area (high risk). ***(Level IV, Class IIb)***
- Green area/low risk: uniform or disposable gown, surgical mask and/or social distancing and shoe covers. ***(Level III, Class I)***
- Yellow area/moderate risk: surgical mask (type IIR), waterproof disposable gown, bouffant cap, dedicated shoes; the use of gloves and goggles (mandatory in procedures of material disinfection and sterilization) may be considered. ***(Level III, Class I)***
- Red area/high or very high risk: FFP2 or FFP3 respirator, waterproof disposable gown, surgical cap or cap with a neck protection, goggles and/or face shield, 1 or 2 pairs of gloves, waterproof disposable boot covers (alternatively hood-equipped coverall, preferably made of breathable fabric, and shoe covers). ***(Level III, Class I)***
- At the clinic, the administrative and secretariat staff may present a low or moderate risk, depending on the facilities; however, assistants, hygienists and doctors present a high or very high risk of exposure. ***(Level IV, Class I)***

Preparing the office and individual protection

The space and the equipment

16.1. What is the stability of the virus in the atmosphere?

Answer: In laboratory experimental conditions, the virus has a half-life and a viability of approximately: 1 h and 3 h in aerosols; 7 h and 72 h on plastic; 6 h and 48 h on stainless steel; 4 h and 24 h on cardboard; 45 min and 4 h on copper[99]. Moreover, the virus may remain viable on clothes for up to 1 day or on the outer lining of surgical masks for up to 7 days. It also presents a varying stability depending on the ambient temperature: up to 14 days at 4 ºC, 7 days at 22 ºC, 1 day at 37 ºC and up to 10 min at 56 ºC([115]. The evidence in natural contexts shows the virus' prolonged environmental persistence in spaces occupied by symptomatic and asymptomatic patients for up to 17 days, as well as a potential of nosocomial infections[116-118]. The SARS-CoV-2 may remain in the air and on some surfaces, like, for instance, clothes, plastic, stainless steel, cardboard and copper, for hours or even days; consequently, the contact with the surfaces and equipment confined to the consultation office must take place while wearing the appropriate PPE, namely respiratory PPE and disposable gloves, knowing that the latter must not come into contact with the face or any other part of the body. *(Level III, Class I)*

16.2. What is the reach of contaminated aerosols released in normal breathing in a closed environment?

Answer: The classical model on the transmission paths of infectious respiratory diseases lies on a predictive model developed in 1930, which served to explain the transmission of tuberculosis and serves as a basis to the recommendations issued by the main international organizations on COVID-19. The current scientific consensus establishes that the transmission via respiratory secretions emitted by an infected individual happens, mostly, through contact and droplets of bigger dimension (>5-10 μm), without significant capacity for propagation within a distance of up to 2 m. Based on the actual knowledge, derived from laboratory experimental simulations, and from data of quantification of aerosols and dynamics of contagion in hospital units, these premises may be simplified and not reflect the reality regarding the potential of transmission of SARS-CoV-2[36]. New

models have shown that cough, sneezes or exhalations are not only formed by mucosalivary droplets with semiballistic trajectories of limited range, but mostly by a multiphase turbulent gaseous cloud which imprisons clusters of droplets, including those of smaller dimension (<5-10 μm), with a potential of aerosolization[119]. This cloud develops in a wet and warm microenvironment, protecting the droplets from a precocious evaporation, and enables their spread up to 7-8 m[120]. Even though there are no studies which directly assess the potential of infectiousness of the aerosols released by patients infected with SARS-CoV-2, the characteristics of the dynamics of formation of the gaseous cloud of exhaled aerosols and their role in the infectious transmission must be considered.

During the inter-human airborne transmission, the cloud of airborne bioaerosols, generated when someone coughs, sneezes or exhales, may reach distances of 7-8 m, which exceeds the considered safe distance (2 m). *(Level III, Class I)*

16.3. Which distance may reach the aerosols generated during the operative procedures in Dentistry?

Answer: Several factors, including humidity, temperature, dimension of the particles, ventilation, instrumental and operatory postures may influence the potential of dissemination and infection of aerosols contaminated by biological agents. Regarding non-surgical dental procedures, the (sonic and ultrasonic) scaling is the one which has the highest incidence of aerosol spreading, followed by high rotation instruments, polishing by sandblasting and air/water syringe. Those aerosol-generating procedures in the conventional environment of a dental office may generate contamination to distances over 1.5 m[31]. The most contaminated areas are number 1 and 2 (0.5 and 1 m around the patient's head, respectively), with an emphasis on the patient's chest (main contamination area), doctor's and assistant's face area, the doctor's right arm and the assistant's left arm, lower neck region, the lamp and its handles, the cutting instruments' support area, the rotary cutting instruments themselves, ultrasounds, and air and water syringe, the doctor's and the assistant's support trays (in case they exist), the terminals and the area where surgical aspirators fit and the spittoon area.

Whenever a well-positioned high flow suction system is associated, the contamination beyond a 60 cm radius is residual[121]. The peak of the aerosol decreases to baseline

levels within 10 to 30 min with a quick dispersion or deposition of particles after the dental procedures(A M Bennett; M R Fulford; J T Walker; D J Bradshaw; M V Martin; P D Marsh 2000). However, the airborne aerosols may potentially reach any area of the office, meaning that there are no "green" areas which might be guaranteed contamination-free. *(Level Ib, Class I)*

16.4. How should dental equipment and the surrounding surfaces be protected?

Answer: Besides the dentist/hygienist and the assistant, the targets which are the most directly contaminated by the aerosols in the consultation office are: the lamp and its respective handles, the spittoon and adjacent areas, the movable support tray, the doctor's operating instruments and their support area, the assistant's support tray (when it is available), the suction terminals and their respective bracket. Besides the external surface, the rotary or ultrasound cutting operating instruments, and the air and water syringe may also be contaminated internally[24, 123-126]. However, the aerosols generated while working in the mouth may potentially contaminate any exposed place or infrastructure existing in the dental office. *(Level Ib, Class I)*

Therefore, we recommend you to:

- Protect the head support, arms, chair, lamp, handles, the doctor's and the assistant's support trays, the spittoon's adjacent area, the surgical aspirators' terminal, the cutting operating instruments, and the air and water syringe with plastic or tin foil barriers;
- Use disposable air and water syringe terminals;
- Use removable and autoclavable lamp handles (when they are available);
- Remove the patient's chair's arm and hand supports (where possible);
- You should only keep on the workbenches the material and equipment required for the procedure in question;
- Only the cutting operating instruments, preparation and the like strictly necessary to the defined procedure must be mounted in the work equipment;
- Protect the movable equipment that sits on your workbench, like LED-curing light, endodontic motors, scanners, photo cameras and others using plastic barriers or tin foil;
- Protect the radiographic films and the sensors of digital imaging with a plastic casing, being then coated with a fingerstall, aiming to reduce the salivary

stimulation triggered by the nuisance caused by the grooves in the casing, as well as to reduce the probability of its rupture;

- Possess a system of inner air renewal so as not to allow or reduce the permanence and "deposition" of aerosols on the several surfaces of the offices.

16.5. How should the disinfection of the several components and infrastructures of the consultation office be carried out?

Answer: Human coronaviruses are inactivated by processes of disinfection which act by oxidation with alcohol-based products, hydrogen peroxide and sodium hypochlorite, or by processes of sterilization by heat, like autoclaving[24, 125, 127]. *(Level Ib, Class I)*

- Every area, equipment, instrument and work material in the dental office must be protected with adapted mechanical barriers, as far as possible, and disinfected following specific protocols. The movable material which meets the conditions for that must be sterilized by autoclaving;
- Concerning human coronaviruses, the disinfection of the inner surfaces, and of non-disposable or non-autoclavable materials and equipment, can be done using ethanol-based products at 70%, hydrogen peroxide at 0.5-1% or sodium hypochlorite at 0.1-0.5%, with a minimum exposure time of 1 min. Other physical and chemical agents with virucidal potential can also be used (ultraviolet radiation, glutaraldehyde);
- Promote a flow of air renewal (natural and forced) in the office with a minimum renewal rate of 6 times per hour (namely during aerosol-generating interventions);
- Promote a good surgical suction (8 mm nozzle or slightly superior, close to the source of emission of the aerosol and capacity of aspirating 2.8 m^3 of air per minute, at least). The use of adaptations with larger nozzles connected to the surgical suction system and placed at the entrance of the oral cavity requires a compensation (increase) of the suction flow in order to keep the effectiveness;
- Once the procedure has been completed, you should disinfect the surgical suction systems using ammoniacal or enzymatic disinfectants mixed with water.

16.6. What is the most suitable ventilation system in a clinical office?

Answer: The dental office's ambient air may become easily changed in chemical, physical and microbiological parameters harmful to human beings. Besides the microbiological contamination, the dental office's inner air has parameters which are important for the assessment of the health conditions and well-being, such as: temperature, relative humidity, levels of carbon dioxide and of volatile organic compounds. The heating, ventilation and air conditioning (HVAC) systems, however necessary, may turn into an outbreak of dissemination of contaminants of the ambient air. Microbiological agents which make their way into the ventilation systems and are redistributed by them may spread outbreaks of potential infection through an entire building.

The flow of forced ventilation may influence the risk of residual contamination by aerosols in the ambient air. However, besides the flow, the rate of renewal by "clean" air, the filtration systems and the ducts' physical location seem to be very important factors in the effectiveness of the HVAC systems.

Whenever there is a high concentration of aerosols, one single air renewal may remove approximately 63% of the aerosols. After 5 renewals, it may remain only 1% of the aerosols. That is to say, at a renewal rate of 10 to 12 per hour, 20 min will be enough for an almost total decontamination. With about 6 renewals per hour, it will take an hour. However, if the exhaust system has already been switched on before the generation of aerosols starts, their saturation will never be total and even at lower renewal rates, it may prove possible to keep fairly low environmental values[26-38]. *(Level Ib, Class I)*

- The dental office must allow for some natural ventilation. Keep a window open where possible and appropriate;
- The natural ventilation must be complemented by a HVAC system which must take some basic assumptions into account:
    - The rate of minimum air renewal must be 6 times as high as the office's total volume per hour, or about 24 m3/hour/person. Whenever there is a high emission of potentially contaminated aerosols, the ideal would be 12 total renewals per hour;
    - It seems consensual that, as far as aerosols are concerned, the installation of the internal exhaust ducts must be carried out at a superior level (near the ceiling);
    - Possess suitable and well-positioned filtering systems;

- Take into consideration the location of the external inlet and exhaust ducts so that they are not too close to one another (a minimum of 5 m, according to the Ordinance 353-A, 2013◊);
- The simple combination of mechanical ventilation (with upper exhaust) with an open window may, by itself, generate a beneficial air flow;
- The most effective ventilation method of all is the following one: the insufflation of cold air at a low speed near the floor and extraction near the ceiling, as part of a displacement-like ventilation strategy, it allows for a unidirectional flow and thermal stratification◊;
- You must make sure that the HVAC systems receive proper technical maintenance on a regular basis.

16.7. Is the use of additional systems of purification of biological contaminants in the air of the clinical office justified?

Answer: As far as the individual protection in environments with a potential microbiological contamination of the inner air is concerned, the measures of mitigation may be implemented at 5 levels: 1 - control of the source of emission (patient); 2 - localized and immediate extraction at the source (suction); 3 - dilution of the pollution load in the internal environment (ventilation systems); 4 - purification of the ambient air; 5 - use of PPE.

There is no robust evidence as to the need of decontaminating the offices' ambient air by forced purification as a way to prevent the transmission of diseases. There are several available systems, starting with ultraviolet radiation devices (fixed and movable), ozone devices, local aspirators with several types of filters and air treatment (HEPA, coal, UVC). The use of UVC (100-280 nm) in the offices may help decontaminate the air since it has a fungicidal, virucidal and bactericidal potential through the destruction of DNA and denaturation of proteins. In spite of the diversity of supply in this regard, there are no studies where these systems are compared as far as their effectiveness and advantage over one another are concerned, in the several conditions (variables) of the dental medicine offices, nor the side effects and hazards inherent in their use. *(Level IV, Class IIb)*

- Due to the absence of benchmark comparative studies duly applied within the scope of dentistry and to the dynamics of market offer at this point, it seems pertinent to advise some caution when it comes to select and apply at once a

system of purification of the ambient air. Until further information is available, you must promote the correct use of HVAC systems, combined with natural ventilation (where possible) and all the hygiene standards outlined for the remaining four levels of intervention.

16.8. What must the acclimatization conditions at the clinical office be?

Answer: The temperature, relative humidity and air renewal may affect not only human health globally, but also the existence and survival of some chemical, physical and microbiological agents inside the dental office, including the levels of carbon dioxide, of volatile organic compounds and of bacteria, viruses and fungi. At the ambient temperature of 21°C, an increase of relative humidity from 30% to 50% more than doubles the survival time of coronaviruses which might be present in the aerosols. However, globally, a relative humidity ranging between 30 and 60% is accepted as good. An increase of ambient temperature to 30-40 °C may reduce the survival time of some coronaviruses. Inversely, the drop of temperature to values of 4 to 6 °C may increase the survival of the coronaviruses[29, 30, 36, 127, 129, 130]. *(Level Ib, Class I)*

- You must promote an inner environment ranging between 21-23 °C (Winter) and 23-25 °C (Summer). The distribution of the temperature in the office must be as uniform as possible, without too fast displacements (flows) of air;
- The relative humidity must be kept at between 30 and 50%. Keeping humidity at the most inferior level (around 30%) may prove beneficial in the reduction of some microorganisms' survival, but may also cause some respiratory discomfort.

16.9. Is it advisable to use means of microbiological decontamination in the water supply systems and water reservoirs of the equipment?

Answer: The water supply systems and water reservoirs of the dental equipment may contain and convey several kinds of microorganisms such as bacteria, fungi, viruses or protozoa. The microorganisms which are present in the water may also contribute to the microbiological load of aerosols and the exposure to them may cause several serious respiratory, eye and dermal pathologies, among others[24, 34, 124, 131-133]. *(Level IIa Class I)*

- Installing systems of physical and/or chemical treatment (ultraviolet, *calvenium*, hypochlorite, povidone-iodine, chlorhexidine) in the devices of water supply and water reservoir of the dental equipment may significantly reduce their microbiological load;
- The use of non-return valves and constant positive pressure may also reduce the microbiological load of the water made available at the cutting terminals (turbine, counter-angle and micromotor);
- Activate the irrigating rotary instruments for 30 s in between patients. Due to the prolonged nocturnal stagnation, the cleaning time in the beginning of the workday must be longer (at least 1 min). After longer inactivation periods, like weekends and holidays, the time to purge the water from the instruments must also be longer;
- Check and replace regularly the filters of the supply water.

16.10. What is the effectiveness of suction systems in the reduction of the generation of aerosols at the source of contamination?

Answer: Depending on their dimensions, positioning and flow of suction, the suction systems may very significantly reduce the amount of aerosols and droplets expelled to the office's environment[24, 31, 134, 135]: *(Level IIa, Class I)*

- Whenever aerosol-generating procedures are used, we recommend the permanent use of an effective and well-positioned surgical suction.
- Even in procedures which are not aerosol-generating, the surgical suction may always be used if you are not using a rubber dam.

16.11. Does the use of antimicrobials in the irrigation system of the ultrasonic devices reduce the risk of contamination during aerosolization?

Answer: The use of antimicrobial irrigating solutions associated to ultrasonic instrumentation must be understood in the actual context concerning two perspectives: effectiveness on the periodontal clinical parameters and effectiveness in the reduction of the viral load of the generated aerosol.

As far as the first one is concerned, a recent systematic review and meta-analysis have determined the effect of the ultrasonic instrumentation combined with antimicrobials on

the clinical parameters of periodontal inflammation[136]. The global results have not detected an added clinical benefit with the use of antimicrobials. A sub-analysis of the data has reported a favorable weak effect for the povidone-iodine (concentrations of 0.5-10%), through a gain of clinical insertion of 0.23 mm, while for chlorhexidine and the essential oils, the considered effect was nil. This is why we do not recommend the use of antimicrobial coadjuvants in the irrigation of ultrasonic instruments from a periodontal clinical efficiency standpoint.

As far as the second item is concerned, two RCT have assessed this intervention in the reduction of contaminated aerosols regarding the bacterial load. Both studies have determined a significant reduction with chlorhexidine compared to distilled water, and one of them highlighted, on top of that, a significant reduction with the use of povidone-iodine compared to distilled water and a superiority of chlorhexidine over povidone-iodine[137, 138]. Due to the lingering doubts about the ineffectiveness of chlorohexidine in SARS-Cov-2, povidone-iodine might become an alternative in order to reduce the viral load of the cloud of aerosols. However, there is no available evidence about the impact of the antimicrobials, like irrigating solutions, in the ultrasonic instruments on viruses. *(Level IV, Class I)*

- The available evidence is robust enough to not advise the use of antimicrobial solutions in the irrigation system of ultrasound devices from the clinical standpoint of periodontal benefit. However, from the microbiological safety standpoint, there might be some benefit, still to be proved, in the use of povidone-iodine in order to reduce the aerosols' viral load. This procedure should be considered based on a cost-benefit analysis case-by-case.

Key Points

- SARS-CoV-2 may remain in the air and on some surfaces, like, for instance, clothes, plastic, stainless steel, cardboard and copper, for hours or even days; consequently, the contact with the surfaces and equipment confined to the office must be done with the due PPE on, namely disposable gloves, knowing that these must not come into contact with the face or any other part of the body. ***(Level III, Class I)***
- The most contaminated areas are number 1 and 2 (0,5 m and 1 m around the patient's head, respectively). ***(Level Ib, Class I)***
- You must promote an inner environment ranging between 21-23 °C (Winter) and 23-25 °C (Summer). / An internal atmosphere ranging between 21-23 °C (Winter) and 23-25 °C (Summer) must be promoted. The distribution of the temperature in the office must be as uniform as possible, without too fast displacements (flows) of air. ***(Level Ib, Class I)***
- The relative humidity must be kept at between 30 and 50%. Keeping humidity at the most inferior level (around 30%) may prove beneficial in the reduction of some microorganisms' survival, but may also cause some respiratory discomfort. ***(Level Ib, Class I)***
- Whenever aerosol-generating procedures are used, we recommend the permanent use of an effective and well-positioned surgical suction. ***(Level IIa Class I)***

Personal Protective Equipment (PPE)

PPE donning

17.1. Must the PPE to be worn be defined by the risk involved in the procedure?

Answer: The risk of the procedure to be performed defines the type of PPE to be worn. However, when it comes to select the PPE, you must consider factors other than its function, like its fitting, how comfortable it is to put on and wear, the possibility of decontamination, being disposable and its cost. The professional must select the combination of elements of the PPE that best fit, given that he/she might have to wear them for long periods and, therefore, they must be as comfortable as possible. As a general rule, the type of PPE must be selected according to the following levels of risk of the procedure[37, 62, 85, 102, 104, 105, 109-111, 114]: *(Level IV, Class I)*

- Low risk - basic equipment (uniform or disposable gown, dedicated shoes or shoe covers and surgical mask);
- Moderate risk - degree 1 protection PPE;
- High risk - degree 2 protection PPE;
- Very high risk - degree 3 protection PPE.

(read donning of the PPE - Appendix III, section 2)

17.2. What is the appropriate PPE according to the levels of protection?

Answer: The selection of the equipment is conditioned by the level of risk and the degree of protection inherent in the procedure to be carried out. Additionally, every equipment must be certified for use in the EU. It is necessary to undergo some training for its donning and, mainly, for its removal, since many of the cases of contamination of the health professionals occur during the removal of the contaminated equipment. *(Level III, Class I)*

The basic equipment must be worn upon entering the clinic after hand hygiene. It must be kept on at all times and only replaced by a better PPE, according to one of the three degrees of strategic occupational protection to be applied at the dental clinics[62, 85, 102, 104, 109-111, 114]: *(Level IV, Class I)*

- **Degree 1**
  - Surgical mask (type IIR);
  - Disposal waterproof gown;
  - Bouffant cap;
  - Dedicated shoes;
  - Observation gloves (latex or nitrile).

- **Degree 2**
  - FFP2 respirator or equivalent;
  - Disposal waterproof gown;
  - Surgical cap (bouffant caps with a neck protection are optional);
  - Eye protection (goggles with lateral protection and/or face shield);
  - Disposable gloves, preferably with a long sleeve;
  - Disposable boot covers.

- **Degree 3**
  - FFP2 or FFP3 respirator;
  - Disposable waterproof gown or coverall;
  - Surgical cap and cap with a neck protection (alternatively, coverall);
  - Eye protection with goggles and face shield;
  - Two sets of disposable gloves;
  - Disposable waterproof boot covers.

17.3. Which type of masks are there? And what is the indication for its clinical use?

Answer: Face masks are medical devices destined to minimize the transmission of infectious agents between professionals and patients. These masks must comply with EN 14683:2019. They are classified in different types (Type I, Type II and Type IIR) according to their capacity of bacterial filtration and resistance to fluids and splatters. Type IIR mask displays a bacterial filtration effectiveness >98% and resistance to fluids >160 KPa, being called surgical mask, while the Anglo-Saxons call it *Fluid Resistant Surgical Mask* (FRSM). Self-filtering masks or respirators are destined to personal protection against one or more risks. They are encompassed by the PPE and comply with EN 149:2001+A1:2019, for

standards of effectiveness of filtration and total leak into the interior of the mask, and are classified as: FFP1 (*Filter Face Piece* 1) of low effectiveness, leak into the interior 22% and infiltration into the material 20%; FFP2 (N95 of US – NIOSH certification) of medium effectiveness, leak into the interior 8% and infiltration into the material 6%; FFP3 (N99 of US – NIOSH certification) of high effectiveness, leak into the interior 2% and infiltration into the material 1%.

Surgical masks must be worn essentially to protect third parties, whereas the valveless respirators allow a bidirectional protection and these must be the ones to be worn by the health professionals. In a context of epidemiologic prevention, the use of respirators equipped with valves is not recommended(,).

The respirators are individual protection devices and are more recommended for use by the health professionals to provide a higher protection in contexts with a higher infective load[86, 91, 102, 108, 109, 111, 140, 141]. (Level IV, Class II)

17.4. What should you do before putting the PPE on?

Answer: Before putting a PPE on[41, 142]: *(Level IV, Class II)*

1. Tie your hair;
2. Remove watch and jewelry to avoid contamination;
3. Drink water before wearing a protective equipment to avoid dehydration;
4. We suggest that you go to the bathroom in order to avoid interruptions;
5. Men must avoid to wear beard, since it affects the mask's marginal sealing;
6. Perform hand washing and hand disinfection.

17.5. How are you supposed to put the PPE on?

Answer: There are different ways of putting the PPE on, but every single one of them aiming to prevent the secondary transmission of diseases. The process of donning must be carried out near the area where it is supposed to be worn, it improves the safety of the whole process when it is carried out with the active assistance of a team member.

Face masks, surgical masks or respirators must be put on and adjusted with your hands properly washed and after putting on the surgical cap.

Every mask must provide for the best sealing possible. For that, it must be well tight and adjusted over the nasal bridge and facial contour in order to prevent the entrance of

contaminated air through the side of the mask or respirators. An adaptation test must be conducted at the end.

You must conduct a qualitative assessment of the adaptation by softly inhaling in order to detect any strong odor. On the other hand, you must check the sealing, first by producing negative pressure, inhaling to create vacuum inside, which is supposed to cause a slight flattening of the respirator's surface if the sealing is effective; immediately thereafter you must conduct the test of positive pressure, blowing moderately to cause the bulging of the respirator's surface in case of sealing[104, 108, 109, 111].

As you enter the clinic, you must put on the first protective "layer", starting with the removal of the ornaments and the hand washing. Next, you put the bouffant cap and the mask on. Then you must assess the procedure to be performed and put the appropriate PPE on: (Level IV, Class I)

- Wash your hands;
- Adapt the respirator and make the adjustment test;
- Put the disposable waterproof gown or the waterproof coverall on;
- Put the foot protection (shoe or boot covers) on;
- Disinfect the hands using ABAS;
- Put on gloves – make sure they are well fitted - over the gown/coverall;
- Put the goggles on, where required;
- Put a surgical cap/bouffant cap or hood of the coverall on;
- Put a face shield protection on, where required;
- Disinfect the inner gloves using ABAS and put the second pair of gloves on, where required degree 3 protection;
- Check the adaptation of every element.

NOTE: The elements of the PPE that you need depend on the level of risk and the adequate degree of protection. Donning a full PPE obeys to a systemization, the dentist being ideally helped by an assistant having previously washed his/her own hands; in order to create surgical conditions of sterilization the assistant must perform the hand disinfection in between two steps[62, 85, 108, 109, 111].

17.6. What care should be taken over the use of PPE?

Answer: You should never touch your face to adjust the mask, the respirator or the goggles without having previously made a careful disinfection of the inner gloves.

The use of a second mask or face shield, in addition to the goggles, is advised since it helps keeping the FFP2 mask and the goggles dry, increasing, however, the respiratory and visual discomfort.

The use of a second pair of gloves reduces the tactile sensibility and makes it harder to perform the procedures; however, it reduces the risk of contamination while removing the degree 3 protection PPE[143]. *(Level III, Class I)*

17.7. What are you supposed to do if the first pair of gloves (inner pair in degree 3 protection PPE) touches a potentially contaminated area?

Answer: You must disinfect the gloves using ABAS[41, 52, 144]. *(Level IV, Class I)*

Key Points

- The selection of the PPE must be made according to the risk of exposure and the degree of protection necessary to the procedure to be performed. ***(Level Ib, Class I)***
- A very careful and ordained donning and doffing of the PPE is required in order to guarantee its protective effectiveness and to avoid that it turns into a focus of cross contamination, respectively. ***(Level III, Class I)***
- Surgical masks must be worn essentially to protect third parties. ***(Level IV, Class II)***
- Valveless respirators allow a bidirectional protection and these must be the ones to be worn by the health professionals. ***(Level IV, Class II)***
- In a context of epidemiologic prevention, the use of respirators equipped with valves is not recommended. ***(Level III, Class IIa)***

18.1. How can you reduce microbiological burden in intraoperative stage?

Answer: Prior mouthrinses with 0.12 or 0.2% chlorhexidine solution, during 1 minute reduce the bacteria amount in the air produced during operative procedures, but they do not seem to be effective with viruses, namely with coronavirus. Mouthrinses with chlorhexidine only acts against free bacteria (such as the ones present in saliva. It does not act against virus or bacteria incorporated into the biofilm, periodontal pockets or nasopharynx.

Coronaviruses are vulnerable to oxidation processes due to chemical agents, such as hydrogen peroxide, alcohol, povidone-iodine and cetylpyridinium chloride[24, 31, 34, 56, 124, 145]. *(Level Ib, Class I)*

- Patients with acute respiratory conditions, cough, a cold, shall not be treated, except in extremely urgent situations;
- Mouthrinsing and gargling with antimicrobial solutions having the ability to oxidize this type of virus (1% hydrogen peroxide, 0.2% povidone-iodine) during 30 to 60 seconds before starting consultation;
- Using efficient suction systems placed next to the mouth or even next to the place where aerosol is generated (specifications already mentioned previously);
- Using natural and/or artificial air renewal systems in the practice, but in a rational manner (specifications already mentioned previously);

18.2. Should a perioral decontamination be performed? How should it be performed?

Answer: On the patient's face, nose surrounding areas (including the upper lip area) and the inner corner of the eyeball concentrate a great variety and amount of microbiological agents. Contact with oral, nasal and ocular areas is a route of contamination and transmission of viruses and bacteria[24, 145-147]. *(Level Ib, Class I)*

- Performing the decontamination of perioral and perinasal areas with ABAS, hydrogen peroxide, povidone-iodine or a solution of chlorhexidine and alcohol.

18.3. What is the importance of using a rubber dam?

Answer: Despite some controversy related to the fact that using a rubber dam may not reduce the aerosol amount, it certainly reduces the production of bio-aerosols and droplets contaminated with blood, saliva and several microbiological agents during the handling of rotary cutting instruments, ultrasonic instruments and saliva and air/water syringe. If the water and air which feed cutting operating instruments are not contaminated with micro-organisms, tooth surfaces to be treated remains as the only potential contamination route of the aerosol which is generated. Wearing a rubber dam reduces the patient's oral breathing, and privileges nasal breathing[24, 31, 34, 148-150]. *(Level Ib, Class I)*

- If it is possible and suitable, use a rubber dam in every procedure;
- Cleaning and decontaminating the teeth which are exposed after placing the rubber dam with sodium hypochlorite, povidone-iodine or hydrogen peroxide;
- Special care removing the rubber dam at the end of the consultation, once due to its elastic properties, contaminated droplets which have adhered to its internal surface which was in contact with the mucous membranes, fluids and teeth may be projected. Using surgical suction during removal prevents aerosol generation and it may also prevent the patient from getting chocked with his/her own saliva.

18.4. Should priority be given to the use of single-dose materials?

Answer: All the consumable materials should be dispensed as strictly necessary, in order to minimize the exposure to aerosols. Caps should always be placed when products are not being used. Wherever possible, packagings should be protected by a physical barrier (e.g.: plastic wrap). There should be a circumscribed and duly respected place on the working table to place these materials. The materials used with one patient should not go back to their storage place before being disinfected after removing the packaging physical barriers. The disinfection of all the vials and other packaging of reusable consumables used during a consultation should be performed with a compressed soaked in sodium hypochlorite or a disinfectant wipe[151]. *(Level IV, Class IIa)*

Key Points

- Patients with acute respiratory conditions should only be treated in extremely urgent situations. ***(Level Ib, Class I)***
- Before the consultation, mouthrinsing and gargling with 1-%% hydrogen peroxide or 02-3.0% povidone iodine solution during 60 seconds. ***(Level Ib, Class I)***
- Using a rubber dam whenever it is possible and suitable. ***(Level Ib, Class I)***
- Consumable materials should have a physical protection to be removed after the end of the consultation, and they should be decontaminated with a suitable disinfectant wipe, alcohol, hydrogen peroxide or a sodium hypochlorite solution after being stored. ***(Level IV, Class IIa)***

19.1. What is the impact of operating instruments on aerosol generation?

Answer: Microbiological contamination derived from aerosols can provide from the patient (oral cavity and respiratory track), the water, the air, the equipment, or even from the instruments and work material. Rotary instruments, ultrasonic devices, air and particle jets and the air/water syringe can generate a great amount of droplets and aerosols containing micro-organisms and fluids, such as saliva, nasopharyngeal secretions or blood. High-flow surgical aspirators can, when correctly applied, significantly reduce the amount of droplets and aerosols released to the office's internal environment. Using ultrasound and rotary cutting systems without water can also generate contaminated aerosols, even though they are not easily visible to the naked eye. Aerosols and aerosolized droplet nuclei can remain in the air for 30 minutes or more after the end of the procedures.

Procedures using ultrasonic or piezoelectric devices are the ones which generate a greater aerosol amount.

Procedures using compressed air propulsion instruments, namely dental preparation with a turbine, but also with a counter-angle, polishing with particle jet, air/water syringe or dental preparation with abrasion, also generate great amount of aerosols.

Thus, we recommend to[24, 31, 34, 104, 124, 152] *(Level Ib, Class I)*

- Use the turbine as little as possible, replacing it with multiplying or 1:1 counter-angles (with adjusted water and air flow);
- Using a rubber dam (whenever it is possible and suitable) and high-flow surgical aspirators at their maximum exhaustion capacity (8 mm nozzle or above and minimum suction capacity of 2.8 m^3 air/minute,
- Practice, whenever possible, handed work;
- If applicable, we recommend that caries lesions removal should be performed using mechanical or chemo-mechanical techniques;
- Reduce active microbiological load in patients' oral cavity by means of suitable elixir before operative procedure (and also during, if applicable);
- Clean, disinfect, lubricate and sterilize cutting and cleaning equipment (turbine, counter-angles, hand-piece, scalers, air and particle jets and similar jets);
- Efficient air renewal in the office;

- Physical and/or chemical decontamination treatment of the water used in dental equipment, in order to reduce the microbiological load which will subsequently integrate bioaerosols;
- Use effective PPE regarding the risk of inhalation and the contact of aerosols and droplets with skin and mucous membranes;
- Inside the office, even after finishing the consultation, professional must keep their mask and goggles and they should only touch the surfaces which were protected and/or were already disinfected.

19.2. Which specifications should cutting/preparation operating instruments have? Are non-return systems better?

Answer: When using rotary cutting operating equipment or ultrasonic surgical equipment, microbiological agents can penetrate into the tubing and cause an inverse contamination of the equipment's air and water systems. *(Level Ib, Class I)*

- After a consultation and before starting the next one, the residues inside the tubes of cutting instruments and similar should be eliminated, running them during 20 to 30 seconds, in order to purge the air/water feeding system.
- We also recommend the use of operative equipment with non-return valves and constant positive pressure in order to reduce the microbiological load of the water available in the terminals and the risk of contamination[24, 34, 124, 132, 133, 153].

Key Points

- Use the turbine as little as possible, replacing it with multiplier or 1:1 counter-angles (with adjusted water and air flow). ***(Level III, Class IIa)***
- Physical and/or chemical decontamination treatment of the water used in dental equipment, in order to reduce the microbiological load which will subsequently integrate bioaerosols. ***(Level III, Class IIa)***
- Use turbines and counter-angles with non-return systems. ***(Level Ib, Class I)***

After-Intervention Stages

End of the Consultation and Disinfection of the Medical Office

Disinfectant Solutions in Appendix III, section 3

20.1. I have finished the operative procedure. What comes next?

Answer: We recommend you to perform subsequently as follows:

- Lift the patient and instruct him/her to mouthrinse and gargle with the antiseptic;
- Ask the patient to empty his glass and place the napkin in it after;
- Perform the antisepsis of the perioral area using a compress soaked in an alcohol solution or 1% hydrogen peroxide or a povidone-iodine solution (dermal solution at 10%, pay attention to pregnant women, children and iodine intolerant patients);
- Instruct the patient to put on the mask and stay sit until he/she is told to leave the office. Except for the perioral areas and the area strictly necessary to perform the procedures, the dentist should never place his/her hands above his/her waist when he/she is wearing PPE, nor touch oneself or the patient[88]. *(Level IV, Class IIa)*

20.2. Which are the critical surfaces?

Answer: Inside the office, the critical surfaces identified are drawer handles, equipment (tips and air/water syringe), imaging sensors, spittoons, lamps, working table (hanging tray, accessory cart and counter), keyboards, mice, door handles, taps, detergent and disinfectant manual dispensers and consumables packing[42, 65, 154]. *(Level III, Class I)*

20.3. How can you minimize contamination and perform the cleaning of critical areas?

Answer: In these areas, disposable waterproof barriers, such as plastic wrap, aluminum foil, plastic sleeves or adhesive covers should be used if possible. After the consultation, these barriers should be removed and discarded, and surfaces should be cleaned and disinfected[40, 75, 78]. *(Level III, Class I)*

20.4. Should protection barriers in screen surfaces, keyboards and mice be removed between patients?

Answer: Yes, all barrier protections should be removed after each consultation, even if they had not been used. In the end of the consultation, surfaces must be disinfected[126]. *(Level IV, Class II)*

20.5. What care should I take with the casing of the digital imaging sensor and the intraoral x-ray films?

Answer: After being used, the protection casing of the digital x-ray sensor, which is disposable, should be discarded in the group III waste container. After being removed from their positioner conventional or phosphor x-ray films must be disinfected (immersed in a solution or cleaned with a wipe) before being placed in the developer or in the reading equipment. In the transition to the developer, films should not be handled with contaminated gloves. Never touch an x-ray film with gloves contaminated with the patient's saliva. If this happens, that film should be disinfected with a compress soaked in 70% alcohol, rubbing both sides of the film for 30 seconds[127]. *(Level IV, Class IIa)*

20.6. How should X-ray positioners be disinfected?

Answer: After the consultation, positioners should be washed with water and detergent, and after that they should be placed in ultrasonic container. Sterilizing procedures should observe the manufacturer's recommendations[123, 126, 151]. *(Level IV, Class IIa)*

20.7. How should digital imaging sensors, intraoral cameras and scanners be protected and disinfected?

Answer: Regarding digital imaging sensors, to ensure the prevention of cross contamination, It is recommend the use of a plastic protection sheath combined with a silicone fingerstall (for example, the finger of a glove), which will increase the insulation guaranteed by the commercialized sheaths. Protection sheaths should cover the camera's handle and/or part of the sensor's handle in order to ensure the protection from the contact with saliva. The disinfection of these devices should be performed with virucidal disinfectant wipes and removable parts should be properly sterilized[26, 73, 123, 126, 151]. *(Level IV, Class IIa)*

20.8. Should the purge of rotary instruments be performed before being removed to be sterilized?

Answer: After the consultation, rotary instruments should be left running for 20-30 seconds, including the instruments with anti-suck-back ability. The use of rotary instruments with no anti-suck-back ability is discouraged. After removing the physical barrier, they should be disconnected from their coupling and placed on the examination tray[24, 75]. *(Level IV, Class IIa)*

20.9. Is chemical external disinfection of turbines, counter-angles and scalers enough against SARS-CoV2 or should they be sterilized between patients?

Answer: No. Cleaning and external disinfection with suitable disinfectants does not reduce the risk of cross infection in instruments which are not equipped with a anti-suck-back system. In addition to the external disinfection of these devices, it is recommended that their sterilization be made between patients[24, 126, 155-157]. *(Level IIIb, Class IIa)*

20.10. What is the sequence for physical barriers and rotary instruments removal?

Answer: Barrier removal should be performed from the least contaminated area towards the most contaminated area. Regarding physical barriers, firstly you should remove the

ones on the handles (lamp, equipment tray, X-ray tubes) and finally the ones on the aspirators, the air/water syringe and rotary instruments; these should be removed to be disinfected in the sterilization area. After the removal of physical barriers and instruments, surfaces must be disinfected with a virucidal wipe[75]. *(Level IV, Class IIa)*

20.11. How should physical barriers to protect the equipment be eliminated?

Answer: Physical barriers must be placed in the group III waste container[126]. *(Level IV, Class II)*

20.12. Regarding surface disinfection (equipment and workbenches), which product is more efficient and for how long should contact time be? be the contact time?

Answer: Surface disinfection can be performed using a disinfectant detergent to achieve a faster procedure, i.e. a product containing compatible detergent and disinfectant (2 in 1). Generally, commercially available products (such as virucidals), duly certified by the relevant authorities should be used. They can have different presentations: liquid, gel, foam or spray. Alternatively, the use of alcohol-based solutions (70%, at least 1 min), hydrogen peroxide (0.5-1% at least 1 min), sodium hypochlorite (0.1.0.5%, at least 10 min) has also been proven as being effective. Metal surfaces which are not compatible with sodium hypochlorite due to the risk of corrosion, should be disinfected with alcohol-based solutions or another suitable product for, at least, 1 min[75, 78, 158, 159]. *(Level III, Class I)*

20.13. Is UV radiation an effective sterilization method?

Answer: UV radiation is effective when combined with surface disinfectants with virucidal properties[160]. *(Level Ia, Class IIa)*

20.14. Regarding wrapping and packaging of the consumables used, which is the most suitable disinfection product and what is its contact time?

Answer: Consumable packaging used during the consultation should be disinfected with a certified virucidal disinfectant or, alternatively, with 0.1% sodium hypochlorite or 70% alcohol, which should be left on the surface for at least 1 min[57, 127]. *(Level III, Class I)*

20.15. Is it necessary to make the suitable aeration of the clinical office before starting the following consultation?

Answer: The aeration of the clinical office is recommended by most authors. However, the time necessary to this aeration depends on the room's volume and on the available ventilation features, among other factors, and it is not fully clarified. Some authors refer natural aeration for, at least, 10 minutes or the implementation of an HVAC system[26-35, 37, 38]. *(Level IV, Class IIa)*

20.16. How often should the clinical office's floor be cleaned and disinfected?

Answer: It should be disinfected, at least, 3 times a day, using suitable cleaning agents and, additionally, whenever contamination with saliva, blood or other type of contaminant has noticeably occurred[40, 75, 78]. *(Level III, Class I)*

20.17. Regarding the clinical office's floor, which product should be used and for how long should it be left in contact to achieve a suitable disinfection?

Answer: Disinfection must be performed using a washing detergent and adding a certified virucidal disinfectant, 0.2% sodium hypochlorite or 0.5% hydrogen peroxide, and it must be left to dry[57, 68, 127, 138]. Floor cleaning should always be performed using a wet method, and avoid the use of vacuum cleaners[57, 127]. *(Level IV, Class I)*

20.18. How should the clinical office cleaning be performed?

Answer: Cleaning should always be performed downwards (from top to bottom) and from the cleanest areas to the dirtiest ones[75, 78]: *(Level IV, Class I)*

1. Walls;
2. Equipment present in the area;
3. Surfaces above the floor (working benches, tables, chairs, others);
4. Sinks;
5. Floor.

20.19. Which cleaning/disinfection products should be used?

Answer: Cleaning products must contain certified disinfectants to be used in hospital/clinic settings and comply with EN 14476, about virucidal products. They must be applied according to the manufacturer's instructions.

As an option, for less critical surfaces, sodium-hypochlorite-based (0.1-0.5%) can be used. The solution must be prepared only at the time it will be used (active for 24 h). It is important to leave the product in contact during 10 min and then rinse it[57, 78]. *(Level IV, Class I)*

20.20. Which types of presentation should cleaning products have?

Answer: Cleaning products can be used as sprays, disposable cleaning cloths or wet wipes in an individual dispenser. Regarding disposable products, a different one should be used for each surface to be cleaned, and it should be left to dry, guaranteeing that the disinfectant is left for the recommended time[57, 78]. *(Level IV, Class I)*

20.21. What is the most suitable disinfectant to be used in the form of wipes?

Answer: Soaked wipes require a short time to take effect (up to 1 min); the most recommended disinfectant is 62-71% ethanol, with 1 min of exposure[127]. *(Level III, Class I)*

20.22. How should surfaces be cleaned in the event they are contaminated with blood or other organic products?

Answer: Should that happen, the spillage should be completely absorbed with absorbent paper, wearing gloves and goggles; after that, a 5% sodium hypochlorite solution (bleach) or a suitable disinfectant should be applied and left for, at least, 10 min; finally, the dirty area should be washed with water and a common detergent, rinsed with water and left to dry in air[57, 78]. *(Level IV, Degree I)*

Key Points

- Performing antisepsis of perioral area with 1 % hydrogen peroxide or a 10 % povidone-iodine solution, and leave the clinical office wearing a mask. ***(Level IV, Class IIa)***
- Protection barriers placed on clinical contact surfaces should always be removed after the end of the consultation. ***(Level IV, Class II)***
- Barriers should be removed from the least potentially contaminated place to the most contaminated one, and subsequently surfaces should be disinfected with an alcohol-based solution. ***(Level IV, Class IIa)***
- X-ray sensors and intraoral films protections, as well as physical barriers removed should be placed in a group III waste container. ***(Level IV, Class IIa)***
- Positioners should be washed and disinfected according to the manufacturer's recommendations. ***(Level IV, Class IIa)***
- Digital imaging sensors, intraoral cameras and scanners require a double protection with a plastic barrier and a silicone fingerstall. ***(Level IV, Class IIa)***
- After each usage, rotatory systems should be activated for 20 to 30 s, and their sterilization between consultations is recommended. ***(Level IIb, Class IIa)***
- The clinical office surfaces should be disinfected with 2 in 1 solutions (detergent and disinfectant). Regarding metal surfaces, alcohol-based solutions should be chosen. ***(Level III, Class I)***
- Consumable packaging should be disinfected with a virucidal product or, alternatively, a 0,1 % sodium hypochlorite or 70% alcohol solution. ***(Level III, Class I)***
- The products used to clean the office should have a certified virucidal action. Cleaning should be performed downwards, from the cleanest areas to the dirtiest ones. ***(Level IV, Class I)***
- The office's floor should be cleaned, at least, 3 times a day. ***(Level III, Class I)***

Materials and devices to be sent to the prosthetics laboratory

21.1. What is the protocol to disinfect dental impressions?

Answer: Firstly, impressions should be washed with water for 10s and then they should be disinfected with a specific product according to the material involved: elastomers (silicones and polyesters) should remain immersed for, at least 5 min, in ammonia and aldehydes-based disinfectants, 10min in 5% sodium hypochlorite or 10 min in 3% hydrogen peroxide; alginates should be sprayed with a 1% sodium hypochlorite-based disinfectant and placed in a closed plastic bag for 10 min[161, 162]. *(Level IIIa Class I)*

21.2. What is the protocol to disinfect dental stone models?

Answer: Regarding dental models handled during the consultation and contaminated with saliva, they should be immersed in a solution of slurry water with 0.5% sodium hypochlorite or 2% glutaraldehyde for 5 min, without the risk of dimensional change[163-165]. *(Level IIIb, Class IIa)*

21.3. What is the protocol for try-in devices (copings, registration waxes, preliminary crowns/bridges and removable prosthesis) disinfection?

Answer: Regarding try-in devices, they can be disinfected with alcohol at 70% for 5 min[127]. *(Level IIb, Class I)*

21.4. What is the protocol to disinfect pre-existing prosthesis?

Answer: Regarding acrylic prosthesis, they should be immersed in an antiseptic solution containing sodium hypochlorite at 1% for 10 min. Prosthesis with metal parts should not be immersed in sodium hypochlorite; alternatively, hydrogen peroxide at 1% should be used during 10 min[166]. *(Level IIa, Class IIa)*

Key Points

- Prints should be washed with running water and subsequently they should be placed into dental impression disinfectant:
  - Elastomers: ammonia and aldehydes-based disinfectants for 5 min; or 5% sodium hypochlorite for 10 min or 3% hydrogen peroxide for 10 min.;
  - Alginates: they should be sprayed with 1% sodium hypochlorite and kept in a closed bag for 10 min. ***(Level IIa Class I)***
- Regarding plaster models handled during the consultation and contaminated with saliva, they should be immersed in a solution of slurry water with 0.5% sodium hypochlorite or 2% glutaraldehyde for 5 min. ***(Level IIIb, Class IIa)***
- Try-in testing devices should be decontaminated in an alcohol-based solution at 70% for 5 min. ***(Level IIb, Class I)***
- Pre-existing acrylic prosthetics should be immersed in a 1% sodium hypochlorite solution for 10 min; if they have metal parts, use 1% hydrogen peroxide instead for 10 min. ***(Level IIa, Class IIa)***

Removal of PPE

22.1. What is the sequence to remove PPE in each one of the levels (1, 2 and 3)?

Answer: There are different ways of removing PPE safely and without contaminating clothes, skin, eyes or oral and nasal mucosae with potentially infectious droplets. All the PPE should be removed before getting out of the office, except the respirator, if applicable. The removal sequence can vary and depends on the patient's risk level or on the procedure to be performed. Goggles and facial protection should be removed from the back, by lifting head band or ear pieces. Remove the face shield, goggles and place them in a specific place on the workbench for subsequent disinfection, if they are reusable; otherwise, discard / dispose ofremove them directly in a waste container[24, 41, 52, 75, 84, 87]. *(Level IV, Class I)*

Level 1:

- Remove the water-resistant gown from the outside, pulling away from shoulders, and rolling it gradually and gently in order to generate the less volume possible and remove hands simultaneously;
- Hands antisepsis with an ABAS;
- Remove cap and surgical mask and wash your hands again.

Level 2:

- Remove the water-resistant gown from the outside, pulling away from shoulders, as in the previous level;
- Remove disposable gloves together with the gown;
- Hand antisepsis with an ABAS;
- Remove eye protection (face shield and goggles) from the back to the front and surgical cap from front to back;
- Remove shoe covers;
- Hand antisepsis with an ABAS;

- Remove FFP2 respirator or equivalent (from the back to the front, pulling elastic bands, without touching the outer side of the mask);
- Hand antisepsis with an ABAS;

Level 3:

- Remove the outer pair of gloves;
- Disinfect inner pair of gloves with ABAS;
- Remove eye protection and surgical cap /hood of the surgical suit (if you are wearing a surgical cap untie it first):
- If you are wearing a face shield: remove the face shield and surgical cap/bouffant cap/hood with a single gesture, from the back to the front, touching only the outside;
- If you are wearing goggles: remove goggle and, if they are reusable, place them in a suitable container; then, remove surgical cap /hood from the back to the front, touching only the outside;
- Remove the gown (unfasten side ties and pull gown away from shoulders touching only the outside, with an abrupt movement) and simultaneously remove inner gloves; or remove surgical suit and then gloves;
- Remove shoe covers;
- Perform hand antisepsis with ABAS;
- Remove respirator FFP2 or FF3 respirator (from the back to the front, pulling elastic bands, without touching the outer side of the mask);
- Hand antisepsis with an ABAS;

Remark: if your hands touch accidentally a contaminated surfaces during removal, immediately disinfect with ABAS.

(read on how to put on PPE - Appendix III, section 2)

22.2. Where should disposable PPE be placed after being removed? In what type of container?

Answer: Disposable PPE should be discarded directly into a group III waste container[167]. *(Level IV, Class I)*

22.3. What is the protocol to remove gloves?

Answer: Except for the perioral areas and the area strictly necessary to perform the procedures, the dentist should never place his/her hands above his/her waist when he/she is wearing PPE, nor touch oneself or the patient, once the gloves outer side is contaminated.

Glove removal protocol[41, 52, 87, 143, 167]: *(Level IV, Class I)*

- Using a gloved hand, grasp the palm area of the other gloved hand and peel off the first one;
- Hold removed glove in gloved hand;
- Slide fingers of ungloved hand under remaining glove and peel off second glove over first glove;
- Discard gloves in a contaminated waste container;
- Disinfect remaining gloves with ABAS;
- After removing the first pair of gloves, hands should be immediately washed using a suitable detergent and antiseptic.

22.4. When and how should the dentist remove the surgical mask?

Answer: Once the patient has left the office, the dentist can remove the surgical mask or respirator, according to the following steps[41, 167]: *(Level IV, Class I)*

The outside of the mask/respirator is contaminated - do not touch it!

Grasp bottom ties or elastics of the surgical mask/respirator and remove without touching the outer area;

Place the surgical mask/respirator and the gloves in the group III waste container.

22.5. When should the assistant remove PPE?

Answer: PPE should only be removed when the office has been completely decontaminated[85]. In routine check-ups, after disinfection and removal of all the disposable means of protection and barriers, the assistant should guarantee the office's aeration, and then put on a new pair of gloves to place again all the means of protection and physical barriers in the office, devices and other consumables, to be ready for the following consultation. *(Level IV, Class I)*

22.6. Can FFP2 (N95) and FFP3 respirators be reused?

Answer: FFP2 and FFP3 respirators can be used for 5 to 6 hours. When used with different patients, they should be covered with a surgical mask, and the latest should be exchanged in the end of each procedure. FFP2 or FFP3 respirators masks should be exchanged every time they get humid or visibly contaminated. It is important to avoid touching the mask's external surface after putting it on[168, 169]. *(Level IV, Class II)*

22.7. In which place should PPE be removed? In the clinical office or somewhere else?

Answer: PPE should be removed before leaving the clinical office, except for the respirator. It is important that you never leave the office or touch surfaces (handlers, tables, support chairs, working benches, drawers, walls, all the surrounding material) with outer or inner pair of gloves which you are wearing[167]. *(Level IV, Class I)*

22.8. Where should the assistant place PPE after being removed?

Answer: The reusable protection suit should be placed in a suitable place inside a closed bag for later processing. Disposable contaminated material should be placed in group III waste containers. Face shields and goggles should be placed in a suitable place for subsequent disinfection[85]. *(Level IV, Class IIa)*

22.9. How should the face shield and the goggles be washed and disinfected?

Answer: In this context, we recommend the following sequence:

(1) Washing the inner surface and then the external surface with a detergent;

(2) Disinfecting the external surface with a suitable disinfectant;

(3) Washing it with running water or spraying with alcohol;

(4) Drying it with absorbent paper or leave it exposed in the air[170].

Remark: this procedure should be performed wearing gloves. *(Level IV, Class I)*

22.10. Can uniforms be worn again the following day without being washed?

Answer: Uniforms should not be worn again the following day without being washed[171]. *(Level IV, Class IIa)*

22.11. What kind of treatment should be given to non-critical fabric materials: uniforms?

Answer: Even though this kind of clothing represents a very reduced risk of SARS-CoV-2 infection and spread, during this pandemic stage it should be washed more often and handled with gloves, or you should always wash your hands after handling them. Wash uniforms according to the manufacturer's instructions. Select the hottest water possible program, and dry them completely in a dryer machine and/or iron them[171]. *(Level IV, Class IIa)*

At home:

22.12. After a day at work how should you behave when you get home?

Answer: Shoes should be left at the door, take your clothes off and have a shower immediately[56]. *(Level IV, Class IIb)*

Key Points

- The removal level 1, 2 and 3 PPE should follow a sequential order. ***(Level IV, Class I)***
- After being removed, the PPE should be placed in the group III waste residues. ***(Level IV, Class I)***
- While you are wearing the PPE, your hands should not touch below your waist, and gloves should be removed according to a particular sequence. ***(Level IV, Class I)***
- The dentist can remove the surgical mask after getting out the office; the assistant can remove the surgical mask after decontaminating the office. ***(Level IV, Class I)***
- FFP2 and FFP3 respirators may be kept for up to 6 hours, once they are protected by a surgical mask exchanged between patients. ***(Level IV, Class II)***
- Face shield and goggles should be washed and disinfected, firstly in the inner side and then the outer side, with water, soap and ABAS. This procedure should be performed wearing gloves. ***(Level IV, Class I)***
- Uniforms should be washed at the end of each day. (Level IV, Class IIa)After a working day, shoes should be taken off and be left at the door, take your clothes off and have a shower immediately. ***(Level IV, Class IIb)***

Patient care after treatment

23.1. Does the use of a surgical mask by the patient inside the clinic reduce the risk of cross contamination with SARS-CoV-2?

Answer: As soon as the procedure is finished and the patient has mouth rinsed, the individual protection mask should immediately be put onl[[63, 88]. *(Level Ib, Class I)*

23.2. Should patients' movement inside the clinical office be limited after the operative procedures?

Answer: The patient should remain seated while registration procedures are performed and the next appointment is made[14]. *(Level IV, Class IIa)*

23.3. Should additional information be provided to the patient in digital form instead of paper form?

Answer: You should ensure that a message is sent to the patient informing about the date and time of the next appointment; make also sure a notification will be sent the day after the consultation. Regarding medical prescriptions, preference should be given to electronic media (e.g. text messages, e-mail)[14]. *(Level IV, Class IIa)*

23.4. How should hand antisepsis be performed before leaving the office, regarding the dentist, the assistant, the patient/accompanying person?

Answer: In the clinical office, there should be an ABAS dispenser to perform hand antisepsis before leaving the office. This action should be repeated at the reception, in the event a surface is touched or if sanitary facilities are used[14, 63]. *(Level IV, Class IIa)*

Key Points

- The patient must remain seated until de next appointment is well-marked, being informed of this by message. ***(Level IV, Class IIa)***
- The patient must leave the consultation with the mask provided at the entrance. ***(Level Ib, Class I)***
- The patient must perform hand antisepsis with ABAS before leaving the office and doing it again at the reception, if necessary. ***(Level IV, Class IIa)***

Patient's return to the Reception

24.1. Should the patient keep social distance at the reception and means of protection after consultation?

Answer: Safety distance should be kept regarding the counter and according to the signaling and physical contact with surfaces and with the receptionist should be avoided[24]. *(Level IV, Class IIa)*

24.2. Should the patient keep the mask on in the reception area after the consultation?

Answer: The patient should always be wearing a protection mask in all the clinic's environments[88]. *(Level IV, Class I)*

24.3. Which important additional information should be provided to the patient by the receptionist, in the context of COVID-19 infection, in the post-consultation stage?

Answer: The receptionist should:

Inform the patient that he/she should contact the clinic/office within 15 days after the consultation if he/she develops symptoms compatible with COVID-19;

Inform the patient in the event any medical staff or non-medical staff (assistants/ receptionist) develop symptoms compatible with COVID-19 within 15 days after the consultation;[57]. *(Level IV, Class IIa)*

24.4. Which information should be confirmed to the patient by the receptionist before leaving the clinic?

Answer: The receptionist should confirm the following information with the patient: consultation registration, validating if the message scheduling the following appointment has been received, and if applicable, reception of medical prescription. Providing antiseptic gel or solution, so that the patient can sanitize his/her hands before leaving;

remind the patient to remove the mask when and only he/she arrives home or, at least, outside the clinic premises; say goodbye to the patient warmly and positively[83]. *(Level IV, Class IIa)*

Key Points

- Guaranteeing the observance of social distance at the reception. ***(Level IV, Class IIa)***
- The patient should always wear a mask at the clinic. ***(Level IV, Class I)***
- In the event the patient develops COVID-19 symptoms within 15 days after the consultation, he/she should contact the clinic; similarly, if any professional at the clinic develops any symptoms, the patient should be informed. ***(Level IV, Class IIa)***
- Before the patient leaves the clinic, clinical registration should be confirmed, as well as the appointment of the following consultation and the validation of the confirmation of the following appointment. ***(Level IV, Class IIa)***
- Before leaving the clinic, the patient should sanitize his/her hands and he/she should also be reminded not to take off the mask until he/she gets home. ***(Level IV, Class IIa)***

Payment methods

25.1. Which payment methods and receipt issuing methods should be recommended?

Answer: Payment and receipt issuing should, preferably, be made using electronic means (dematerialized paperless), namely using contactless cards or *MBway, iPAY,* among others. In the event that it is not possible, the patient should swipe his/her own card for strip or magnetic chip reading. In this case, the patient should enter the code only pressing the keys and without holding the POS terminal; keep the payment terminal machine duly protected with plastic wrap and place another film over the keys, whenever a patient needs to enter a personal code. Once the patient has used and entered the code, the plastic wrap should immediately be removed or a 70% alcohol disinfectant should be applied[172]. Using a payment card makes cleaning and disinfection easier comparatively with paper money, once there is not a suitable disinfection method for this kind of money, despite the fact that the risk of infection due to the handling of this kind of money seems to be very reduced in the light of the existing evidence. *(Level IV, Class IIa)*

Key Points

- Payments made preferably using electronic means - contactless, MBway, iPAY and others. If that is not possible, the patient should handle his/her own card. ***(Level IV, Class IIa)***
- After using the POS terminal, the protection should be replaced or a 70% alcohol solution should be applied. ***(Level IV, Class IIa)***

Sterilizing

Material Cleaning, Disinfection and Sterilization Standards

26.1. Does contamination with SARS-CoV-2 imply a change of the procedures used to clean, decontaminate and sterilize materials and instruments?

Answer: It does not imply a change of good practice, however the recommended procedures should be reminded. Non-rotary instruments should be pre-processed (decontaminated) with a suitable disinfectant or with a 5% sodium hypochlorite solution (pay attention to metals), for 30 minutes; washed with water, placed in the ultrasonic container with an enzymatic disinfectant for the recommended time and at the recommended temperature; after getting dry, they should be placed in a sterilization sleeve (in kits or individually) and placed in the autoclave. Rotary instruments should be submitted to a pre-treatment with a 70% alcohol solution, a detergent washing and, after getting dry, they should be lubricated, placed in the sterilization sleeve and in the autoclave. After the autoclave and before being used again, rotary instruments can be lubricated again, manually or in dedicated equipment. Instruments which get in contact with the patient's oral mucous membranes and fluids (e.g., dental mirror, tweezers, restorative material applicators) should be considered as semi-critical and should be sterilized using thermal methods (steam and pressure - autoclave; chemical vapor - formaldehyde; dry heat); semi-critical instruments sensitive to heat should not be reused, they should be discarded instead. Surgical instruments and other instruments which penetrate soft tissues or bones (forceps, periodontal curettes, bone drills, etc.) should be considered as critical and, if they are reusable, they should be sterilized in the autoclave[85, 123, 126, 151, 159]. *(Level IIIb, Class IIa)*

26.2. Which kind of bag is indicated to pack group III waste?

Answer: Waste resulting from each consultation should be packed in a suitable bag sealed with ties, sprayed with sodium hypochlorite and placed in a storing container to be collected by the certified company[24]. *(Level IV, Class I)*

26.3. Should the placement of group III waste in the corresponding container be performed in the clinical office or in the sterilizing room?

Answer: It should be performed as close as possible to the place where the waste is produced, i.e. inside the office[24]. *(Level IV, Class I)*

26.4. Does contamination with SARS-CoV-2 imply a change of the procedures used to handle and process waste?

Answer: This virus contamination degree implies protocolized and multiplied care to minimize the risk of cross infection[85]. *(Level IV, Class IIa)*

26.5. Should the material/instruments handled by the dentist be considered as semi-critical or critical?

Answer: All the material/instruments handled by the dentist should be considered as critical. It should be sterilized, as long as its characteristics allow it. For biosafety purposes, non-critical material should be processed as semi-critical material when it is handled by the dentist[173]. *(Level IV, Class I)*

Basic principles to follow:

Whatever can be sterilized should not be disinfected;

Always give preference to physical sterilizing methods, namely by heat (autoclave).

26.6. Should the material/instruments handled by the dental assistant be considered as semi-critical or critical?

Answer: All the material/instruments handled by the dental assistant and which came into contact with the patient's mucous membranes, saliva or other fluids should be considered as critical. If it is not disposable, it should be sterilized, as long as its characteristics allow it. When that is not possible, it must be disinfected[173]. *(Level IV, Class I)*

26.7. Is it possible to disinfect FFP2 (N95) and FFP3 respirators?

Answer: FFP2 respirators can be disinfected with hydrogen peroxide vapors and UV light; however, these procedures are only justified in times of lack of equipment, once there is not enough evidence in literature to validate these procedures[174]. *(Level IIb, Class IIb)*

Key Points

- All the material handled by the doctor and the assistant is considered as critical and should be sterilized in autoclave, whenever manufacturer's instructions allow it. ***(Level IV, Class I)***
- Non-rotary instruments should be decontaminated (Level IIb, Class IIb) with a suitable solution or with a 5% sodium hypochlorite solution, washed with water, placed in the ultrasonic container (enzymatic detergent), dried and placed in a sterilization sleeve and autoclave, according to manufacturer's instructions. ***(Level IIIb, Class IIa)***
- Rotary instruments: 70% alcohol solution, detergent washing, dried, placed in sterilization sleeve and autoclave. ***(Level IV, Class IIa)***
- Material which gets in contact with the oral cavity: we recommend sterilization in the autoclave. ***(Level IV, Class IIa)***
- Group III waste should be placed in a suitable bag, tied and sprayed with hypochlorite. Its disposal in the container should be performed in the clinical office. ***(Level IV, Class I)***

Accidental Exposure

How to act in the event of Accidental Exposure

27.1. Is the oral cavity a tropism location for SARS-CoV-2?

Answer: There is an urgent need for information about the specific local tropism of this virus in the human body, to allow us to understand its replication, immune response and infectiousness. Most coronaviruses bind to cell receptors through a spike protein. SARS-CoV-2 uses ACE2, expressed in different organs, as a key receptor[175]. The affinity for this receptor seems to be greater with this virus than with other coronaviruses[176]. The predominant expression of ACE2 in the lower respiratory tract is believed to have determined the natural history of SARS-CoV-2 as a respiratory infection of the lower tract. However, there is evidence of tropism for oropharyngeal cells, with an active replication during the first 5 days after the onset of symptoms and with a high viral load in saliva in the posterior oropharynx[176, 177]. In a preclinical model with non-human primates, salivary gland ducts were the early target cells of SARS-CoV and, therefore, a source of viral load in saliva[178]. Posterior oropharynx is a meeting point for secretions from the posterior nasopharynx, the tracheobronchial tree and salivary glands. Preliminary data show that there is a high expression of ACE2 receptors in the epithelial cells of oral mucosa, which was higher in tongue, indicating that the oral cavity may be a potentially higher risk route of SARS-CoV-2 infection[179].

Several places in the oral mucosa were identified, expressing the main key receptor which establishes the connection to SARS-CoV-2 and mediates intracellular invasion. Even though there is no evidence of the direct action of this tropism as a preferential niche for viral colonization, preliminary data establish rational proof of this mechanism, which indicates that the oral cavity may be a highly susceptible place for SARS-CoV-2 infection. *(Level IV, Class I)*

27.2. In the event of an accidental exposure to biological contaminants from a COVID-19 patient, which procedure should be adopted?

Answer: Regarding the hands (without protection or with gloves which have lost their protection barrier, ex accidental perforation), you should perform their immediate antisepsis with ABAS. The skin is the most external barrier of the human body. Health professionals working with COVID-19 patients are prone to damages of their skin and mucosa barriers. To minimize the break of skin and mucosa barriers, health professionals should observe the standards related to the use of PPE and avoid an excessive exposure. Regarding mucous membranes, namely the ocular conjunctiva, an immediate washing with water or a saline solution should be performed. In the case of a suspected exposure when removing the goggles, the periocular area should immediately be cleaned with a cotton ball soaked in ethanol at 70%. Bear in mind that the excess of ethanol can cause conjunctiva and cornea irritation. Additionally, we recommend the implementation of measures related to skin and mucosa care during work[180]. (read question 6.4., section 6) *(Level IV, Class I)*

Key Points

- In the event of accidental cutaneous exposure to biological contaminants from a COVID-19 patient, you should immediately perform antisepsis with ABAS. ***(Level IV, Class I)***
- In the event of accidental exposure of the ocular conjunctiva, you should remove your goggles, wash with water and a saline solution and decontaminate the periocular area with a 70% ethanol solution. ***(Level IV, Class I)***
- We recommend prophylactic measures to preserve skin and mucosa integrity during working hours. ***(Level IV, Class I)***

Conclusion

(Appendix IV to read the recommendations in the form of a schedule, as well as check-lists to support you during adaptation phase)

Future Perspectives

The group intends to answer all the questions concerning the different intervention stages, pre-, peri- and post-. Nonetheless, at this stage, we considered it was more prudent to establish an urgency hierarchy of response to the questions which intrigue health professionals and all their team the most. The critical evaluation of the evidence according to standardized systems shall also be a long-term aim, once the evidence on this topic is growing exponentially, with methods increasingly structured.

Presently, there are surveys in the field of seasonal variation of SARS-CoV-2 transmissibility, once it has the potential to modulate the spread of the virus. The spread of the virus in tropical climates, such as Singapore, is well known, and, however, winter is not a necessary condition to the spread of SARS-CoV-2. Furthermore, these surveys expose issues which may be preponderant to establish future attitudes and prevention measures[181]:

Reductions in the prevalence may be related to the seasonal variation of transmissibility, without neglecting well-succeeded interventions;

Subpopulation dynamics is very uneven in terms of counting methods of positive cases;

Seasonal variation can be a window of opportunity for a better preparation of health systems to fight a new outbreak;

SARS-CoV-2 may become an endemic seasonal CoV, similar to *Influenza* virus.

The future envisages the adaptation and adoption of new measures, such as *Big Data* and telemedicine.

Big Data is gaining international dimension in the perception of the necessary measures to monitor and detect prematurely new outbreaks of infectious diseases. It is a public health vehicle to detect, report and control emerging outbreaks. It is based on data sets and computational approaches which allow to reveal trends, patterns and predictive

probabilities. It is based on the Vs triad: volume (amount of data collected); velocity (rate at which data are collected and spread); variety (multiplicity of sources used to compile data)[182].

Telemedicine allows to treat patients in their own homes with a great virtual medical support. It was a solution designed with the aim of facilitating medical consultations in disaster periods and public health emergencies[183]. It is necessary to understand its applicability in dentistry; nonetheless, in pandemic times caused by SARS-CoV-2 it has been an essential tool in patients' triage process.

SARS-CoV-2 will be a milestone in the history of humankind and it made health professionals aware of the importance, even grater nowadays, of continuous monitoring and early detection. The greatest challenge is indeed the time for the preparation and response to situations such as the one we live in[182]!

Updating

Taking into account the experience of just 4 months with COVID-19, these Clinical Guidelines shall be object of continuous updating, and they can also be kept, revised or completely redrafted.

Appendix I

Advisory Commission

| *Advisory Board*

Doctor Ana Lúcia de Pereira Neves Messias

Guest Teaching Assistant at the Faculty of Medicine of the University of Coimbra

Professor Professor Aníbal Diógenes

Associate Professor at the University of Texas, *Health Center of San Antonio*, United States of America

Doctor and Professor António Vaz Carneiro

Full Professor of Medicine at the Faculty of Medicine of the University of Lisbon and Director of Cochrane Portugal

Doctor and Professor Carlos Robalo Cordeiro

Director of the Faculty of Medicine of the University of Coimbra

Doctor and Professor Gil Alcoforado

Full Professor

Doctor and Professor Ion Zabalegui

Guest Professor at the University *Complutense* of Madrid, Spain

Doctor José Manuel da Costa Rodrigues de Oliveira

Dentist

Doctor and Professor José Frias Bulhosa

Representative of the Portuguese Dentist National Association of the National Health Service

Doctor Luís António Silva Ferreira

Dentist

Doctor and Professor Luís Pires Lopes

Head of the Faculty of Dental Medicine of the University of Lisbon

Doctor and Manuel Gameiro

Full Professor at the Mechanical Engineering Department of the University of Coimbra

Doctor and Professor Maria Helena Raposo Fernandes

Full Professor at the Faculty of Dental Medicine of the University of Oporto

Doctor and Professor Mário Bernardo

Coordinator of the Integrated Master Degree in Dental Medicine at the Faculty of Dental Medicine at the University of Lisbon

Doctor and Professor Mário Bernardo

Full Professor at the University *Complutense* of Madrid, Spain

Doctor and Professor Marlene Barros

Head of the Faculty of Dental Medicine of the Catholic University of Portugal

Doctor Paulo Manuel de Oliveira Nunes

Dentist

Doctor Nuno Ventura

Dentist

Doctor Ricardo Jorge Martins

Dentist

Doctor and Professor Sandra Gavinha

Head of the Faculty of Health Sciences of Fernando Pessoa University

Appendix II

Materials and Methods

Section 1 | Questions

PRE-
1.1. How can you manage the schedule?
1.2. Should the patient be alerted to be on time for the appointment?
1.3. Should the patient be alerted to avoid bringing personal ornaments to the appointment?
1.4. Should the patient be alerted to avoid paying the consultation in cash?
1.5. What are you supposed to do if a patient asks for a teleconsultation?
2.1. Which questions must be asked while making an appointment by telephone?
2.2. If the patient answers in the affirmative to any of the questions included in the questionnaire referred to in 2.1, but refers absence of fever, how is scheduling supposed to be handled?
2.3. While scheduling an appointment for a patient having a professional profile of risk, as is the case of health professionals, or hospital environment, day care center or retirement homes employees, should there be any particular care?
2.4. The patient refers having been infected with SARS-CoV-2 but they have already tested negative since. How is one expected to proceed?
2.5. How should one tackle the situation of a patient having a clinical history of COVID-19 and who is in home isolation?
2.6. A patient goes spontaneously to the clinic to schedule an appointment without having previously called. What is the receptionist supposed to do?
2.7. Should the accompanying person be advised not to come, whenever possible, and/or avoid their permanence in any place of the clinic?
2.8. If the patient comes accompanied, is it necessary for the accompanying person to go through the triage for COVID-19?
3.1. How can you make means of disinfection and protection available to those entering the clinic?
3.2. Which special measures must be applied in this costumer service area?
3.3. How should you organize the waiting room?
3.4. How many people can remain in the waiting room? What is the advised capacity?
3.5. Which furniture can there be in the waiting room?
3.6. Should magazines or newspapers be available?
3.7. Should the TV and air conditioning remote controls be available?
3.8. Should the water dispenser or the coffee machine be available?
3.9. Which changes must be made in the sanitary facilities?
3.10. Which means of decontamination must be available at the sanitary facilities?

4.1. Should there be physical barriers between the reception and the user?
4.2. Which signposting can indicate the organization of the waiting spaces or the interdiction of crossing without permission?
4.3. Which informative billboards on COVID-19 must be posted and where?
5.1. What is the rationale behind hand washing?
5.2. How and when should you wash your hands?
5.3. Which products must be used to sanitize the hands?
5.4. Which are the methods that keep hands' skin healthy?
5.5. Should the patient be allowed to brush their teeth, prostheses or removable braces before stepping inside the consultation office?
6.1. How often should you clean?
6.2. How should you clean surfaces?
6.3. How should you do this cleaning?
6.4. Which cleaning/disinfection products must be used?
6.5. What are the most critical surfaces?
6.6. How often should the most critical areas or surfaces be cleaned?
6.7. What are the materials you must use while cleaning the most critical areas?
6.8. How often must you clean the sanitary facilities?
6.9. How should you clean the sanitary facilities?
6.10. Which are the most critical surfaces in the sanitary facilities?
6.11 Which products must be used to clean the sanitary facilities?
6.12. What are the materials that you must use to clean the sanitary facilities?
7.1. How can the receptionist keep a social distancing, minimizing the fear that this measure might arouse on the patient?
7.2. What should you do after finishing serving a patient/accompanying person and before serving the following one?
7.3. Should there be separate entrances for users and professionals?
7.4. What is the minimum mandatory recommendation of personal protective equipment at the dental clinic?
8.1. Am I able to go to work?
8.2. I have a relative (who is part of my household) who is sick with COVID-19. Can I go to work?
8.3. I am pregnant or more than 65 years old, I suffer from related systemic pathologies of higher risk. Can I go to work?
8.4. How is it possible to control if the staff are infected?
9.1. What should be checked as soon as the patient enters the clinic?

9.2. The patient is feverish or reports having had fever and cough or sore throat and muscular pains over the last 24h. What should you do?
9.3. The patient is not feverish. What should you do next?
9.4. Can the patient come accompanied?
9.5. Should the accompanying person wear a mask too?
9.6. In case the accompanying person walks into the clinical office, where should they remain and how should you proceed?
9.7. In case the accompanying person does not enter the clinical office, where should they wait?
9.8. What should you do with the patient's belongings (and the accompanying person's as well, if they happen to walk into the consultation office) before putting on the appropriate PPE?
10.1. How should maintenance technicians be welcome?
11.1. How should delivery men be welcome?
12.1. How should waste collection employees be welcome?
13.1. What is the appropriate protective equipment?
14.1. What is the appropriate protective equipment?

PERI-
15.1. Should risk areas be identified at the clinic?
15.2. What are the differentiated recommendations for the different risk areas?
15.3. How should the general procedures in a clinic be ranked in terms of risk?
15.4 How should the different clinical procedures be ranked in terms of risk?
16.1. What is the stability of the virus in the atmosphere?
16.2. What is the reach of contaminated aerosols released in normal breathing in a closed environment?
16.3. Which distance may reach the aerosols generated during the operative procedures in Dentistry?
16.4. How should dental equipment and the surrounding surfaces be protected?
16.5. How should the disinfection of the several components and infrastructures of the consultation office be carried out?
16.6. What is the most suitable ventilation system in a clinical office?
16.7. Is the use of additional systems of purification of biological contaminants in the air of the clinical office justified?
16.8. What must the acclimatization conditions at the clinical office be?
16.9. Is it advisable to use means of microbiological decontamination in the water supply systems and water reservoirs of the equipment?
16.10. What is the effectiveness of suction systems in the reduction of the generation of aerosols at the source of contamination?
16.11. Does the use of antimicrobials in the irrigation system of the ultrasonic devices reduce the risk of contamination during aerosolization?
17.1. Must the PPE to be worn be defined by the risk involved in the procedure?
17.2. What is the appropriate PPE according to the levels of protection?
17.3. Which type of masks are there? And what is the indication for its clinical use?
17.4. What should you do before putting the PPE on?
17.5. How are you supposed to put the PPE on?
17.6. What care should be taken over the use of PPE?
17.7. What are you supposed to do if the first pair of gloves (inner pair in degree 3 protection PPE) touches a potentially contaminated area?
18.1. How can you reduce microbiological burden in intraoperative stage?
18.2. Should a perioral decontamination be performed? How should it be performed?
18.3. What is the importance of using a rubber dam?
18.4. Should priority be given to the use of single-dose materials?
19.1. What is the impact of operative instruments on aerosol generation?

19.2. Which specifications should cutting/preparation operating instruments have? Are non-return systems better?

POST-
20.1. I have finished the operative procedure. What comes next?
20.2. Which are the critical surfaces?
20.3. How can you minimize contamination and perform the cleaning of critical areas?
20.4. Should protection barriers in screen surfaces, keyboards and mice be removed between patients?
20.5. What care should I take with the casing of the digital imaging sensor and the intraoral x-ray films?
20.6. How should X-ray positioners be disinfected?
20.7. How should digital imaging sensors, intraoral cameras and scanners be protected and disinfected?
20.8. Should the purge of rotary instruments be performed before being removed to be sterilized?
20.9. Is chemical external disinfection of turbines, counter-angles and scalers enough against SARS-CoV2 or should they be sterilized between patients?
20.10. What is the sequence for physical barriers and rotary instruments removal?
20.11. How should physical barriers to protect the equipment be eliminated?
20.12. Regarding surface disinfection (equipment and workbenches), which product is more efficient and for how long should contact time be?
20.13. Is UV radiation an effective sterilization method?
20.14. Regarding wrapping and packaging of the consumables used, which is the most suitable disinfection product and what is its contact time?
20.15. Is it necessary to make the suitable aeration of the clinical office before starting the following consultation?
20.16. How often should the clinical office's floor be cleaned and disinfected?
20.17. Regarding the clinical office's floor, which product should be used and for how long should it be left in contact to achieve a suitable disinfection?
20.18. How should the clinical office cleaning be performed?
20.19. Which cleaning/disinfection products should be used?
20.20. Which types of presentation should cleaning products have?
20.21. What is the most suitable disinfectant to be used in the form of wipes?
20.22. How should surfaces be cleaned in the event they are contaminated with blood or other organic products?
21.1. What is the protocol to disinfect dental impressions?
21.2. What is the protocol to disinfect dental stone models?

21.3. What is the protocol for try-in devices (copings, registration waxes, preliminary crowns/bridges and removable prosthesis) disinfection?
21.4. What is the protocol to disinfect pre-existing prosthesis?
22.1. What is the sequence to remove PPE in each one of the levels (1, 2 and 3)?
22.2. Where should disposable PPE be placed after being removed? In what type of container?
22.3. What is the protocol to remove gloves?
22.4. When and how should the dentist remove the surgical mask?
22.5. When should the assistant remove PPE?
22.6. Can FFP2 (N95) and FFP3 respiratorsbe reused?
22.7. In which place should PPE be removed? In the clinical office or somewhere else?
22.8. Where should the assistant place PPE after being removed?
22.9. How should the face shield and the goggles be washed and disinfected?
22.10. Can uniforms be worn again the following day without being washed?
22.11. What kind of treatment should be given to non-critical fabric materials: uniforms?
22.12. After a day at work how should you behave when you get home?
23.1. Does the use of a surgical mask by the patient inside the clinic reduce the risk of cross contamination with SARS-CoV-2?
23.2. Should patients' movement inside the clinical office be limited after the operating procedures?
23.3. Should additional information be provided to the patient in digital form instead of paper form?
23.4. How should hand antisepsis be performed before leaving the office, regarding the dentist, the assistant, the patient/accompanying person?
24.1. Should the patient keep social distance at the reception and means of protection after consultation?
24.2. Should the patient keep the mask on in the reception area after the consultation?
24.3. Which important additional information should be provided to the patient by the receptionist, in the context of COVID-19 infection, in the post-consultation stage?
24.4. Which information should be confirmed to the patient by the receptionist before leaving the clinic?
25.1. Which payment methods and receipt issuing methods should be recommended?
26.1. Does contamination with SARS-CoV-2 imply a change of the procedures used to clean, decontaminate and sterilize materials and instruments?
26.2. Which kind of bag is indicated to pack group III waste?
26.3. Should the placement of group III waste in the corresponding container be performed in the clinical office or in the sterilizing room?

26.4. Does contamination with SARS-CoV-2 imply a change of the procedures used to handle and process waste?
26.5. Should the material/instruments handled by the dentist be considered as semi-critical or critical?
26.6. Should the material/instruments handled by the dental assistant be considered as semi-critical or critical?
26.7. Is it possible to disinfect FFP2 (N95) and FFP3 respirators?
27.1. Is the oral cavity a tropism location for SARS-CoV-2?
27.2. In the event of an accidental exposure to biological contaminants from a COVID-19 patient, which procedure should be adopted?

Table 1 - Algorithm established by the proofreader - Stage 1 (AV; CM)

1	SARS.ti,ab,kw
2	MERS.ti,ab,kw
3	SARS-Co-2.ti,ab,kw
4	COVID-19 or COVID-19 or coronavirus*.ti,ab,kw
5	OR/3,4
6	Influenza.ti,ab,kw
7	Dentistry/
8	AND/1,7
9	AND/2,7
10	AND/5,7
11	AND/6,7
12	Aerosol.ti,ab,kw
13	Air.ti,ab,kw
14	OR/12, 13
15	AND/1, 14
16	Ventilator.ti,ab,kw
17	Oral hygiene.ti,ab,kw
18	OR/16, 17
19	AND/7, 18

Table 2 - Algorithm adapted from NICE - Stage 2[1]

1	exp coronavirus/
2	((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw.
3	*((coronavirus* OR coronovirus* OR coronavirinae* OR Coronavirus* OR Coronovirus* OR Wuhan* OR Hubei* OR* ***huaian*** *OR "2019-nCoV" OR 2019nCoV OR nCoV2019 OR "nCoV-2019" OR "COVID-19" OR COVID19 OR "CORVID-19" OR CORVID19 OR "WN-CoV" OR* ***Inco*** *OR "HCoV-19" OR HCoV19 OR CoV OR "2019 novel*" OR ncov OR "n-cov" OR "SARS-CoV-2" OR "SARSCoV-2" OR "SARSCoV2" OR "SARS-CoV2" OR SARSCov19 OR "SARS-Cov19" OR "SARSCov-19" OR "SARS-Cov-19" OR* ***ncolor*** *OR Ncorona* OR Ncorono* OR NcovWuhan* OR NcovHubei* OR NcovChina* OR NcovChinese*) .ti, ab, kw.) all*
4	(((respiratory* adj2 (symptom* or disease* or illness* or condition*)) or "seafood market*" or "food market*") adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw.
5	((outbreak* or wildlife* or pandemic* or epidemic*) adj1 (China* or Chinese* or Huanan*)).ti,ab,kw.
6	"severe acute respiratory syndrome*".ti,ab,kw.
7	or/1-6
8	limit 7 to yr="2019 -Current"

Section 3 | Articles Included

Reference	Author, Year	Participants	Intervention	Comparison	*Outcome*	Remarks
1	NICE. 2020	-	-	-	*Guidelines* to establish clinical guidelines in a fast way	-
2	El Zowalaty ME, Jarhult. 2020	-	-	-	SARS-CoV-2 as a potential pandemic	-
3	Xu J, Chen Y, *et al.* 2020	-	-	-	Coronavirus: a global pandemic?	-
4	Sohraibi C, Alsafi Z, *et al.* 2020	-	-	-	Coronavirus - the 21st century pandemic	-
4	Amodio E, Vitale F, *et al.* 2020	-	-	-	SARS-CoV-2 - an emerging pandemic	-
6	Chan KW, Wong VT,	-	-	-	SARS-CoV-2: epidemiology, clinical aspects, preventive measures and therapeutics	-
7	Coronaviridae Study Group of the International Committee on Taxonomy 2019	-	-	-	Classification of the novel coronavirus	-
8	Guan W, Ni Z, *et al.* 2020	-	-	-	Clinical characteristics of SARS-CoV-2 virus, diagnosis	Patient/Accompanying person triage procedure
9	Spagnuolo G, de Vito D, *et al. 2020*	-	-	-	Care to be taken before scheduling and emergency consultation	-
10	Ungaro RC, Sullivan T, *et al.* 2020	-	-	-	Preventive measures related to the novel coronavirus	-
11	Borges Nascimento IJ 2020	-	-	-	SARS-CoV-2 - interhuman transmission	-
12	WHO 2020	-	-	-	Patient triage. PPE according to the patent's risk, 5 crucial moments in hand washing, empirical precautions, precautions regarding aerosol generation, surface cleaning	-
13	Xia N, Wang G, *et al.* 2020	-	-	-	Serological tests	-
14	Meng L, Hua F, Bian Z. 2020	-	-	-	Infection control in dental medicine consultation + recommendations	-
15	Droegemeier K. 2020	-	-	-	Surface stability of SARS-CoV 2, incubation period	-
16	Bai Y, Yao L, *et al.* 2020	-	-	-	Transmission of SARS-CoV-2 in asymptomatic patients	-
17	Wang Q, Yu C. 2020	-	-	-	Endemic areas of SARS-CoV-2	-
18	Zou L, Ruan F, *et l,* 2020	-	-	-	Viral load in the upper respiratory tract by SARS-CoV-2	-
19	National Research Council 2020.	-	-	-	Bioaerosols: potential surface stability of Sars-Cov-2	-

20	CDC 2020	-	-	-	Prevention protocol of infection by SARS-CoV-2	-
21	Huang C,Hang Y, *et l,* 2019	-	-	-	Clinical aspects of patients infected with SARS-CoV-2	-
22	Santarpia J, Rivera D, *et al.* 2020	-	-	-	Transmission of SARS-CoV-2 in saliva	-
23	Li Y, Leung GM, *et al.* 2020	-	-	-	Air duration control: space ventilation, negative pressure, etc.	-
24	Peng X, Xu X, *et al.* 2020	-	-	-	Transmission routes of Covid-19 virus during dental practice, and preventive measures in pre-, peri- and post- operative stages	-
25	Rosenfeld RM, Shiffman RN. 2009	-	-	-	Guideline of EBD	-
26	CDC. 2005	-	-	-	*Guidelines* for prevention of transmission of *Mycobacterium*	-
27	Administração Central do Sistema de Saúde IP. 2008	-	-	-	Technical Specifications for HVAC implementation	ET 06/2008 V.2014
28	CDC. 2003	-	-	-	Appendix B - air quality and cross infection control	-
29	New York Stat Department of Health. 2014	-	-	-	Guidelines for hospital and clinic construction	-
30	US Department of Veterans Affairs. Office of Construction & Facilities Management. 2014	-	-	-	Guideline for dental medicine clinics	-
31	Harrel SK, Molinari J. 2004	-	-	-	Aerosols in Dentistry: infection control implications	-
32	Helmis CG, Tzoutzas J, *et al.* 2007	-	-	-	Air quality in a dentistry clinic	-
33	Li Y, Leung GM, *et al.* 2007	-	-	-	The role of ventilation in airborne transmission of infectious agents in the built environment - a multidisciplinary systematic review	-
34	Raghunath N, Meenakshi S. 2016	-	-	-	Aerosols in Dental Practice	-
35	Qian H, Zheng X. 2018	-	-	-	Ventilation control for airborne transmission of human-exhaled bio-aerosols in buildings	-
36	Silva, MG. 2020	-	-	-	Transmission mechanisms of SARS-CoV-2	-
37	OSHA. 2020	-	-	-	*Guidelines on preparing different workplaces in post-pandemic stage*	Definition of risk of procedures of different categories
38	WHO.2020	-	-	-	*Guidelines* to monitor patients suspected of SARS-CoV-2 infection	-
39	Bioseguridad para la Atención Odontológica COVID 19 2020	-	-	-	Preventive measures: Telemedicine, Instructions to go to the consultation, entrance at the clinic, reception, waiting room, toilets	-
40	Zhang W, Jiang X. 2020	-	-	-	Prevention and control of coronavirus in dental clinics - control of medical teams, patient triage	-
41	Huh S. 2020	-	-	-	PPE to treat COVID positive patients	-

42	van Doremalen N, Bushmaker T, *et al.* 2020	-	-	-	Aerosol stability in sars-cov 1 and 2	-
43	Lurie N, Carrr BG. 2020	-	-	-	Telehealth in the response and support to disasters	-
44	Reeves JJ, Hollandsworth HM, *et al.* 2020	-	-	-	Describing the implementation of technological support for optimizing clinical management during COVID-19 pandemic.	-
45	DGS. 2020	-	-	-	Prevention and Control of Infection with SARS-CoV-2 (COVID-19): PPE	Standard 007/2020 29/03/2020
46	Smales FC, Samaranyake LP. 2003.	-	-	-	Maintaining dental care in sars-cov1 (2003)	-
47	Li RW, Leung KW, *et al.* 2004	-	-	-	Recommendations for clinical management of sars-cov-1 patients (potential cases, unprotected contact, contact with sars-cov 1 patients in less than 10 days or asymptomatic patients; measures to control cross infection)	Coughing and sneezing can generate aerosols with 0,001 µm to 10,000 µm
48	Samaranayake LP, Peiris M. 2004	-	-	-	Implications of sars-cov-1 in dentistry: identifying a patient, hand hygiene, PPEs.	They refer mouth rinse with chlorhexidine between 0.12 and 2% before dental treatments
49	Huang Z, Zhao S, *et al.* 2020	-	-	-	Establishing management strategies and protocol of procedures in the radiology department during COVID-19 outbreak	Strategies directed to the *staff and patients*
50	Lai T, Tang E, *et al.* 2020	-	-	-	Proposal of a model to be adopted in ophthalmic consultation to prevent cross contamination with COVID (pre-, peri-)	It includes a questionnaire to ask the patient before the consultation
51	Maragakis, L. 2020	-	-	-	Questionnaire which helps the patient understand if he/she may be infected with SARS-CoV-2 and if he/she should make an appointment	-
52	Repici A, Maselli R, *et al.* 2020	-	-	-	Wearing PPE according to the patient's risk: the patient's dress code; PPE of the OS according to the risk; how to don and remove it. Treatment in negative pressure rooms	Performing upper and lower endoscopy Potential extrapolation to Dental Medicine?
53	Zhang Y, Sun Z, *et al.* 2020	-	-	-	Procedures adopted in a hospital in China to control patients infected with COVID-19	The final questionnaire seems to be relevant to classify persons at risk - I leave to the *experts*' consideration the relevance of this evidence to be included in the recommendations
54	DGS. 2020				COVID-19: Mitigation Phase. Procedures regarding Residential Structures for the Elderly (ERPI), Integrated Long-Term Care Facilities (UCCI) of the National Long-Term Care Network (RNCCI) and other responses directed to the elderly; hosting institutions for children and young people at risk.	Guideline 009/2020 of 11/03/2020. Updated on 07/04/2020.
55	DGS. 2020	-	-	-	COVID-19: MITIGATION PHASE: Approaching Patients Suspected of being Infected or actually Infected with SARS-CoV-2	Standard 004/2020 23/03/2020

56	ADA 2020	-	-	-	Minimizing the risk of COVID-19 transmission	-
57	ECDC. 2020	-	-	-	Criteria to identify COVID-19	-
58	DGS. 2020	-	-	-	Infection with SARS-CoV-2 (COVID-19) - Social Distance and Isolation	Guideline 010/2020 of 16/03/2020.
59	OMD 2020	-	-	-	Treating patients with COVID-19 or of high infection risk	-
60	OMD 2020	-	-	-	Preventive care and Dental Medicine consultations	-
61	DGS. 2020	-	-	-	COVID-19: MITIGATION PHASE: Approaching Patients Suspected of being Infected or Infected with SARS-CoV-2	Standard 004/2020 23/03/2020 updated on 25/04/2020
62	Zhang W, Jiang X. 2020	-	-	-	Prevention and control of coronavirus in dental clinics - control of medical teams, patient triage	-
63	DGS. 2020	-	-	-	Infection with SARS-CoV-2 (COVID-19): Measures to prevent transmission in customer service facilities	Guideline 011/2020 17/03/2020
64	Boyce JM, Pittet D, *et al.* 2002	-	-	-	*Guidelines* for hand hygiene in health care settings	-
65	Guangming Y, Hualiang L, *et al.* 2020	-	-	-	Environmental contamination with SARS-CoV-2	A call of attention for the importance of PPE
66	CDC 2020	-	-	-	Guidelines to control the infection in hospital environments	-
67	Consejo Dentistas. Organizacion Colegial de Dentistas de España 2020	-	-	-	Guidelines from the *Colégio de dentistas* to act during COVID 19 pandemic	-
68	CDC. 2019	-	-	-	*Guidelines* to clean health care facilities	-
69	Lotfinejad N, Peters A, *et al.* 2020	-	-	-	Recommendations regarding hand hygiene importance during COVID-19 pandemic period	-
70	Allegranzi B, Bagheri NS, *et al.* 2011	220 articles for final revision	-	-	Developing countries - infection prevalence/incidence (including overall infections associated to health care, major infection sites and microbiological causes)	-
71	Jefferson T, Del Mar CB, *et al.* 2011	66 articles			Physical intervention measures to reduce or interrupt the spread of respiratory viruses	SARS-CoV-2 is a virus associated to Acute Respiratory Syndrome
72	Basile C, Combe C, *et al.* 2020	-	-	-	*Guidelines* for practices to control the transmission and control of patients infected with COVID-19 in hemodialysis centers	-
73	WHO 2009	-	-	-	*Educational guidelines* on hand hygiene procedure Awareness of the importance of this procedure as a preventive measure	-
74	Picheansathian W. 2004	-	-	-	The effectiveness of solutions for hand hygiene	-
75	CDC. 2003	-	-	-	Infection control in dental facilities	Adaptation to SARS-CoV-2:

76	Sebastiani FR, Dym H, *et al.* 2017	-	-	-	*Guidelines* for infection control in dental office	Improving the effectiveness and impact of interventions in public health.
77	Kampf G, Löffler H. 2003	-	-	-	Dermatological changes in hands exposed to ABAS	-
78	DGS.2020	-	-	-	Infection with SARS-CoV-2 (COVID-19): Cleaning and disinfection of surfaces in customer service facilities or similar facilities.	Guideline 014/2020 21/02/2020
79	CDC. 2003	-	-	-	Guidelines to control the infection in hospital environments	-
80	Kundrapu S, Sunkesula V, *et al.* 2012	215 rooms of patients with CDI and MRSA	Effectiveness of disinfection of high-touch surfaces to reduce health-care workers contamination	-	Daily disinfection of High-Touch Surfaces reduces the acquisition of these pathogens on health-care professionals after contacting these surfaces	-
81	European Centre for Disease Prevention and Control 2020	-	-	-	Disinfection/Cleaning in health-care settings	-
82	Consejo Dentistas. Organizacion Colegial de Dentistas de España 2020	-	-	-	Guidelines from the *Colégio de dentistas* to act during COVID 19 pandemic	-
83	Consejo Dentistas. Organizacion Colegial de Dentistas de España 2020	-	-	-	Good practices recommendation for urgency consultations in dental medicine	-
84	DGS. 2020	-	-	-	Prevention and Control of Infection with SARS-CoV-2 (COVID-19): PPE	Standard 007/2020 29/03/2020
85	Handbook of COVID19 Prevention and Treatment. 2020	-	-	-	Prevention of SARS-CoV-2: Isolation area and staff management, personal protection, hospital protocols and digital support	-
86	Chughtai AA, Seale H, *et al*. 2020	-	-	-	Regulation for face masks wear by healthcare professionals in hospitals	
87	Giwa AL, Desai A, *et al.* 2020	-	-	-	Epidemiological, preventive, immunological characteristics of COVID-19 pandemic	"Use of Personal Protective Equipment"
88	Leung NHL, Chu DKW, *et al.* 2020	-	-	-	Surgical masks in the transmission of SARS-CoV-2 and Influenza	-
89	Murthy S, Gomersall CD, *et al.* 2020	-	-	-	PPE for healthcare professional with or without aerosols (regarding the treatment of patients with COVID +)	-
90	Ng K, Poon BH, *et al.* 2020	41 healthcare professionals exposed to aerosols from patients with COVID +	Exposure of at least 10 min at a distance inferior to 2m	Wearing a surgical mask or N95 + Isolation and monitoring of symptoms	Healthcare professionals did not develop the disease. Negative COVID test	Case report
91	Wang Q, Yu C. 2020	-	-	-	Indications regarding different masks	

92	Chinese Center for Disease Control and Preventions	-	-	-	Key findings for the prevention of healthcare professionals against SARS-CoV-2	-
93	CDC 2019	-	-	-	Risk of doctors' exposure	-
94	Rimmer A. 2020	-	-	-	PPE in COVID patients +	-
95	Rombolà G, Hedemperger M, *et al.* 2020	-	-	-	Practical indications for the prevention and management/ handling of SARS-Cov-2, *experienced-based*	Extrapolation to COVID-19?
96	Krithikadatta J, Nawal RR, *et al.* 2020	-	-	-	Guideline of recommendations for the protection of the dentist in endodontic practice. Prevention of cross infection in the community	-
97	Cowling BJ, Aiello A. 2020	-	-	-	Epidemiology, preventive measures in the community to fight COVID-19 transmission/ spread	-
98	Leung LV, Chu DKW, *et al.* 2020	-	-	-	Surgical masks in the transmission of SARS-CoV-2	-
99	van Doremalen N, Bushmaker T, *et al.* 2020	-	-	-	Aerosol stability in sars-cov 1 and 2	-
100	DGS. 2020	-	-	-	Infection with SARS-CoV-2 (COVID19) — Collection, Transport and Processing of Hospital Waste.	Guideline no. 012/2020 of 19/03/2020.
101	WHO 2020	-	-	-	Guide to healthcare professionals	-
102	-	-	-	-	COVID-19: Infection, prevention	-
103	ECDC. 2020	-	-	-	Infection, preparation and preventive measures of COVID-19 health environments	-
104	Association of Occupational health Professionals in Healthcare (AOHP) 2020	-	-	-	Infection by aerosols	-
105	Verbeek JH, Rajamaki B, *et al.* 2019	1950 patients in a total of 17 surveys	21 interventions regarding full body PPEs, putting on and removing PPE; Compliance of healthcare professionals	PPEs How to put on and remove without self-contamination of healthcare professionals, assessing training methods of healthcare professionals to improve compliance	Breathable PPEs with low quality evidence, 2 pairs of gloves for PPE removal, face-to-face training show better results in self-contamination prevention	Potential extrapolation to Dental Medicine
106	Long Y, Hu T, *et al.* 2020	9171 patients in 6 RCTs	Effectiveness of N95 respirators	Effectiveness of surgical masks	N95 respirators are not associated to a lower risk of Influenza	Survey with Influenza
107	CDC. 2020	-	-	-	*Guidelines* to monitor risk in professional environments	
108	CAL/OSHA	-	-	-	Aerosol transmissible diseases	-
109	ECDC. 2020	-	-	-	*Guidelines* of criteria for wearing and removing PPE for the care of patients with suspected of confirmed SARS-CoV-2	-

110	ECDC. 2020	-	-	-	Necessary PPE to treat patients with suspected or confirmed infection with SARS-CoV-2	-
111	ECDC. 2020	-	-	-	Safe use of PPE during infectious patients' treatment	-
112	Tang JW, Li Y. 2006	-	-	-	Factors involved in the transmission of infections caused by aerosols and control of ventilation	-
113	Asadi S, Wexler As, *et al.* 2019	-	-	-	Aerosol emission during human speech	-
114	Sociedad Española de Patología Digestiva; Asociación Española de Gastroenterología. 2020	-	-	-	*General and particular guidelines* in endoscopy units during SARS-Cov-19 pandemic	Extrapolation to Dental Medicine
115	Chin AWH, Chu JTS, *et al.* 2020	-	-	-	Transmission of SARS-CoV-2 on surfaces	-
116	Moriarty LF, Plucinski, *et al.* 2020	-	-	-	Control of SARS-CoV-2: isolation on a ship and its importance to Public Healthcare	-
117	Ong SWX, Tan YK. 2020	3 symptomatic positive COVID-19 patients	Space and material cleaning	Sampling before and after decontaminatio n* tests were not performed in the 2 periods and the same places were not assessed	Effectiveness of correct cleaning ?!?!	Potential extrapolation to Dental Medicine office?
118	Jiang Y, Wang H, *et al,* 2020	-	-	-	Clinical data on hospital environment hygiene monitoring and medical staff protection during the 2019 coronavirus disease outbreak	-
119	Zayas G, Chiang MC, *et al.* 2012	45 participants	Voluntary cough (Assessment of distribution, accurate and dependent on time, of droplet size using a laser diffraction system)	-	Droplets smaller than 1 micron represent 97% of the total number of droplets contained in cough aerosol. Age, sex, height and body weight do not have a statically relevant effect no aerosol composition (size and number)	
120	Bourouiba L. 2020	-	-	-	Cloud and aerosol generation: transmission through respiratory tract - implications and how to prevent	-
121	Bentley CD, Burkhart NW, *et al.* 1994	-	-	-	Evaluating sprays and aerosol generation during dental procedures	-
122	Bennett AM, Fulford MR, *et al.*2000	-	-	-	Risk of exposure of dentists: disease transmission by aerosols generated in dental practice	-
123	Hokett, s. D., honey, j	-	-	-	Effectiveness of sensor protection	-
124	Swaminathan Y, Thomas J. 2013	-	-	-	Aerosols generated during dental procedure are the main source of infection in the office and the main aspect is to control the infection	-
125	Otter JA, Donskey C, *et al.* 2020	-	-	-	Survival of potential pandemic viruses on surfaces	-
126	Rutala, WA, Weber DJ, *et al.* 2019	-	-	-	*Guidelines* to disinfect and clean	-

127	Kampf G, Löffler H. 2003	-	-	-	Persistence of SARS-CoV-2 on inanimate surfaces	-
128	-	-	-	-	Portuguese Official Journal, air regulation	-
129	Standard ISO 7730/2005	-	-	-	Ergonomics of the thermal environment: Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices. Local thermal comfort criteria	-
130	Ijaz MK, Brunner AH, *et al.* 1985	-	-	-	Survival characteristics of SARS-CoV-2	-
131	Offner D, Floretti F, *et al.* 2016	-	-	-	Contamination of dental unit waterlines	-
132	Ji XY, Fei CN, *et al.* 2019	-	-	-	Bacterial contamination of dental unit waterlines	-
133	Lizzadro J, Mazzotta M, *et al.* 2020	-	-	-	Cross infection of waterlines at a dental unit	-
134	Desarda H, Gurav A, *et al,* 2014	-	-	-	This microbiological study about high volume evacuators in which their efficacy is only registered when they undergo modification	-
135	Avasthi A. 2018	-	-	-	High-volume evacuators to reduce aerosols in dental clinics	-
136	Van der Sluijs M, *et al.* 2016	-	-	-	Periodontal inflammation following non-surgical treatment	-
137	Jawade R. 2016	-	-	-	Efficacy of different liquids in dental aerosols	-
138	Sethi KS. 2019	-	-	-	CHX vs. Cinnamon extract to reduce viral load in aerosols	-
139	Agência Nacional de Vigilância Sanitária (Portuguese Sanitary Surveillance Agency)				Chart of Respiratory Protection against Biological Agents for Healthcare Workers	
140	3M	-	-	-	Description of FFP2, KN95, and N95 characteristics	-
141	Infarmed	-	-	-	Surgical masks vs. Respiratory Filtering Devices	Characteristic Description
142	CDC. 2017	-	-	-	Masks and Respirators	-
143	Kantor J. 2020	-	-	-	Lesions associated to PPEs	-
144	CDC 2002	-	-	-	Guideline to disinfect hands	-
145	Nejatidanesh F, Khosravi Z, *et al.* 2013	-	-	-	Risk of cross contamination of dentist's face: peri-nasal and peri-ocular areas are the most exposed areas. Facial protection recommendations	-
146	Caldeira D, David C, *et al.*, 2011	-	-	-	Scientific repository about skin antiseptics to prevent contamination in vein punctures.	-
147	Kamel C, McGahan L, *et al.* 2011	-	-	-	Scientific repository about techniques to prepare skin antiseptics - infection prevention	-
148	Samaranayake LP, Reid J, *et al.* 1989	-	-	-	The efficacy of rubber dam in controlling aerosol contamination	-
149	El-Din AMT, Ghoname NAEH. 1997	-	-	-	The use of rubber dam in pediatric dentistry	-

150	Al-Amad SH, Awad MA, *et al.* 2017	-	-	-	The effect of rubber dam on bacterial transmission control	-
151	CDC. 2020	-	-	-	*Guidelines* to prevent infections	-
152	Day CJ, Sandy JR, *et al.* 2006	-	-		Types of particles produced during dental practice treatments	-
153	Hu, T. 2007	-	-	-	Risk of hepatitis B transmission via dental handpieces in dental medicine	-
154	CDC. 2003	-	-	-	Cleaning and disinfection of rotary devices	-
155	Tuttnauer Team 2020	-	-	-	Sterilization of dental materials	-
156	CDC. 2020	-	-	-	*Provisional guidelines* to control and prevent infections in COVID-19 suspected or confirmed patients in health facilities	-
157	Hu, X. 2020	-	-	-	Heat inactivation of serum interferes with the immunoanalysis of antibodies to SARS-CoV-2	-
158	Colaneri M. 2020	-	-	-	Environmental contamination with SARS-CoV-2 in hospital environment	-
159	United States Environmental Protection Agency Washington, D.C. 20460 Office of Chemical Safety and Pollution Prevention List N	-	-	-	Online list of disinfectants to use against SARS-CoV-2	-
160	Dexter F, Parra MC, et al. 2020	-	-	-	Combined disinfection with disinfectants and UV lights	-
161	Haralur SB, Al-Dowah OS, *et al.* 2012	-	-	-	Effect of alginate chemical disinfection on bacterial colony counting	-
162	Azevedo MJ, Correia I, et al. 2019	-	-	-	Disinfection of addition silicone impressions	-
163	Richard A. Bass, K.D. Plummer, *et al.* 1992	-	-	-	The effect of surface decontamination on a dental cast	-
164	Soares, C.R. and M. Ueti, *et al.* 2001	-	-	-	Influence of different methods of disinfection on the physical properties of gypsum type IV and V	-
165	Pisulkar SK, Dahane T, *et al.* 2018	-	-	-	Effect of saliva contamination of dental casts in terms of bacterial colony counting	-
166	Da Silva FC, Kimpara ET, *et al.* 2008	-	-	-	Effectiveness of 6 disinfectants on removing biofilm from acrylic prosthetics	-
167	CDC. 2020	-	-	-	Sequence to remove PPE	-
168	CDC. 2019	-	-	-	Decontamination and reuse of masks/respirators	-
169	COEC. 2020	-	-	-	Urgent care in dental medicine	-
170	CDC. 2019	-	-	-	Ocular protection	-
171	CDC. 2019	-	-	-	Cleaning and disinfection	-

172	Auer R, Cornelli G, *et al.* 2020	-	-	-	Changing payment methods during SARS-CoV-2 pandemic	-
173	CDC. 2001	-	-	-	Sterilization and disinfection of dental instruments	-
174	Schwartz, A, *et al.* 2020	-	-	-	Decontamination and Reuse of N95	-
175	Hoffmann M, Kleine-Webber H, *et al.* 2020	-	-	-	Transmission routes of SARS-CoV-2	-
176	Wolfel R, Corman VM, *et al.* 2020	-	-	-	Virological analysis of SARS-CoV-2: RNA active replication	-
177	To K, Tsang O, *et al.* 2020	-	-	-	Viral load in oropharyngeal saliva samples	-
178	Liu L, Wei Q, *et al.* 2020	-	-	-	Transmission of SARS-CoV-2 in saliva	-
179	Xu H, Zhong L, *et al.* 2020	-	-	-	Expression of ACE2 receptor in epithelial cells of oral mucosa	-
180	Chinese Center for Disease Control and Preventions	-	-	-	Key findings for the prevention of healthcare professionals against SARS-CoV-2	-
181	Neher RA, Dyrdak R, *et al.* 2020	-	-	-	Future perspectives - impact of seasonal forcing on the disease	-
182	Dion M, AbdelMalik P, *et al.* 2015	-	-	-	Big Data in health	Future Perspectives
183	Hollander JE, Carr BG. 2020	-	-	-	Article about telemedicine	Include in future perspectives
184	Perry, DJ. 2007	-	-	-	Evidence Levels	-
185	Kirchhof, P. 2016	-	-	-	Classes of recommendations	-

Section 4 | *Articles Excluded*

Table 4 | *Articles Excluded*

Author (1st and 2nd), Year	Criterion	DOI/PMID
Kang L, Li Y *et al.* 2020	J	10.1016/S2215-0366(20)30047-X
Koh, D. 2020	J	10.1093/occmed/kqaa036
Tang B, Bragazzi NL, *et al.* 2020	J	10.1016/j.idm.2020.02.001
To KK, Tsang OT *et al.* 2020	A	10.1093/cid/ciaa149
Tay JY, Lim PL *et al.* 2020	A	10.1093/cid/ciaa179
Catton H. 2020	J	10.1111/inr.12578
Callisher C, Carroll D, *et al.* 2020	J	10.1016/S0140-6736(20)30418-9
Bouadma L, Lescure FX, *et al.* 2020	A	10.1007/s00134-020-05967-x
Ayittey FK, Ayttey MK *et al.* 2020	J	10.1002/jmv.25706
Chen Q, Liang M *et al.* 2020	J	10.1016/S2215-0366(20)30078-X
Kmietowicz Z. 2020	J	10.1136/bmj.m707
Imai H. 2020	J	10.1111/pcn.12995
Liu J, Liao X, *et al.* 2020	J	10.3201/eid2606.200239
Joob B, Wiwanitkit *et al.* 2020	J	10.1016/j.jhin.2020.02.016
Zhang S, Diao MY *et al.* 2020	J	10.1007/s00134-020-05977-9
Zhou P, Huang Z *et al.* 2020	A	10.1017/ice.2020.60
Xie J, Tong Z *et al.* 2020	A	10.1007/s00134-020-05979-7
Cao Y, Li Q *et al.* 2020	K	10.1111/acem.13951
Li X, Qian Y *et al.* 2020	A	10.1148/radiol.2020200661
Favre G, Pomar L, *et al.* 2020	E	10.1016/S1473-3099(20)30157-2
Lee IK, Wang CC, *et al.* 2020	J	10.1016/j.jhin.2020.02.022
Petersen E, Hui D, *et al.* 2020	J	10.1016/j.ijid.2020.02.052
Wang J, Zhou M, *et al.* 2020	J	10.1016/j.jhin.2020.03.002
Haines A, de Barros EF, *et al.* 2020	J	10.1016/S0140-6736(20)30735-2
Al-Tawfiq JA, Auwaerter PG, *et al.* 2019	J	10.1016/j.jhin.2018.05.021
Park SY, Lee JS, *et al.* 2019	H	10.1016/j.jhin.2018.09.005
Song Z, Xu Y, *et al.* 2019	J	10.3390/v11010059

Aldohyan M, Al-Rawashdeh N, *et al.* 2019	J	10.1186/s12879-019-3898-2
Mobaraki K, Ahmadzadeh J. 2019	J	10.1186/s12879-019-3987-2
Xie J, Hu Y, *et al.* 2019	J	10.1177/0046958019847865
Corman VM, Lienau J, *et al.* 2019	I	10.1007/s00108-019-00671-5
Hong J, Chen J, *et al.* 2019	J	10.3390/ijerph16193758
Zhao Y, Chen Z, *et al.* 2019	J	10.1007/s11596-019-2114-3
Wang P, Anderson N, *et al.* 2020	J	10.1093/clinchem/hvaa080
Li W, Zhou Q, *et al.* 2020	J	10.21037/apm.2020.02.33
Chen Q, Allot A, *et al. 2020*	J	10.1038/d41586-020-00694-1
Klompas M. 2020	J	10.7326/M20-0751
Adams JG, Walls RM. 2020	J	10.1001/jama.2020.3972
Zandifar A, Badrfam R. 2020	E	10.1016/j.ajp.2020.101990
Schwartz J, King CC, *et al.* 2020	J	10.1093/cid/ciaa255
Kwon KT, Ko JH, *et al.* 2020	J	10.3346/jkms.2020.35. e 123
Li Z, Ge J, *et al.* 2020	J	10.1016/j.bbi.2020.03.007
Chen C, Zhao B. 2020	J	10.1016/j.jhin.2020.03.008
Lynch C, Mahida N, *et al.* 2020	J	10.1016/j.jhin.2020.03.010
Rimmer A. 2020	J	10.1136/bmj.m1055
Stein R. 2020	J	10.1111/ijcp.13501
Golda A, Malek N, *et al.* 2011	E	10.1099/vir.0.028381-0
Scully C, Samaranayake LP. 2016	J	10.1111/odi.12356
Sukumaran A, Patil S	J	25095856
Kharma MY, Alalwani MS, *et al.* 2015	J	10.4103/2231-0762.159951
Ashok N, Rodrigues JC, *et al.* 2016	J	10.7860/JCDR/2016/17519.7790
Baseer MA, Ansari SH, *et al.* 2016	J	10.4317/jced.52811
Kim HJ, Ko JS, *et al.* 2020	J	10.4097/kja.20110
Calvo C, García López-Hortelano M, *et al.* 2020	A/F/H	10.1016/j.anpedi.2020.02.001
Mossa-Basha M, Meltzer CC, *et al.* 2020	J	10.1148/radiol.2020200988
Althomairy SA, Baseer MA, *et al.* 2018	J	10.4103/jispcd.JISPCD_9_18
Elrggal ME, Karami NA, *et al.* 2018	J	10.1007/s10389-018-0917-5

Gaffar BO, El Tantawi M, *et al.* 2019	J	10.15537/smj.2019.7.24304
Aminnejad R, Salimi A, *et al.* 2020	J	10.1007/s12630-020-01627-2
Oxford JS, Bossuyt S, *et al.* 2003	J	10.1046/j.1365-2567.2003.01684.x
Fang LS. 2003	J	14552214
Huber SJ, Wynia MK. 2004	J	10.1162/152651604773067497
Chang HJ, Huang N, *et al.* 2004	J	10.2105/ajph.94.4.562
Yu H, Sun X, *et al.* 2020	J	10.3390/ijerph17051770
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Li RW, Leung KW, *et al.* 2004	J	10.1038/sj.bdj.4811469
Testarelli L, D' Aversa L, *et al.* 2004	J	15278018
Galligan JM. 2004	J	15481238
Adhikari SP, Meng S, *et al.* 2020	A	10.1186/s40249-020-00646-x
Yip HK, Tsang PC, *et al.* 2007	J	17405470
Qian F, Lim MK. 2010	J	10.1007/s00038-009-0099-6
Holý O, Matoušková I. 2012	J	10.5114/wo.2012.29298
Iacobucci G. 2020	J	10.1136/bmj.m1097
Rimmer A. 2020	J	10.1136/bmj.m1099
Ebrahim SH, Ahmed QA, *et al.* 2020	J	10.1136/bmj.m1066
Kain NA, Jardine CG. 2020	J	32165480
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De Ceukelaire W, Bodini C. 2020	J	10.1177/0020731420916725.
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Rimmer A. 2020	J	10.1136/bmj.m1104
Tanne JH, Hayasaki E, *et al.* 2020	J	10.1136/bmj.m1090
Thomas-Rüddel D, Winning J, *et al.* 2020	I	10.1007/s00101-020-00758-x
Giovanetti M, Angeletti S, *et al.* 2020	J	10.1002/jmv.25773
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Ng Y, Li Z, *et al.* 2020	J	10.15585/mmwr.mm6911e1.
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Kwok YLL, Gralton J, *et al.* 2020	J	10.1016/j.ajic.2014.10.015
Wahba L, Jain N *et al.* 2020	B	10.1093/cid/ciaa149
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Jairaj A, Shirisha P, *et al.* 2018	C	10.4103/jispcd.JISPCD_347_18
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Liu K. 2020	J	10.1126/science.367.6484.1398
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Wang J, Xu C, *et al.* 2020	D/E	10.1016/S0140-6736(20)30561-4

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Hartmann-Boyce J, Mahtani K. 2020	J	https://www.cebm.net/COVID-19/supporting-people-with-long-term-conditions-ltcs-during-national-emergencies/
Health Protection Scotland 2020	J	https://www.hps.scot.nhs.uk/web-resources-container/COVID-19-guidance-for-first-responders-and-others-in-close-contact-with-symptomatic-people-with-potential-COVID-19/
Intensive Care medicine 2020	J	https://static1.squarespace.com/static/5e6613a1dc75b87df82b78e1/t/5e6d0530d0babc2b370bf29b/1584203289238/COVID-19_Airwayshort.pdf
Hartmann-Boyce J, Narthan D, *et al.* 2020	J	https://www.cebm.net/COVID-19/maximising-mobility-in-the-older-people-when-isolated-with-COVID-19/
Health Protection Scotland 2020	J	https://www.hps.scot.nhs.uk/web-resources-container/COVID-19-guidance-for-infection-prevention-and-control-in-healthcare-settings/
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Health Protection Scotland 2020	A	https://hpspubsrepo.blob.core.windows.net/hps-website/nss/2935/documents/1_COVID-19-guidance-for-hpt.pdf
Khunti K, Greenhalgh T *et al.* 2020	J	https://www.cebm.net/COVID-19/what-is-the-efficacy-of-eye-protection-equipment-compared-to-no-eye-protection-equipment-in-preventing-transmission-of-COVID-19-type-respiratory-illnesses-in-primary-and-community-care/
INTERIM ClínicaL GUIDANCE FOR ADULTS WITH SUSPECTED OR CONFIRMED COVID-19 IN BELGIUM Abril 2020	F	https://epidemio.wiv-isp.be/ID/Documents/Covid19/COVID-19_InterimGuidelines_Treatment_ENG.pdf
Ministry Of health ontario 2020	J	http://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/2019_primary_care_guidance.pdf
University of Oxford 2020	J	https://bjgplife.com/wp-content/uploads/2020/03/Video-consultations-a-guide-for-practice.pdf
He Knowledge and Library Services Team 2020	J	https://phelibrary.koha-ptfs.co.uk/coronavirusinformation/

Evidence Levels Adapted and translated from Perry, DJ, et al. 2007[184]

Level of Evidence	Descriptive
Level Ia	Evidence from systematic reviews or meta-analyses of randomized controlled trials
Level Ib	Evidence from, at least, one randomized controlled trial
Level IIa	Evidence from, at least, one well-designed non-randomized controlled trial
Level IIb	Evidence from, at least, one other type of quasi-experimental well-designed trial
Level III	Evidence from descriptive non-experimental well-designed trials, such as comparative studies, correlation studies and case studies
Level IV	Evidence from reports of expert committees or experiments performed by respected entities

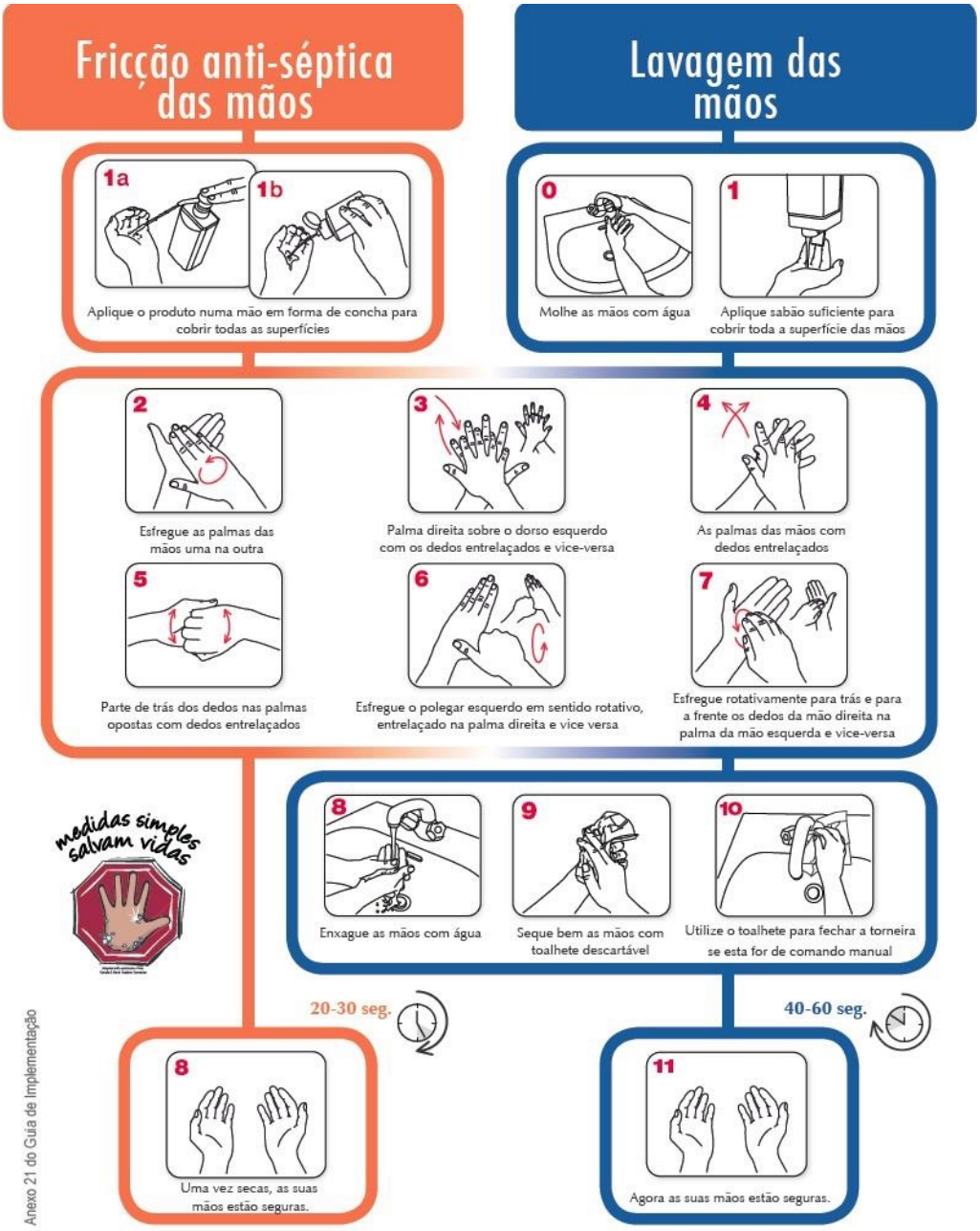
Classes of recommendation Adapted and translated from Kirchhof P, et al. 2016[185]

Class of recommendation	Descriptive	Indication
Class I	Evidence and/or general agreement that a given procedure or treatment is beneficial, useful, and effective	**Recommended/Indicated**
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment	
Class IIa	Evidence/opinion is in favor of usefulness/ efficacy	**Should be considered**
Class IIb	Usefulness/efficacy is less well established by evidence/opinion	**May be considered**
Class III	Evidence and/or general agreement that a procedure/treatment is not useful/effective and in some cases may be harmful	**Not recommended**

Appendix III

Support Material

Section 1 | Hand hygiene technique using an alcohol-base antiseptic solution (ABAS) or water and soap[84]



Put on PPE

Protection of degree 1 (for moderate risk level)	Protection of degree 2 (for high risk level)	Protection of degree 3 (for very high risk level)
1st Hand antisepsis; 2nd Adapt surgical mask and check if it is adjusted; 3rd Put on impervious gown; 4th Put on surgical cap or bouffant cap; 5th Hand antisepsis with an ABAS; 6th Put on well adapted gloves covering the gown.	1st Hand antisepsis; 2nd Adapt respirator and perform adjustment test; 3rd Put on impervious gown; 4th Put on disposable shoe-covers; 5th Hand antisepsis with an ABAS; 6th Put on goggles (if applicable); 7th Put on a surgical cap or surgical hood; 8th Put on facial shield (if applicable); 9th Put on well adapted gloves covering the gown; 10th Check if all the equipment is well adjusted.	1st Hand antisepsis; 2nd Adapt respirator and perform adjustment test; 3rd Put on impervious gown or impervious coveralls; 4th Put on disposable shoe-covers; 5th Hand antisepsis with an ABAS; 6th Put on a pair of gloves covering the gown/coverall: 7th Put on goggles (if applicable); 8th Put on hood of coverall or surgical gown; 9th Put on facial shield; 10th Disinfect inner gloves with ABAS; 11th Remove outer pair of gloves; 12th Check if all the equipment is well adjusted.

Removal of PPE

Protection of degree 1 (for moderate risk level)	Protection of degree 2 (for high risk level)	Protection of degree 3 (for very high risk level)
1st Remove impervious gown; 2nd Remove gloves together with the gown; 3rd Hand antisepsis with an ABAS; 4th Remove surgical cap or bouffant cap; 5th Remove surgical mask; 6th Hand antisepsis with an ABAS;	1st Remove impervious gown; 2nd Remove gloves together with the gown; 3rd Hand antisepsis with an ABAS; 4th Remove eye protection and cap/bouffant (from the back to the front); 5th Remove all shoe-covers: 6th Hand antisepsis with an ABAS; 7th Remove respirator; 8th Hand antisepsis with an ABAS;	1st Remove outer pair of gloves; 2nd Disinfect inner gloves with ABAS; 3th Remove eye protection and cap/bouffant (from the back to the front) or the hood of the coverall; 4th Remove the gown and simultaneously the inner pair of gloves; or remove the coverall and then the gloves; 5th Remove all shoe-covers: 6th Hand antisepsis with an ABAS; 7th Remove respirator; 8th Hand antisepsis with an ABAS;

70% Ethanol Solution

To obtain a 70% ethanol solution based on a 96% ethanol stock-solution, you need:

729,2 mL of ethanol at 96%

270,8 mL distilled water

0.1% Sodium Hypochlorite Solution

To obtain 1 L of 0.1% hypochlorite solution, based on a 5% hypochlorite solution stock-solution, you need:

20 mL of Sodium Hypochlorite at 5%

980 mL distilled water

0.5% Sodium Hypochlorite Solution

To obtain 1 L of 0.5% hypochlorite solution, based on a 5% hypochlorite solution stock-solution, you need:

100 mL of Sodium Hypochlorite at 5%

900 mL distilled water

1% Sodium Hypochlorite Solution

To obtain 1 L of 1% hypochlorite solution, based on a 5% hypochlorite solution stock-solution, you need:

200 mL of Sodium Hypochlorite at 5%

800 mL distilled water

0.2% Povidone-iodine Solution

To obtain 1L of 0.2% povidone-iodine solution based on a 10% povidone-iodine stock-solution, you need:

20 mL of 10% povidone-iodine

980 mL distilled water

1% Hydrogen Peroxide Solution

To obtain 1 L of 1% hydrogen peroxide solution, based on a 3% hydrogen peroxide solution stock-solution (equivalent to 10 volume Oxygenated Water), you need:

333.3 mL of 3% hydrogen peroxide

666,7 mL distilled water

1% Hydrogen Peroxide Solution

To obtain 1 L of 1% hydrogen peroxide solution, based on a 9% hydrogen peroxide solution stock-solution (equivalent to 30 volume Oxygenated Water), you need:

111 mL of 9% hydrogen peroxide

889 mL distilled water

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