

GUIDANCE FOR PROVIDING DENTAL SERVICES IN GOVERNMENTAL AND PRIVATE SECTORS DURING COVID-19 PANDEMIC

Table of Contents

1. Introduction	5
2. Purpose.....	6
3. Terms and Definitions	6
4. General Considerations.....	8
5. Infection Control Measures in Dental Settings during COVID-19 Pandemic	9
5.1 Dentist and Dental Team Preparation:	9
5.2 Dental Facility Preparation:	10
5.3 Respiratory Triage	10
5.3.1 Types of respiratory triaging applied for dental setting	10
5.3.1.1 Distant Triaging by Telephone (10).....	10
5.3.1.2 Triaging Upon Patient Arrival (Visual Triage).....	11
5.4 Universal Source Control Measures	11
5.5 Hand Hygiene	11
5.5.1 Pre-washing considerations.....	11
5.5.2 Types of hand washing.....	11
5.5.3 Indications for Hand Hygiene.....	12
5.5.4 Hand Hygiene Techniques	12
5.5.4.1 Hand Hygiene Technique with Alcohol-Based Formulation	12
(Appendix 1 & 2).....	12
5.5.4.2 Hand Hygiene Technique with Soap and Water.....	12
(Appendix 1 & 2).....	12
5.6 Personal Protective Equipment (PPE)	13
5.6.1 Recommended Sequences for Donning and Doffing PPE:	13
5.6.1.1 Donning:	13
5.6.1.2 After completion of dental care (Doffing):	13
5.7 Aerosol Generating Procedures in Dental Settings:	15
5.8 Enhancing of Physical Distancing:	15
5.9 Environmental Cleaning and Disinfection	16
5.10 Sterilization & Dental Laboratory	16
5.11 Recommended infection prevention and control (IPC) practices when providing dental healthcare for a patient with suspected or confirmed SARS-CoV-2 infection:	17
5.12 Additional Measures and Instructions	17
6. References	19
7. Appendices	20

Guidance for Providing Dental Services in Governmental and
Private Sectors during COVID-19 Pandemic

Summary of updates

The new updates and modifications that were done to this version (version 3), compared to the previous version (version 2) are summarized below:

No.	Page	Summary of changes
1	9	3. Terms and definitions: the following terms are removed; "AllR", "Emergent care", "Non-urgent dental care", and "Advice care".
2	13	5.1 Dentist and Dental Team Preparation: the recommended infection control measures are reduced to 11 items, instead of 16 items in version 2.
3	14	5.2 Dental Facility Preparation: This is a new subheading under "5. Infection Control Measures in Dental Settings during COVID-19 Pandemic", containing 9 items.
4	15	5.3 Respiratory triage: This is now summarized to be more concise and clearer.
5	16	5.4 Universal Source Control Measures: This is a new subheading under "5. Infection Control Measures in Dental Settings during COVID-19 Pandemic", containing 5 items.
6	18	5.6 Personal Protective Equipment (PPE): It is now edited to be summarized in 8 points to be more concise.
7	19	5.6.1 Recommended sequences for Donning and Doffing PPE: This is a new subheading.
8	20	Table 1. Required Personal Protective Equipment (PPE) by Setting and Procedure/Activity: This is a new table under "5.6 Personal Protective Equipment (PPE)"
9	22	5.7 Aerosol Generating Procedures in Dental Settings: This is a new subheading under "5. Infection Control Measures in Dental Settings during COVID-19 Pandemic".
10	23	5.8 Enhancing of Physical Distancing: This is a new subheading under "5. Infection Control Measures in Dental Settings during COVID-19 Pandemic", containing 6 points.
11	23	5.9 Environmental Cleaning and Disinfection: This is replacing the previous subheading "5.5 Cleaning and Disinfection" in version 2. Also, it is now modified and edited to be in 8 points.

12	24	5.10 Sterilization & Dental Laboratory: This is a new subheading replacing the previous subheading “5.6 Sterilization”
13	25	5.11 Recommended infection prevention and control (IPC) practices when providing dental healthcare for a patient with suspected or confirmed SARS-CoV-2 infection: This is a new subheading under “5. Infection Control Measures in Dental Settings during COVID-19 Pandemic”.
14	26	5.12 Additional measures and instructions: The items are reduced to 16 items, instead of 19 items in version 2.
15	-	Two subheadings were removed; “5.4 Air control” and “5.7 Engineering control”, from this version (3).

1. Introduction

Novel coronavirus (COVID-19) is a new and emerging infectious disease that is rapidly spreading worldwide and reported cases have grown impressively over time. Transmission of COVID-19 is likely to occur through direct contact with respiratory mucosa or conjunctivae primarily through respiratory droplets and secretion, either by direct exposure or by transfer on hands from contaminated surfaces. The current evidence does not support airborne transmission, except during aerosol-generating procedures (AGPs) (1-3). Due to the proximity of individuals during dental procedures and the generation of aerosols, dentists, staff, and patients are at high risk of transmission of COVID-19 (figure 1).

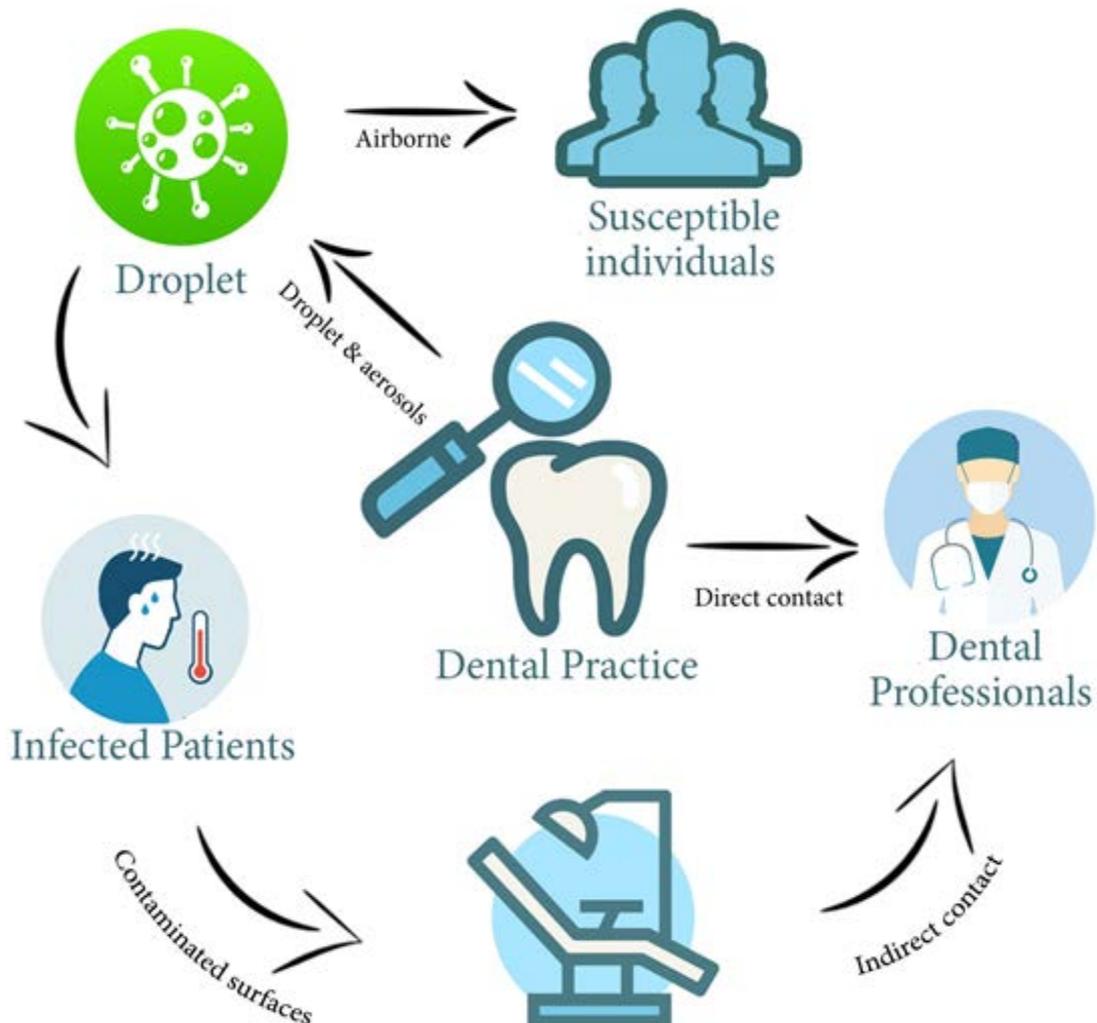


Figure 1. Illustration of transmission routes of COVID-19 in dental clinic

On March 20th, 2020, the Ministry of Health (MOH) restricted the governmental and private dental facilities to manage only the emergency/urgent dental care. In addition, “Dental Emergency Protocol during COVID-19 Pandemic” was issued by the General Directorate of Dentistry, (MOH) in collaboration with General Directorate of Infection Prevention and Control to facilitate the safest practice during the current pandemic. In its efforts to control the spread of COVID -19. The MOH started gradually some of its clinical and medical services for routine cases. The national epidemiological status of COVID -19 as well as the negative impact and consequences for delayed management cases were taken into consideration.

This guidance was issued to help all governmental and private dental health facilities and dental healthcare workers (DHWs) to provide their routine dental services during the era of COVID-19. It comes in line with other documents previously issued by the MOH and must be carefully read, understood, and applied. All relevant documents can be reached through the MOH website in conjunction with other instructions, which can be found on the Ministry’s website.

<https://www.moh.gov.sa/Ministry/MediaCenter/Publications/Pages/covid19.aspx>

The (manual of Infection Prevention & Control in Dental settings, 2nd edition) can be downloaded through the link

<https://www.moh.gov.sa/Ministry/MediaCenter/Publications/Documents/2018-11-22-005.pdf>

2. Purpose

This document targets all dental facilities, clinics, and DHWs working in the governmental or private sector in Saudi Arabia. The guidance is based on the best latest available scientific evidence and will be reviewed periodically according to the recommendations and updates of the MOH and relevant authorities, and according to the epidemiological status of the virus outbreak. The overall goals are to provide necessary instructions and guidelines for the management of safe routine dental care during COVID-19 pandemic in Saudi Arabia.

3. Terms and Definitions

HVAC System: Heating, ventilation, and air conditioning system.

Neutrally air-ventilated room: This is a room that contains an air conditioner or naturally ventilated. It has not been intentionally designed with a unidirectional airflow as a positive or negative pressure.

HEPA Filter: High-efficiency particulate air (HEPA), also known as high-efficiency particulate absorbing and high-efficiency particulate.

Common standards require that a HEPA air filter must remove—from the air that passes through—at least 99.95% (European Standard) or 99.97% (ASME, U.S. DOE) of particles equal to 0.3 μm ; with the filtration efficiency increasing for particle diameters both less than and greater than 0.3 μm .

PAPR: Powered air-purifying respirator is a battery-powered blower that provides positive airflow through a filter, cartridge, or canister to a hood or facepiece. The type and amount of airborne contaminant will dictate the type of filter, cartridge or canister required for the PAPR (4). It is used by those who failed the respirator size determination test, cannot find a fit-tested respirator or who have a beard.

Aerosols: A mixture of different sizes of particles which are differentiated as splatter ($> 50 \mu\text{m}$), droplet ($\leq 50 \mu\text{m}$), and droplet nuclei ($\leq 10 \mu\text{m}$). Most of the aerosols produced in dentistry are extremely small (0.5 to 5 μm). Inhalation of these small particles inflicts infectious hazards for DHWs (5-7).

Aerosol-Generating Procedures (AGPs): A procedure capable of generating hazardous droplet nuclei ($\leq 10 \mu\text{m}$). AGPs have been associated with increased risk of transmission of viruses (e.g., SARS-CoV and MERS-CoV) such as nasopharyngeal swabbing, the use of dental handpiece and ultrasonic handpiece, tracheal intubation, non-invasive ventilation, tracheotomy, and cardiopulmonary resuscitation.

Standard Precautions: Are a set of infection control practices used to prevent transmission of diseases that can be acquired by contact with blood, body fluids, non-intact skin (including rashes), and mucous membranes (8). Standard Precautions include:

- 1- Hand hygiene
- 2- Use of personal protective equipment (e.g., gloves, masks, eyewear)
- 3- Respiratory hygiene/cough etiquette
- 4- Sharps safety (engineering and work practice controls) & waste management
- 5- Safe injection practices (i.e., aseptic technique for parenteral medications)
- 6- Sterilization of instruments and devices
- 7- Cleaning and disinfection of environmental surfaces

Transmission-Based Precautions: Measures to be used in addition to Standard Precautions for patients who may be infected or colonized with specific infectious agents for which these additional precautions are needed to prevent infection transmission (8).

Clinical contact surfaces: Are touched frequently with gloved hands during patient care, or may become contaminated with blood, saliva, or other potentially infectious material and then encounter instruments, devices, hands, or gloves (9).

Housekeeping surfaces: (e.g., floors, walls, and sinks) do not encounter hands or devices used in dental procedures. Proper treatment of clinical contact surfaces is required before they become involved in the care of the next patient (9).

GDIPC: General Directorate of Infection Prevention and Control.

BICSL: Basic Infection Control Skills License

Urgent dental care: It focuses on the management of severe or uncontrolled symptoms that cannot be managed by the patient and require the patient to be seen by a dentist in a dental care center/clinic.

4. General Considerations

1. For all dental procedures, DHWs should consider the risk factors associated with demographics, general health, and medical history. Consideration should be given to delaying non-essential procedures to older otherwise healthy adults (65+) and medically compromised patients.
2. When performing assessment to the patient, consider the patient and staff safety, prioritization of the previously scheduled appointments, urgent care needs, professional judgment, patient's preference, and **the availability of the supply for the dental care centers**.
3. Dentists should exercise professional judgment and carefully consider the risks of the disease transmission. However, the possible risks should be considered against any benefit to the patient, the DHWs, and the community.
4. Provide appropriate clinical judgment on pharmaceutical management and follow-up as needed. MOH E-prescription services can help to dispense medication from the commercial pharmacies.
5. Patients are encouraged to maintain proper oral hygiene by consuming a healthy diet, avoid hard or sticky food, and keep good oral hygiene practices to preserve their status.
6. Patients may be asked to wait in their cars or outside the facility until they are asked to come in, if the waiting areas can't accommodate a large number of patients with the application of physical distancing.
7. DHWs should continuously update their relevant knowledge and guidelines related to COVID-19.
8. The leadership should arrange with the designated healthcare facility to provide all occupational health services for the dental staff.

5. Infection Control Measures in Dental Settings during COVID-19 Pandemic

Infection control measures during the COVID-19 pandemic must be accompanied by all standard precautions in a normal situation. These include hand hygiene, Personal Protective Equipment, their sequence of donning and doffing, covering high touchable clinical and housekeeping surfaces, utilization of high-volume suction and saliva ejector, flushing the dental lines and all others which are offered in previous local policies and guidelines (please refer to The GDIPC's manual of infection prevention and control for dental settings).

In this guideline, additional infection control measurements are explained and obligated in the presence of COVID-19 to prevent cross-infection to/from DHWs.

Recommended infection prevention and control (IPC) practices for routine dental healthcare delivery during the pandemic

5.1 Dentist and Dental Team Preparation:

1. All dental health care facilities/clinics must operate to maintain safety and prevent infection for patients, the public, and practitioners which is the top priority.
2. Staff preparation and education is an absolute must. An assessment of staff concerns and ability to adhere to these guidelines is a priority. Enough training in this regard must be carefully provided, evaluated, and guaranteed.
3. Each facility must make sure that all DHWs are familiarized with the relevant MOH guidelines and protocols.
4. Ensure that the infection control guidelines of housekeepers are strictly followed and monitored. If necessary, arrangements and coordination with the cleaning and maintenance companies must also be made to guarantee their adherence to the guidelines in this aspect.
5. DHWs are advised to limit the number of staff in the practice at one time.
6. DHWs are advised to stagger shifts and lunch/coffee breaks when possible to support physical distancing.
7. All DHWs and all other employees must be screened daily before the entrance with measuring body temperature.
8. All DHWs and all other employees should be self-monitored for the emerging of fever, cough, and shortness of breath.
9. DHWs and all other employees experiencing any of these signs (fever $\geq 38^{\circ}\text{c}$ / cough/ sore throat/ shortness of breath) should not come to work and must report to the healthcare facility/provider to seek medical care. The affected staff can contact either **employee health clinics** or use e-services such as **Sehaty, Tetamman** and if necessary, call 937 for further instructions.
10. When DHWs are confirmed to have COVID-19, they must follow the recommendation of the employee health clinic (MOH guidelines) concerning the resume of their work.

11. Because clothing worn in the dental clinic can become contaminated with COVID-19, dentists and DHWs must change into work clothes (e.g. scrubs) and footwear immediately upon reporting to work. Clothes worn in the clinic must not be worn outside of the clinic.

5.2 Dental Facility Preparation:

1. All dental facilities should limit points of entry into the facility (e.g., by designating a single entrance door).
2. Screen everyone entering the dental healthcare facility for fever, screening area for staff, patients, and their companions at the facility entrance should be established and asking everyone to wear his facemask and practice alcoholic hand rub.
3. All dental facilities are encouraged to use electronic payment methods whenever possible and avoid cash payment at the present and future time.
4. All precautions and guidelines regarding the use and disinfection of elevators and other facility areas must be strictly monitored and followed.
5. To avoid viral cross-contamination, remove all unnecessary items from the work surfaces in the clinics and ensure all equipment, materials and disposable items in sight should be minimized to only that which is strictly necessary.
6. Remove magazines, reading materials, toys, and any non-essential furniture (other than chairs) that may be touched by others and which are not easily disinfected. Place a transparent barrier in front of the check-in desk. Arrange chairs to optimize physical distancing of at least 1.5-2 m.
7. The patient waiting areas should have chairs that are separated by 1.5-2 meters, alcohol dispensers, tissues touchless waste container and signs or media screens for cough etiquette and hand hygiene techniques.
8. DHWs should be asked to maintain physical distancing of at least of 1.5-2 meters except as required to provide patient care.
9. Post visual alerts (e.g., signs, posters) at the entrance and in strategic places (e.g., waiting areas, elevators) to provide instructions (Arabic & English) about how and when to perform hand hygiene, respiratory hygiene and cough etiquette and Instructions for wearing a cloth/ medical facemask for source control.

5.3 Respiratory Triage

The goal of respiratory triage is to identify persons with a potential respiratory infection and thus reduce the chance of spreading the infection inside the facility and through the community.

5.3.1 Types of respiratory triaging applied for dental setting

5.3.1.1 Distant Triaging by Telephone (10)

1. In case the patient called the dental clinic for an appointment; dentist or well-trained dental personnel will fill the triage form for COVID-19 and evaluate the patient if he needs clinical advice/pharmacological management.
2. Instruct the patient who have fever or respiratory symptoms to visit hospital ER or call 937 for further evaluation or treatment is required.

5.3.1.2 Triage Upon Patient Arrival (Visual Triage)

1. Trained dental assistant /dentist will perform visual triage and the patient will be asked if he/she has any respiratory symptoms (11)
2. Fever in the absence of respiratory symptoms could be associated with an emergency or urgent dental condition (e.g., dental infection) if dental settings are to be used (10-12).
3. Inform the patients that companions are not allowed to attend the dental visit except for instances where the patient requires assistance (e.g., pediatric patients, people with special needs, elderly patients, etc.). If companions are allowed for patients receiving treatment, they should also be triaged for signs and symptoms of COVID- 19 during patient check-in.

5.4 Universal Source Control Measures

1. Patients and visitors should, ideally, wear their own facemask covering upon arrival to and throughout their stay in the facility.
2. Patients may remove their facemask covering when in dental treatment room but should put it back on when leaving at the end of the dental treatment.
3. Facemasks and cloth face coverings should not be placed on young children under age 2.
4. DHW should wear a surgical face mask all times while they are in the dental setting, including in breakrooms or other spaces where they might encounter co-workers.

5.5 Hand Hygiene

Hand hygiene is extremely important to prevent the spread of the SARS CoV-2 virus. It also interrupts the transmission of other viruses and bacteria, thus reducing the overall burden of disease, Dental healthcare facilities should ensure that hand hygiene supplies are readily available in every patient care location.

5.5.1 Pre-washing considerations

- 1- Remove jewelry, ring, watches, or bracelets
- 2- Remove artificial nails if present.
- 3- Cover skin cuts, abrasions, breaks or cracks with waterproof adhesive dressings.
- 4- Use running water; avoid dipping or washing hands in a basin of standing water.

5.5.2 Types of hand washing

- 1- Routine hand washing: washing hands with plain (i.e., non-antimicrobial) liquid soap and water.
- 2- Antiseptic Hand Wash: Washing hands with antimicrobial soap and water for any surgical (aseptic) procedure.

- 3- Alcohol-based hand rub: An alcohol-containing preparation (60% at least) designed for application to the hands to reduce the number of viable microorganisms on the hands.
- 4- Surgical hand antisepsis. For more details, please refer to GDIPC's Manual of Infection Prevention and Control for Dental Settings, 2018.(13) <https://www.moh.gov.sa/Ministry/MediaCenter/Publications/Documents/2018-11-22-005.pdf>

5.5.3 Indications for Hand Hygiene

1. Before and after all patient contact, contact with potentially infectious material, and before putting on and after removing personal protective equipment (PPE), including gloves.
2. Wash hands with soap and water when visibly dirty or visibly soiled or after using the toilet.
3. If exposure to potential spore-forming pathogens is strongly suspected or proven, hand washing with soap and water is mandatory.
4. Use an alcohol-based hand rub as the preferred means for routine hand antisepsis in all other clinical situations if hands are not visibly soiled.

5.5.4 Hand Hygiene Techniques

5.5.4.1 Hand Hygiene Technique with Alcohol-Based Formulation

(Appendix 1 & 2)

- A. Duration of the entire procedure: 20 seconds at least.
- B. Apply a palm full of alcohol-based hand rub and cover all surfaces of the Hands
- C. Rub hands palm to palm
- D. Right palm over left dorsum with interlaced fingers and vice versa
- E. Palm to palm with fingers interlaced
- F. Backs of fingers to opposing palms with fingers interlocked
- G. Rotational rubbing of left thumb clasped in right palm and vice versa

5.5.4.2 Hand Hygiene Technique with Soap and Water

(Appendix 1 & 2)

- A. Duration of the entire procedure: 40-60 seconds
- B. Wet hands with water
- C. Apply enough soap to cover all hand surfaces
- D. Rub hands palm to palm
- E. Right palm over left dorsum with interlaced fingers and vice versa
- F. Palm to palm with fingers interlaced
- G. Backs of fingers to opposing palms with fingers interlocked
- H. Rotational rubbing of left thumb clasped in right palm and vice versa
- I. Rinse hands with water.
- J. Dry hands thoroughly with a single-use paper towel
- K. Use towel to turn off faucet

5.6 Personal Protective Equipment (PPE)

1. PPE is specialized clothing worn by an employee for protection against a hazard (e.g., gloves, masks, protective eyewear, and gowns). It is crucial for the protection of DHWs versus infection (table 1).
2. In general conditions, the protection against aerosolized droplet nuclei is not recommended.
3. DHWs should wear surgical mask, eye protection (goggles or face shield that covers the front and sides of the face), yellow protective gown, and gloves during procedures likely to generate splashing or spattering of blood or other body fluids.
4. The GDIPC's manual of infection prevention and control for dental settings provides information on the PPE and its use in dentistry.
5. However, the respirator/ PAPR, along with the rest of other PPE, is mandatory during recovery from COVID-19 pandemic when aerosol-generating procedures should be performed and could not be avoided **for COVID-19 suspected or confirmed patients (use the updated definition of suspected and confirmed COVID-19 case published in the Saudi CDC 15)**
6. Fit testing and appropriate training to use the respirators should be documented and trainees must be given cards to remind them of the appropriate size for each one of them. The previous information is mainly available in the basic infection control skill license (BICSL) training program, which is provided at the infection control office of each hospital. If the facility does not offer BICSL training, please contact the local/regional infection control office.
7. Respirators should be certified as surgical respirator or face shield should be used with the respirator.
8. N95, FFP2 and KN95 are approved respirators by MOH (14)

NB:

- 1- ***PPE must be removed regularly inside the clinic except for respirators, which should be taken off outside the clinic and disposed of in an infectious medical-waste basket (yellow bag) (15).***
- 2- ***Extended use policy for respirator policy should not be applied in dental settings.***

5.6.1 Recommended Sequences for Donning and Doffing PPE:

5.6.1.1 Donning:

1. Perform hand hygiene.
2. Put on clean protective gown
3. Put on surgical mask or respirator.
4. Put on eye protection (goggles or a face shield).
5. Put on clean non-sterile gloves.

5.6.1.2 After completion of dental care (Doffing):

1. Remove gloves.
2. Remove protective gown.
3. Perform hand hygiene.
4. Remove eye protection.
5. Remove and discard surgical mask or respirator.
6. Perform hand hygiene.

Table 1. Required Personal Protective Equipment (PPE) by Setting and Procedure/Activity

Setting	Procedure/ Activity	Type of PPE
Treatment Area	Non-aerosol generating procedures (NAGPs) in normal patients i.e. non- suspected or confirmed COVID-19.	<ul style="list-style-type: none"> • Surgical mask • Gloves • Eye protection OR face shield
	Non-aerosol generating procedures (NAGPs) in suspected or confirmed COVID-19 patient	<ul style="list-style-type: none"> • Surgical mask • Gloves • Googles OR face shield • Protective gown
	Aerosol generating procedures (AGPs) in normal patient	<ul style="list-style-type: none"> • Respirator (fit-tested, seal-checked) OR Surgical mask • Gloves • Eye protection OR face shield • Protective gown
	Aerosol generating procedures (AGPs) in suspected or confirmed COVID-19 patient.	<ul style="list-style-type: none"> • respirator (fit-tested, seal-checked) • Gloves • Eye protection OR face shield • Protective gown
Treatment Area	Cleaning and disinfection of operatory or treatment area	<ul style="list-style-type: none"> • Surgical mask • Gown • Gloves • Eye protection
Reprocessing Area	Reprocessing of reusable instruments	<ul style="list-style-type: none"> • Surgical mask • Heavy duty utility-gloves • Eye protection or face shield • Protective gown
Reception	Reception duties	<ul style="list-style-type: none"> • Surgical mask • physical barrier • Maintain physical distancing
Staff Areas	Administrative and other tasks	<ul style="list-style-type: none"> • Surgical mask • Maintain physical distancing

5.7 Aerosol Generating Procedures in Dental Settings:

- A. Ultrasonic and sonic scalers, high-speed dental hand pieces (tooth preparation with air abrasion, air turbine hand piece), air polishers, and air-water syringes are considered the common Aerosol Generating Procedures during dental care.
- B. **Strategies to reduce transmission risk include:**
1. Avoidance or minimization of certain procedures that may increase risk of aerosol generation where possible, such as ultrasonic instrumentation.
 2. Prioritize use of techniques that decrease risk of aerosolization (e.g., manual instrumentation, low-speed hand pieces, instruments without water spray, etc.) as possible as you can.
 3. Use of high-volume evacuation/suction and dental rubber dams to minimize droplet, spatter, and aerosols
 4. High Volume Suction / Evacuation The effectiveness of high-volume suction in reducing aerosol release has been mainly tested, high volume evacuation during ultrasonic instrumentation resulted in reduction of particulates by 90-93% (16).
 5. Dental/Rubber Dams Use of a rubber dam eliminates virtually all contamination arising from saliva or blood. If a rubber dam is used, the only remaining source for airborne contamination is from the tooth that is undergoing treatment. This will be limited to airborne tooth material and any organisms contained within the tooth itself. Rubber dam usage reduces microbial contamination at the primary source by 90%-98% (17).

N.B. during Aerosol Generating Procedures the Use of high-volume evacuation/suction and dental rubber dams to minimize greatly droplet, spatter, and aerosols and then surgical mask and face shield could be used.

5.8 Enhancing of Physical Distancing:

1. Limiting visitors to the facility to those essential for the patient's physical or emotional well-being and care (e.g., care partner, parent).
2. Encourage use of alternative mechanisms for patient and visitor interactions such as video-call applications on cell phones or tablets.
3. Scheduling appointments to minimize the number of people in the waiting room.
4. Patients encouraged to wait in a personal vehicle or outside the dental facility where they can be contacted by mobile phone when it is their turn for dental care.
5. Minimize overlapping dental appointments.
6. Arranging seating in waiting rooms so patients can sit at least 1.5-2 meter apart

5.9 Environmental Cleaning and Disinfection

1. Environmental surfaces can be divided into clinical contact surfaces and housekeeping surfaces
2. After performing any dental procedure during the COVID-19 pandemic, a thorough terminal cleaning and disinfection should be done for the whole housekeeping and clinical surfaces.
3. Clinical contact surfaces can be directly contaminated from patient materials either by direct spray or spatter generated during dental procedures or by contact with DHCP's gloved hands.
4. Barrier protection of surfaces and equipment can prevent contamination of clinical contact surfaces.
5. Clinical surfaces should be wiped utilizing hospital-level disinfecting wipes (wipe-discard-wipe technique) or a spray-wipe-spray technique with hospital-level disinfection spray and non-woven cloth.
6. Full PPE with surgical masks during cleaning and terminal disinfection is extremely important to maintain the safety and protection of the person performing the process.
7. Surfaces should be cleaned and disinfected between patients by using approved hospital intermediate-level disinfectant). Some of the recommended disinfectants in the literature are shown in (table 2) (18).
8. Manufacturer's recommendations regarding the concentration and contact time should be followed.

Please refer to the GDIPC's Manual of Infection Prevention and Control for Dental Settings for more elaboration on the cleaning and disinfection steps and techniques.

Table 2. Recommended Disinfectants for SARS CoV-2

Disinfectant	Concentration
Ethanol (Ethyl Alcohol)	62%–71%
Hydrogen peroxide	2-5 %
*5% sodium hypochlorite (50,000 ppm chlorine)	0.1% (1,000 ppm chlorine) 1 measure 5% sodium hypochlorite to 49 measures water
Quaternary ammonium compounds (4 th generation)	

*Attention should be taken as this concentration can be corrosive to the metallic surfaces.

5.10 Sterilization & Dental Laboratory

1. There is no special recommendation for the sterilization and dental lab work processes during COVID-19 pandemic.
2. The standard IPC measures during procedure for both should be followed as usual.

5.11 Recommended infection prevention and control (IPC) practices when providing dental healthcare for a patient with suspected or confirmed SARS-CoV-2 infection:

- A. Surgical procedures that might pose higher risk for SARS-CoV-2 transmission if the patient has COVID-19 include those that generate potentially infectious aerosols
- B. Suspected or confirmed COVID-19 patients should be avoided from any non-emergency dental procedures and postponed until cleared.
- C. In case of emergency dental procedure and the procedure could not be delayed, the following measures must be applied:
 1. Dentists should require patients to rinse with an appropriate oral rinse for 60 seconds prior to examination of the oral cavity (examples include 1% povidone iodine or 1% - 1.5% hydrogen peroxide). (19)
 2. When possible, dentists should minimize the use of intra-oral radiographs and consider using extra-oral radiographs.
 3. Dentists must avoid AGPs whenever possible and use the lowest aerosol-generating options when necessary.
 4. Use of high-volume evacuation/suction and dental rubber dams should be mandatory and not optional in case of AGPs.
 5. In case on non-avoidable AGPs, DHWs should wear a certified fit tested respirator /PAPR (or surgical facemask if a respirator is not available), gown, gloves, and eye protection, the number of DHWs present during the procedure should be limited to only those essential for patient care and procedure support, visitors should not be present during the procedure and if available portable high-efficiency particulate air HEPA filter could be used near the patient's chair, but not behind the DHW, Ensure the DHW are not positioned between the unit and the patient's mouth.
 6. After AGP in dental treatment, the DHWs must maintain proper ventilation before the terminal cleaning & disinfection and utilization of the dental clinic for another patient.
 7. Following an aerosol-generating procedure (AGP) DHWs must wait 15 - 30 minutes following completion of the clinical care and exit of the patient and all clinical staff before cleaning and disinfection, Delaying the process of terminal cleaning and disinfection is mandatory before re-using the same treatment room in order to allow the HVAC system, the portable HEPA filter or the natural ventilation to remove the aerosols since the air remains contaminated after the dental procedure (12-19).
 8. As possible, DHWs included in high risk group for COVID-19 infection should be restricted from dental care procedures with suspected or confirmed COVID-19 patients.

5.12 Additional Measures and Instructions

- 1- Once an aerosol producing procedure is started, every effort should be made to take that procedure to completion. Upon completion, disposable PPE should be disposed of within that operatory in yellow bags. PPE that is reusable should be left in the operatory and disinfected along with the operatory or sterilized. Consideration should be given to utilizing two operatories if possible. Disinfect the operatory upon completion of the procedure allowing it to set while the other operatory is in use. Disinfect again before reusing.
- 2- When going home after a workday, DHWs should change from scrubs and shoes to personal clothing before returning home.
- 3- For COVID-19 suspected or confirmed patients any extra-oral radiograph such as panoramic radiographs or cone beam CT better to be delayed, if mandatory let the patient perform hand hygiene and wear surgical mask, the x-ray technician has to wear full PPE (Gown, Surgical

Mask, Goggles/Face Shield and clean gloves) and follow proper cleaning and disinfection of radiology department. Follow the link for more information:

[MOH Radiology Departments Preparedness Plan for COVID-19 V1.0](#)

- 4- If your mask is damaged or soiled, or if breathing through the mask becomes difficult, you should remove the face mask, discard it safely, and replace it with a new one.
- 5- Anti-retraction functions of handpieces may provide additional protection against cross-contamination through the water line.
- 6- DHWs should be aware that in certain situations, when a patient closes his mouth on saliva ejector, backflow could occur, and this backflow can be a potential source of cross-contamination.
- 7- DHWs should use resorbable sutures when possible (i.e., sutures that last 3 to 5 days in the oral cavity) to eliminate the need for a follow up appointment.
- 8- DHWs should minimize the use of a 3-in-1 syringe as this may create droplets due to forcible ejection of water/air.
- 9- DHWs should adhere to the standard sequence of donning and doffing of PPE.
- 10- There are no clinical studies supporting the virucidal effects of any preprocedural mouth rinse against SARS CoV-2, however it is recommended to be used due to its long-lasting antibacterial activity with a broad-spectrum of action. Pre-procedural rinse shows a decrease in viral load of SARS CoV-2 in in-vitro studies.
- 11- If suspected unintentional exposure, first aid must be done:
 - A- Remove contaminated clothing (if necessary).
 - B- Irrigate the affected area with copious amounts of water (10 minutes).
 - C- Reporting to the infection control department for guidance or Call (937).

Follow MOH guidelines for Coronavirus-Disease-2019-Guidelines (15) in the event of suspected unintentional exposure (e.g., unprotected direct contact with secretions or excretions from the patient). Follow the link for more information:

https://drive.google.com/folderview?id=1AoY43GmFt0cSq8qPYfhk-H9Nte_7jzfo

- 12- In case of multiple confirmed COVID-19 among DHWs in the facility, refer to the outbreak management recommendation in the link below:

<https://drive.google.com/drive/folders/1TeF-3sAyJRmZVZSWWhfviWJm0jCUXsesK?usp=sharing>

- 13- As the pandemic progresses, some patients will recover from the COVID-19 infection. The patient should have a written document from the hospital that he has recovered from COVID-19 to receive regular dental treatment.
- 14- DHWs must follow the proper practice for cleaning and disinfection for impressions and impression trays as mentioned in the Manual of Infection Prevention & Control in Dental Settings.
- 15- Considering the controversy regarding whether ibuprofen should be used for patients with a COVID-19 infection, it is recommended to use ibuprofen as normally indicated when managing any type of pain. For example, for the management of pulpal- and periapical-related dental pain and intraoral swelling in immune-competent adults, it is recommended that NSAIDs in combination with acetaminophen (i.e. 400-600 milligrams ibuprofen plus 1,000 mg acetaminophen) can still be used.
- 16- To measure the compliance of your dental facility regarding this guidance, please find the pre-constructed auditing forms in the link below:

https://drive.google.com/drive/folders/1MxFvMLL7k4cmWf5jQ_V10iSofZEqr5eE?usp=sharing

6. References

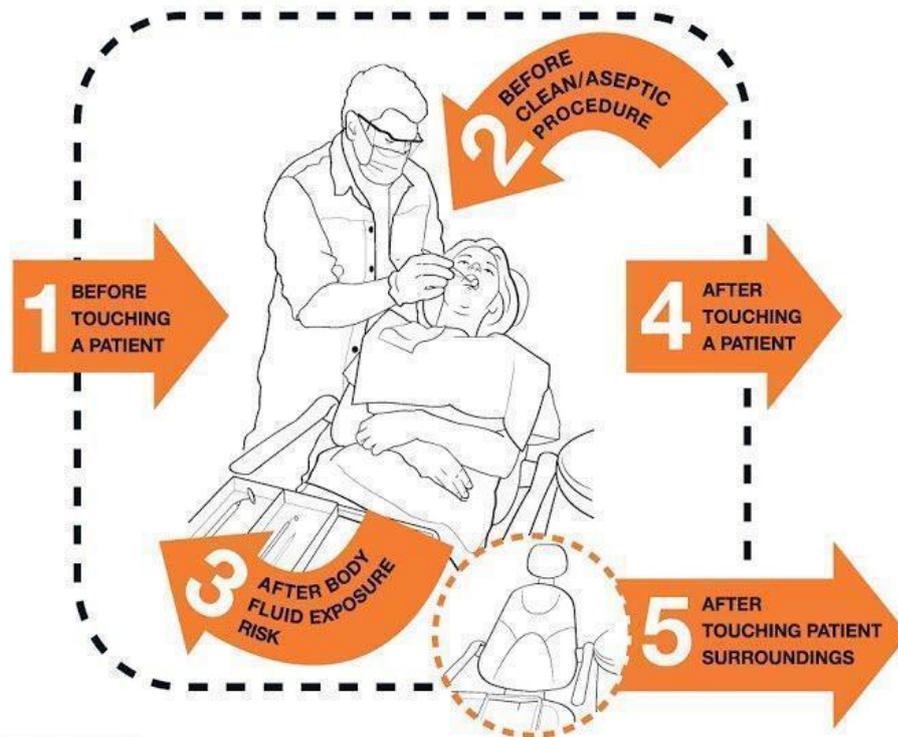
1. Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus Disease 19 (COVID-19): Implications for clinical dental care. *Journal of Endodontics*. 2020.
2. Su J. [Aerosol transmission risk and comprehensive prevention and control strategy in dental treatment]. *Zhonghua Kou Qiang Yi Xue Za Zhi*. 2020;55(0):E006.
3. Wu D, Wu T, Liu Q, Yang Z. The SARS-CoV-2 outbreak: what we know. *Int J Infect Dis*. 2020.
4. Nancy Bollinger MS. NIOSH Respirator Selection Logic. In: Services USDoHaH, editor. DHHS (NIOSH) Publication: NIOSH Publications Dissemination; 2004.
5. Harrel SK, Molinari J. Aerosols and splatter in dentistry: a brief review of the literature and infection control implications. *Journal of the American Dental Association* (1939). 2004;135(4):429-37.
6. WHO Guidelines Approved by the Guidelines Review Committee. In: Atkinson J, Chartier Y, Pessoa-Silva CL, Jensen P, Li Y, Seto WH, editors. *Natural Ventilation for Infection Control in Health-Care Settings*. Geneva: World Health Organization World Health Organization.; 2009.
7. James R, Mani A. Dental Aerosols: A Silent Hazard in Dentistry! *Int J Sci Res*. 2016;5:1761-3.
8. Siegel JD, Rhinehart E, Jackson M, Chiarello L, Committee HCICPA. 2007 guideline for isolation precautions: preventing transmission of infectious agents in health care settings. *American journal of infection control*. 2007;35(10):S65.
9. Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. *Guidelines for infection control in dental health-care settings-2003*.
10. ADA_Int_Guidance_Mgmt_Emerg-Urg_Dental_COVID19.pdf.
11. Ministry of Health. (2020). Wegaya COVID 19 Coronavirus Disease Guidelines. Retrieved from <https://covid19.cdc.gov.sa/wp-content/uploads/2020/05/COVID-19-Coronavirus-Disease-Guidelines-en.pdf> [Accessed on 29 September 2020].
12. The Association for Professionals in Infection Control and Epidemiology; 2014. p. Chapter 18 – Isolation Precautions, page 4/3.
13. Ministry of Health. (2018). *Manual of Infection Prevention & Control in Dental Settings*. Retrieved from <https://www.moh.gov.sa/Ministry/MediaCenter/Publications/Documents/2018-11-22-005.pdf> [Accessed on 30 May 2020].
14. Ministry of Health. (2020). Wegaya COVID 19 Coronavirus Disease Guidelines. Retrieved from <https://covid19.cdc.gov.sa/wp-content/uploads/2020/05/COVID-19-Coronavirus-Disease-Guidelines-en.pdf> [Accessed on 29 September 2020].
15. Hospital Respiratory Protection Program Toolkit Resources for Respirator Program Administrators. 2015. Occupational Safety and Health Administration. Retrieved from <https://www.osha.gov/Publications/OSHA3767.pdf>.
16. Jacks ME. A laboratory comparison of evacuation devices on aerosol reduction. *J Dent Hyg*. 2002 Summer;76(3):202-6.
17. Centers for Disease Control and Prevention (CDC). Interim infection prevention and control guidance for dental settings during the COVID19 response. Atlanta, GA: Centers for Disease Control and Prevention; 2020 [modified 2020 Jun 17; cited 2020 Jun 28].
18. <ADA_COVID_Int_Guidance_Treat_Pts.pdf>.
19. Narayana TV, Mohanty L, Sreenath G, Vidhyadhari P. Role of preprocedural rinse and high-volume evacuator in reducing bacterial contamination in bioaerosols. *J Oral Maxillofac Pathol*. 2016;20(1):59-65.

7. Appendices

Appendix 1. Five Moments of Hand Hygiene, English.

Your 5 Moments for Hand Hygiene

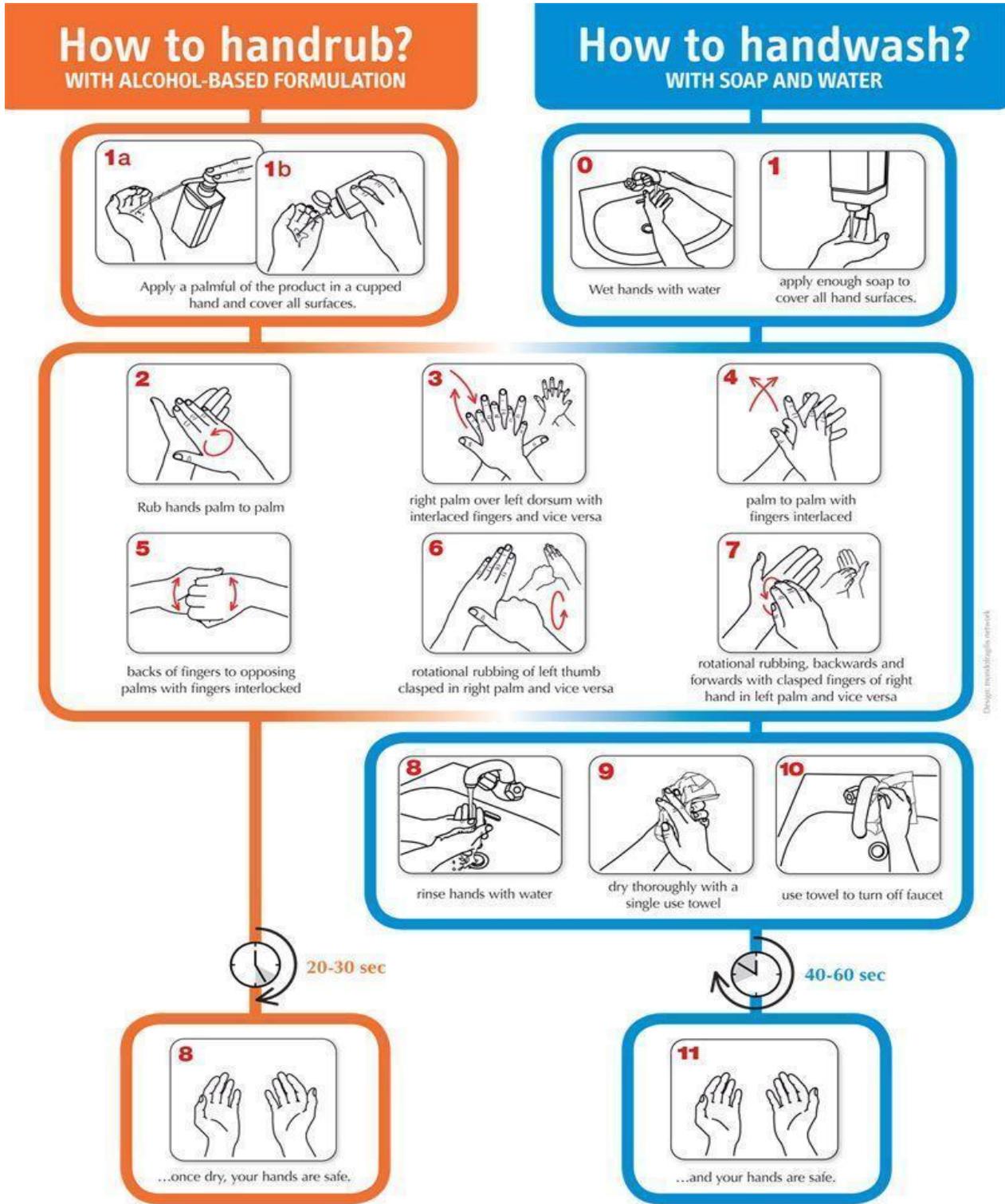
Dental Care



1	BEFORE TOUCHING A PATIENT	WHEN?	Clean your hands before touching a patient.
		WHY?	To protect the patient against harmful germs carried on your hands.
2	BEFORE CLEAN/ASEPTIC PROCEDURE	WHEN?	Clean your hands immediately before performing a clean/aseptic procedure.
		WHY?	To protect the patient against harmful germs, including the patient's own, from entering his/her body.
3	AFTER BODY FLUID EXPOSURE RISK	WHEN?	Clean your hands immediately after a procedure involving exposure risk to body fluids (and after glove removal).
		WHY?	To protect yourself and the environment from harmful patient germs.
4	AFTER TOUCHING A PATIENT	WHEN?	Clean your hands after touching the patient at the end of the encounter or when the encounter is interrupted.
		WHY?	To protect yourself and the environment from harmful patient germs.
5	AFTER TOUCHING PATIENT SURROUNDINGS	WHEN?	Clean your hands after touching any object or furniture in the patient surroundings when a specific zone is temporarily and exclusively dedicated to a patient - even if the patient has not been touched.
		WHY?	To protect yourself and the environment from harmful patient germs.



Appendix 2. Combined Hand Hygiene Technique, English.



WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.



October 2006, version 1.