GUIDELINES FOR INFECTION CONTROL IN DENTISTRY

Version 1

Health Policies and Standards Department

Health Regulation Sector (2021)

INTRODUCTION

Dubai Health Authority (DHA) is the responsible entity for regulating, licensing and monitoring health facilities and healthcare professionals in the Emirate of Dubai. The Health Regulation Sector (HRS) is an integral part of DHA and was founded to fulfil the following overarching strategic objectives and program:

Objective #1: Position Dubai as a global medical destination by introducing a value-based, comprehensive, integrated and high quality service delivery system.

Objective #2: Direct resources to ensure healthy and safe environment for Dubai population.

Strategic Program #5: Oral & Dental Care: This program focuses on improving the oral health outcomes and ensure that all individuals have access to high quality treatments and effective prevention programs for dental care.

ACKNOWLEDGMENT

This document was developed by Dental Services Department, Primary Healthcare Services Sector (PHCSS). It has further been reviewed by the Health Policy and Standards Department (HPSD), HRS.

HRS would like to acknowledge and thank all parties that participated and worked toward developing these guidelines to ensure improving the quality and safety of healthcare services.

The Health Regulation Sector

Dubai Health Authority

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EXECUTIVE SUMMARY

Clinical guidelines are increasingly becoming part of current practice and will become more common over the next decade. These Clinical Guidelines aim to improve the quality and the level of healthcare provided to the clients. Healthcare providers can use these guidelines to answer specific questions in day-to-day practice and as an information source for continuing professional education.

This document presents a framework for dental healthcare providers to ensure that all dental clinics prioritize infection prevention and are equipped to observe standard precautions and other infection prevention recommendations.

DEFINITIONS

Blood borne pathogens: are infectious microorganisms in human blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV).

Disinfection: is a process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects in health-care settings, objects usually are disinfected by liquid chemicals or wet pasteurization.

Hand hygiene: is a way of cleaning one's hands that substantially reduces potential pathogens (harmful microorganisms) on the hands. Hand hygiene is considered a primary measure for reducing the risk of transmitting infection among patients and health care personnel. Hand hygiene procedures include the use of alcohol-based hand rubs (containing 60%–95% alcohol) and hand washing with soap and water.

Sterilization: is a process that destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods.

ABBREVIATIONS

AAMI	:	Association for the Advancement of Medical Instrumentation
ABHR	:	Alcohol-Based Hand Rub
ATP	:	Adenosine Triphosphate
B&D	:	Bowie & Dick
BI	:	Biological Indicators
CDC	:	Centers for Disease Control
CFU	:	Colony-Forming Unit
CI	:	Chemical Indicators
CSSD	:	Central Sterile Services Department
DHA	:	Dubai Health Authority
DHCP	:	Dental Healthcare Personnel
DM	:	Dubai Municipality
DUW	:	Dental Unit Waterlines
FIFO	:	First In, First Out
HBV	:	Hepatitis B Vaccine
HPSD	:	Health Policy and Standards Department
HRS	:	Health Regulation Sector
IFU	:	Instruction for Use
NiTi	:	Nickel Titanium
PCD	:	Process Challenge Device
PEP	:	Post-Exposure Prophylaxis

PHCSS	:	Primary Healthcare Services Sector
PPE	:	Personal Protective Equipment
PPMR	:	Pre Procedural Mouth Rinse
VPDs	:	Vaccine Preventable Diseases
WHO	:	World Health Organization

A. GUIDELINES FOR CLEANING, DISINFECTION AND STERILIZATION OF PATIENT CARE ITEMS IN DENTAL CLINICS

1. BACKGROUND

This guideline combines existing international and regional recommendations and add new ones for infection control in Dental healthcare settings in the Emirate of Dubai. This includes the following:

- Education and Protection of Dental Healthcare Personnel
- Prevent Transmission of Blood-borne Pathogens
- Hand Hygiene
- Use of Personal Protective Equipment
- Sterilization and disinfection of patient – care items
- Environmental Infection Control
- Dental Unit Waterlines (DUW), Water Quality and Biofilms
- Engineering Controls and Safe Work Practice
- Waste Management
- Special Considerations.

2. SCOPE

2.1. To ensure that all dental clinics prioritize and manage cleaning, disinfection and sterilization of patient care items in in DHA licensed Dental Clinics.

3. PURPOSE

3.1. To ensure infection prevention and ensure all DHA licensed dental clinics are equipped to observe standard precautions and other infection prevention recommendations.

4. APPLICABILITY

4.1. DHA Licensed Dental Healthcare Professionals.

5. RECOMMENDATION ONE: EDUCATION AND PROTECTION OF DENTAL HEALTHCARE PERSONNEL

5.1. Education

5.1.1. Dental Healthcare Personnel (DHCP) are more likely to comply with an infection control program and exposure-control plan if they understand its rationale. Clearly written policies, procedures, and guidelines can help ensure consistency, efficiency, and effective coordination of activities. Personnel subject to occupational exposure should receive infection-control training on initial assignment, when new tasks or procedures affect their occupational exposure and at a minimum, annually.

5.1.2. Dental staff must be provided with comprehensive training to carry out their day-to-day work. Regular refresher training is also appropriate to ensure the necessary infection control measures are being complied with and understood.

5.1.3. New clinical dental staff should complete an orientation program. This pre-service training should include the practical implementation of infection control measures used in the practice.

5.1.4. This orientation program should comprise the following:

a. Practice expectations in terms of infection control and safe working procedures.

b. Recommendations for vaccination.

c. Reporting requirements for sharps injuries and workplace incidents.

d. Management of waste streams and hazardous substances.

e. Identification of clean and contaminated zones.

f. Use of personal protective equipment.

5.1.5. Educational materials should be appropriate in content and vocabulary for each person's educational level, literacy and language, as well as be consistent with existing federal and local regulations.

5.2. Continuous Professional Development

5.2.1. To supplement and update the information provided from the initial orientation, competency-based assessment and continuous professional education related to the scope of work and infection control topics should be developed and implemented to ensure DHCP are abreast with the current updates and accreditation standards.

a. Accredited CMEs from reputable organization/sources.

b. Competency assessment.

5.3. Health Immunization

5.3.1. DHCP and clinical support staff are at risk of exposure to many common Vaccine-Preventable Diseases (VPDs) through contact with patients and the community. Immunizations substantially reduce the potential for acquisition of disease, thereby limiting further transmission to other dental staff and patients. The Centers for Disease Control (CDC)

strongly recommends implementation of a written comprehensive policy regarding immunization of all DHCP, screening immune status of each staff, including the list of all required and recommended immunizations. The below listed are the mandatory and recommended vaccines for all employees.

5.3.2. Mandatory Vaccination

a. Hepatitis B Vaccine (HBV)

I. If previously unvaccinated, give 3 doses series of Hepatitis B occupational clinic/family vaccine to all non- immune employees upon hiring.

II. Hepatitis B Antibody will be checked after the vaccination is completed. If the level is < 10 international units, a second 3 doses series will be given.

III. If the repeat Hepatitis B Antibody is still <10 international units, then the employee will be labelled as non-responder. For non-responders: HCP who are non-responders should be considered susceptible to HBV and should be counselled regarding precautions to prevent HBV infection.

b. Varicella Vaccine

I. If the employee have not had chickenpox (varicella), if you haven't had varicella vaccine, or if you don't have an up-to-date blood test that shows you are immune to varicella (i.e., no

serologic evidence of immunity or prior vaccination) get 2 doses of varicella vaccine, 4 weeks apart.

5.3.3. Recommended vaccines

a. Offer/provide Influenza vaccine annually to all clinical healthcare providers, before the influenza season.

b. Recommend Pneumonia vaccination at age 65 (one time vaccine).

c. Recommend Tetanus booster (once every 10 years).

5.3.4. Vaccination records

a. The practice must develop and maintain regularly updated immunization/health records for all healthcare workers. Staff should be asked to declare their vaccination status for hepatitis B, influenza and other infections of relevance to the healthcare setting.

6. **RECOMMENDATION TWO:** PREVENTING TRANSMISSION OF BLOOD BORNE PATHOGENS

6.1. Times have changed since Universal Precautions were first set in place. In 1996, the Centers for Disease Control and Prevention established the term “Standard Precautions.” This broadened the focus on prevention, applying the principles to all patients regardless of diagnosis or presumed infection status. These guidelines consider the risk of transmission of illness from both recognized and unrecognized sources. The 21st century has seen devastating illness from Ebola virus, avian flu, West Nile virus, SARS, MERS, Zika virus and biological warfare as well as the pandemic flu (SARS COV 2). Gloves alone do not completely

protect a health professional or patient. Even diseases usually transmitted by contact can be aerosolized by saliva and respiratory secretions. Irrigating a wound can risk a splash back of fluid. Respirator masks can be contaminated. Today, public health officials must prepare against contact and airborne transmission as well as blood borne risks. Standard Precautions are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where health care is delivered. These practices are designed to both protect and prevent DHCP from spreading infections among patients.

6.2. Standard precaution includes:

6.2.1. Hand hygiene

6.2.2. Personal Protective Equipment (PPE)

6.2.3. Sterilization of instruments and devices

6.2.4. Cleaning and disinfection of environmental surfaces

6.2.5. Engineering and work practice controls

6.2.6. Respiratory hygiene/cough etiquette

6.2.7. Safe injection practices (i.e., aseptic technique for parenteral medications).

6.3. **Hand Hygiene**

6.3.1. Hand hygiene (e.g., handwashing, hand antisepsis, or surgical hand antisepsis) substantially reduces potential pathogens on the hands and

is considered the single most critical measure for reducing the risk of transmitting organisms to patients and DHCP.

6.3.2. Perform hand hygiene with soap and water when hands are visibly dirty or contaminated with blood or other potentially infectious material. If hands are not visibly soiled, an alcohol-based hand rub (ABHR) can also be used following the manufacturer's instructions.

6.3.3. For oral surgical procedures, perform surgical hand antisepsis before donning sterile surgeon's gloves. Follow the manufacturer's instructions by using either an antimicrobial soap and water, or soap and water followed by drying hands and application of an alcohol-based surgical hand-scrub product with persistent activity.

6.3.4. For indications for hand hygiene refer to **Appendix 1.**

6.3.5. For Hand Hygiene Steps refer to **Appendix 2.**

6.3.6. Hand Hygiene Audit

a. In order to monitor hand hygiene compliance, it is recommended to perform hand hygiene audits regularly. This tool is helpful in surveillance and monitoring staff or unit compliance with existing policies. Planning educational activities, future training and rewarding will depend on the outcome of the audit.

6.4. Personal Protective Equipment (PPE)

6.4.1. Masks

a. DHCP and clinical support staff must wear suitable fluid-resistant surgical masks or N-95 mask/Respirator mask (in case of aerosol generating procedures). Masks protect the mucous membranes of the nose and mouth and must be worn wherever there is a potential for splashing, splattering or spraying of blood, saliva or body substances, or where there is a probability of the inhalation of aerosols with a potential for transmission of airborne pathogens. In the dental surgery environment, the most common causes of airborne aerosols are the high-speed air rotor hand-piece, the ultrasonic scaler and air and water syringe. The filtration abilities of a mask begin to decline with moisture on the inner and outer surfaces of the mask.

b. Masks must:

   I. Be fitted and worn according to the manufacturer's instructions – this means using both tie strings if the mask has two ties and adapting the mask to the bridge of the nose.

   II. Cover both the nose and mouth, and where possible be folded out fully to cover the chin and upper neck; and be removed by touching the strings and loops only.

   III. Perform seal check for N-95 masks/Respirator mask.

c. Masks must not:

   I. Be touched by the hands while being worn.

II. Be worn loosely around the neck while the DHCP walks around the premises, but be removed and discarded after use.

6.4.2. Protective Eyewear and Goggles

a. DHCP must wear protective eyewear to protect the mucous membranes of the eyes during procedures where there is the potential for penetrating injury or exposure to aerosols, splattering or spray.

b. An alternative to protective eyewear is a face shield. However, this does not protect from inhaled microorganisms and must be worn in conjunction with a surgical mask.

c. Clean with soap and water, or if visibly soiled, clean and disinfect reusable facial protective equipment between patients.

d. Patients must be provided with protective eyewear (either single use or reusable) to minimize the risk of possible injury from materials or chemicals used during treatment.

e. Prescription lenses/glasses are not a substitute for protective eyewear.

6.4.3. Protective Clothing

a. Protective clothing (e.g. disposable gown), should be worn while treating patients when aerosols or splatter are likely to be generated or when contaminated with blood or saliva.

b. The protective gown worn in the clinical area must be removed before eating, drinking, taking a break or leaving the practice premises.

c. Change protective clothing if visibly soiled; change immediately or as soon as feasible if penetrated by blood or other potentially infectious fluids.

6.4.4. Gloves

a. Gloves must be worn whenever there is risk of exposure to blood, saliva or other body secretions or when hands will come in contact with contaminated items.

b. A new pair of gloves must be used for each patient and changed as soon as they are cut, torn or punctured.

c. Both opened and unopened boxes of gloves must be stored away from aerosol contamination where they will not be exposed to droplets generated by patient care.

d. If the DHCP or patient has a proven or suspected allergy to latex, alternatives must be used such as neoprene or nitrile gloves.

e. Heavy duty gloves are recommended in dental decontamination area.

f. Heat resistant gloves are to be used while handling items from autoclave.

g. Hand care

I. Hands must be well cared for, because intact skin is a first line defence mechanism against infection.

II. Damaged skin is an important issue because of the high frequency of dry, itchy skin from irritant contact dermatitis, primarily caused by frequent and repeated use of handwashing products– especially soaps, other detergents, and paper towel use, resulting in drying skin.

III. Use hand lotions to prevent skin dryness associated with handwashing.

IV. Consider the compatibility of lotion and antiseptic products and the effect of petroleum or other oil emollients on the integrity of gloves during product selection and glove use.

V. All hand, wrist or nail jewellery, (e.g. rings, wrist watches and bracelets) must be removed prior to hand hygiene and putting on gloves as their presence compromises the fit and integrity of gloves and promotes significant growth of skin microorganisms. A plain band ring such as a wedding ring may be left on.

VI. Fingernails must be kept short to prevent glove tears and to allow thorough hand cleaning. Artificial fingernails must not be worn.

h. Footwear

I. Dental healthcare workers should wear enclosed footwear that will protect them from injury or contact with sharp objects (e.g. accidentally dropped sharps or spilt chemicals).

6.5. Sterilization of instruments and devices

6.5.1. Physical Facilities

a. Designate a central processing area. Divide the instrument processing area, physically or, at a minimum, spatially, into 3 distinct areas for:

I. Decontamination (soiled items)

II. Preparation, packaging and sterilization (clean items)

III. Sterile storage (sterile items).

b. It is recommended that when physical barriers are not available (e.g.: walls to separate clean area from the dirty area) procedural barriers should be used whereby soiled activities should be performed first, the work area should be cleaned and disinfected, and personnel should remove all PPE and thoroughly wash their hands. Then preparation packaging and sterilization activities shall be performed.

c. When only one workspace is available, ensure one-way workflow, from contaminated to clean area. For example, using colour– coded markers to distinguish dirty from clean areas is one way of ensuring unidirectional workflow.

d. The instrument reprocessing area must be appropriate in layout and size for the volume of instruments being reprocessed.

e. Good lighting to minimize the risk of sharps injury and enable inspection of cleaned instruments.

6.5.2. Instrument Classification

a. Patient care equipment's are categorized as critical, semi- critical or noncritical depending on the potential risk for infections associated with their intended use (Spaulding's classification):

CRITICAL *penetrate tissue or bone*

- Examples: extraction forceps, scalpel blade, surgical burs, periodontal scalers,

SEMI CRITICAL *touch only mucuos membrane and non - intact skin*

- Examples: dental handpieces, impression trays, mouth mirrors, filling instruments

NON CRITICAL *contact with intact skin*

- Examples: light arm/handles, lightcure unit, dental chair, BP cuff, chair switches, pulse oximeter

b. According to the CDC, all patient-care items must be cleaned prior to sterilization. Following cleaning, heat-stable critical and semi-critical dental instruments must be heat sterilized.

c. Since most semi critical items in dentistry are heat tolerant, they also should be sterilized using heat.

d. Heat-sensitive semi-critical items must at least undergo high-level disinfection or follow the manufacturer's Instruction for Use (IFU) for reprocessing such item.

e. Non critical items requires cleaning and disinfection between patients using low to intermediate level disinfectant.

NOTE: The basic principle for effective infection prevention and control is "do not disinfect when you can sterilize."

6.5.3. Transfer of contaminated instruments

a. It is recommended that gross soil be removed from instruments by wiping them at the chairside onto a dampened gauze using a one-handed method to prevent the risk of sharps injury during the wiping action.

b. Alternatively, if they are unable to be cleaned immediately, the instruments may be soaked in detergent or an enzymatic agent to prevent hardening of residue.

c. Contaminated instruments shall be transported in a covered, fully enclosed puncture resistant, leak-proof, closable containers

manually or by cart to minimize handling and prevent the potential for a penetrating injury if the container is dropped.

d. All carts and containers containing contaminated devices should be labelled (with bio-hazard label).

e. Cart or containers must be decontaminated regularly.

6.5.4. Decontamination Area

a. Re-usable dental devices shall be thoroughly cleaned before disinfection or sterilization. The process of cleaning physically removes contaminants from the devices rather than killing microorganisms.

b. If an item is not cleaned, soil (blood, cement, body fluids, debris etc.) can protect the micro-organisms from the action of disinfection or sterilization, making the process ineffective as well as inactivate the disinfectant or sterilant so that it does not work.

c. PPE in Decontamination Area

I. Trained staff must use heavy-duty utility (puncture and chemical-resistant) gloves, and wear eye protection/face shield, a mask, hair and shoe covering and a waterproof/fluid-resistant gown/apron.

6.5.5. Preparation for Cleaning Process

a. Once contaminated devices have been received in the re-processing area they should be disassembled and sorted. They may also require pre-treatment prior to cleaning.

b. Disassembling– facilitate access of the cleaning agent, disinfectant and sterilant to device surface. Follow the manufacturer's recommendations when disassembling devices prior to cleaning.

c. Sorting– items should be sorted according to the type of items being processed.

d. Pre-treatment– to soften and facilitate the removal of the soil using detergent or enzymatic agent.

e. Special consideration:

   I. DHCP should use the cleaning method (manual, mechanical or combination of both) specified in the device/instruments' written IFU.

   II. Every surface of the item must come in contact with the cleaning solution.

   III. Hinged items must be completely open during cleaning process.

   IV. Multipart items must be disassembled according to the manufacturer.

   V. To prevent damage, delicate devices should always be placed on top of heavier items.

Note: Always remember - Disinfection or Sterilization will not compensate for poor cleaning. “Cleaning, not sterilization (or disinfection), is the first and most important step in any instrument processing protocol. Without first subjecting the instrument to a thorough, validated and standardized (and ideally automated) cleaning process, the likelihood that any disinfection or sterilization process will be effective is significantly reduced."

6.5.6. Cleaning Process

a. Manual cleaning

I. Manual cleaning might be the only effective method for certain instrumentation such as powered equipment that cannot be immersed, the items that are delicate and also be performed as a preliminary step before mechanical washing.

II. Soft bristle brushes are recommended to use during manual cleaning.

III. To prevent the formation of bio-film, all cleaning implements should be regularly cleaned and disinfected.

b. Mechanical Cleaning

I. Mechanical cleaning of instruments can be carried out in instrument washers or ultrasonic cleaners.

II. Whenever possible, clean devices by mechanical means. Devices made of glass or plastic should not be processed in the ultrasonic cleaner. Powered equipment and items that cannot be immersed like hand pieces (high speed, low speed, straight hand piece, scaler hand pieces and rotary) should not be processed using mechanical means. Use mechanical washers in accordance with the manufacturer's instruction.

c. Ultrasonic Cleaner

I. It is a type of automated cleaning equipment, transmit sound waves through a cleaning solution and create a mechanical action called cavitation. It is very effective in cleaning of hard to reach areas such as box-locks, serrations, ratchets and teeth on instruments.

II. The manufacturer's instruction shall be followed for use and routine use, cleaning and maintenance of the ultrasonic cleaner.

III. Items must be completely immersed in the cleaning solution. (Use metal tray with mesh or perforated bottom to place the instrument).

IV. Degassing must be performed before placing the instruments in the ultrasonic machine.

V. The ultrasonic solutions should be changed frequently (at the end of each shift or the solution is visibly soiled.) to reduce the level of microorganisms.

VI. Operate with the lid closed to avoid aerosol contamination.

VII. Do not put hand pieces, re-usable items made of glass and plastic in the ultrasonic cleaner.

VIII. Empty, clean and dry the bath at the end of the day.

d. Thermal Washer Disinfector

I. Washer disinfectors are strongly recommended for devices that can withstand mechanical cleaning and a temperature of 93°C, to achieve the required exposure for cleaning and to reduce potential risk to personnel when used. Mechanical washer cycle usually includes a pre-wash or soak cycle, a rinse cycle, a wash cycle, multiple rinses and a sanitization or disinfection cycle.

II. The manufacturer instruction shall be followed for the use, preventive and routine maintenance, cleaning and calibration of the washer disinfector.

III. Ensure that, processing personnel verify the detergent level daily to ensure an adequate supply of detergent.

IV. Daily clean the drain basket and verify that the spray arms are moving and not blocked.

Note: Improper loading of mechanical washer is a major contributor to cleaning failures.

e. Verification of Cleaning Process

I. Cleaning verification by users should include visual inspection combined with other verification methods like Adenosine Triphosphate (ATP) that allow assessment of instrument surfaces and channel.

II. Soil test– validation test to monitor the cleaning efficiency of washer – disinfectors. "Mechanical cleaning equipment performance should be tested each day as it is used and all results should be recorded."

III. Cavitation test– validation test for ultrasonic cleaner. Association for the Advancement of Medical Instrumentation (AAMI) recommends testing daily whenever the equipment is in use.

f. Rinsing

I. Rinsing is the most important step in the cleaning process and is necessary to remove loosened soil and residual detergent.

II. Rinse all devices thoroughly after cleaning with water to remove residues, which might react with detergent or disinfectant.

g. Drying

I. Follow manufacturer's instruction for drying of the devices.

II. Devices shall be air dried or dried by hand with clean lint-free towel/paper towel.

III. Dry stainless steel devices immediately after rinsing to prevent spotting.

6.5.7. Preparation, packaging and sterilization

a. Traffic must be kept to a minimum; any one entering the preparation area must wear proper attire.

b. Preparation of instruments for packaging includes inspection for cleanliness, functionality and completeness. A table-top magnifying glass and adequate lighting are essential during inspection.

c. Instruments can be packaged singly (usually in paper-plastic pouches) or into small procedure trays or larger instrument sets (wrapped or containerized).

d. Hinged instruments should be processed open and unlocked and check for functionality. Sharp instruments should be packed with instrument tip protectors (if used-should be steam-permeable).

e. Manufacturer's instruction for preparation, packaging and sterilization of instruments should always be followed.

f. Internal chemical indicators (CI) should be placed inside every package at the center of the sets where sterilant penetration is most difficult to achieve.

g. Packaging materials should be compatible with the type of sterilizer.

6.5.8. Labelling Package

a. All packages must be labelled completely and correctly.

b. Labels should identify the operator, the sterilizer, the cycle number/load number, the date of processing and the expiration date (when applicable).

c. Label using a marking pen containing nontoxic permanent ink or use of customized sterilization labels (e.g. gun labels).

d. Packages should be labelled on the indicated tape used to close the package.

e. Peel pouches should be labelled only on the plastic side or on an autoclave tape.

f. Labelling should not damage the packaging material; never use a ball-point pen on any packaging material as it can create holes in the material.

6.5.9. Sterilization

a. Table top steam sterilizer

I. It is a compact steam sterilizer that has a chamber volume of not more than 2 cubic feet and generates its own steam when distilled or deionized water is added by the user.

II. Table top steam sterilizers are commonly used in the dental practice. It should never be installed in an area where explosives or flammable materials or anesthetics are used or stored. Table

top sterilizers that do not have recording devices (displays/gauges) are not recommended to be used because it is necessary for the operator to monitor the sterilization parameters.

III. Steam sterilizers should be loaded in the following manner:

- Package should be able to lie flat in a single layer, away from the chamber walls and avoid overloading. Holding racks specifically designed for paper-plastic pouches may be used for adequate sterilant contact and drying.
- In a steam sterilizer, place them paper side down. Placing plastic side down could result in condensation of water inside the pouch resulting in wet packs and must be considered contaminated.
- Heavy instrument sets (which generates large quantities of liquid condensate) should be placed on the lower shelves.
- Select the proper cycle for the type of instruments to be processed.
- Upon completion of the cycle, the operator is responsible for unloading the sterilizing shelf. Load not to be handled until cooled. Sterile packages should be inspected for damage, package identification, moisture and visual change of the chemical indicator.

IV. Maintenance of Steam Sterilizers:

- Follow the manufacturer's guidelines for the cleaning of all autoclaves (daily, weekly, monthly checks).

V. Sterility Assurance

- Instruments are assumed to have been sterilized when the correct sterilization parameters have been achieved.
- Physical, chemical and biological monitoring shall be routinely performed to verify the effectiveness of sterilizers and the sterilization processes.

VI. Physical Monitors

- It is the observation of the charts (display/monitor or built-in), gauges and print– outs at the end of each sterilization cycle. The sterilizer operator should review the data and verify that the time, temperature and pressure were correct for the load contents.

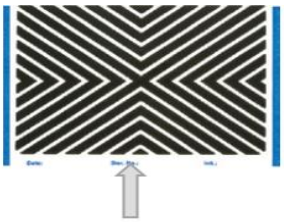
VII. Chemical Indicators

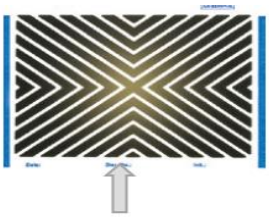
- This involves the use of external chemical indicators to verify the load has been subjected to a sterilization process; the use of internal chemical indicators to verify that individual packaged items have been exposed to one or more of the conditions necessary for sterilization:

6.5.9.a.VII..1. Type 1- Process Indicators (External CI) differentiates processed and unprocessed packages

Example: sterilization tape, label.

6.5.9.a.VII..2. Type 2- Indicators for specific test such as Bowie & Dick (B&D) test. This test must be performed





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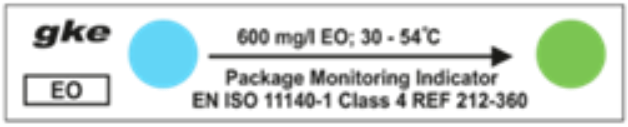
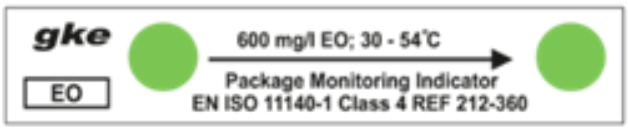
daily to detect air leaks or inadequate air removal from pre-vacuum sterilizers. The B&D test packs should be placed on the bottom shelf of the rack, directly over the drain line, to present the greatest challenge to the sterilizer.

6.5.9.a.VII..3. Type 3- Single-Variable Indicators- indicators respond to only one critical variable (e.g. temperature). They have limited value in general dentistry.

6.5.9.a.VII..4. Type 4- Multi-Variable Indicators- are designed to react to two or more of the critical sterilising variables (e.g. time and pressure).



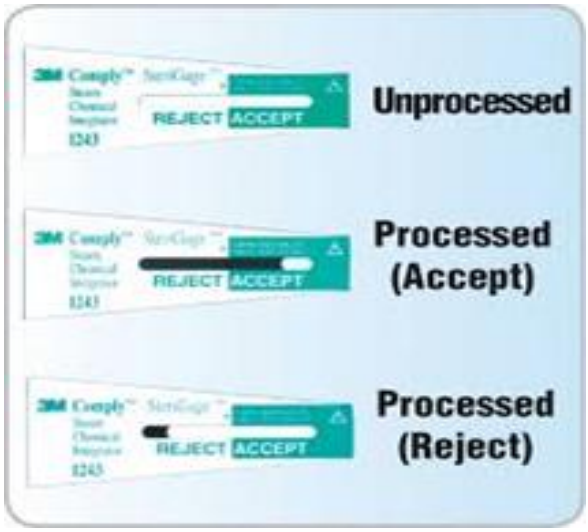
Before Sterilization



After Successful Sterilization

Code	Product Code	Quantity
GKE019	C-E-P-4-SV3	3200

6.5.9.a.VII..5. Type 5- Integrating indicators - Designed to react to critical variables of the specific sterilization process that they are designed to monitor. It is performed in a manner that parallels the performance of BI, however, it is important to understand that this



type of indicator does not contain live bacterial spores and should not be used as a substitute for a biological indicator.

6.5.9.a.VII..6. Type 6: Emulating (Cycle Verification) – designed to react to all critical variables of a specified sterilization cycle. They should only be used in the specific cycle for which they are labelled.

VIII. Biological Indicators (BI)

- A biological indicator is a sterilization test that contains viable, non-pathogenic microorganisms (Geobascillus stearothermophilus) that provides a defined resistance to a specified sterilization process. Biological monitoring is the

only way to measure the lethality of the sterilization process.

- BI is placed in the most challenging location in the chamber. In a steam sterilizer, this is typically on the bottom shelf near the drain. The testing should be done in a fully loaded

chamber. Whenever BI is used, a control BI (one that is not sterilized) is needed with the same lot number of the test BI and the control BI must be positive for the test result to be valid.

- Processed biological indicators are to be placed in the rapid read-out incubator that can show results in 24 minutes depending on the type of BI incubator used.
- Routine BI testing for steam sterilization is recommended to be done weekly, preferably daily and for qualification testing. Qualification testing is performed when a new sterilizer is installed, when a sterilizer is relocated or after a major repair.
- If the sterilizer is designed to be used for multiple types of modes or cycles, then it should also be routinely tested with a BI, Process Challenge Device (PCD) on a fully loaded chamber.
- PCD are devices designed to constitute a defined resistance to a sterilization process and used to assess performance of the process.

IX. Recalls

- When positive BI occurs:

6.5.9.a.IX..1. Review the sterilizer chart and CI to verify all parameters were met.

6.5.9.a.IX..2. Take back all the items to Central Sterile Services Department (CSSD).

6.5.9.a.IX..3. Re-test the autoclave by using biological, physical and chemical indicators after correcting any identified procedural problems.

6.5.9.a.IX..4. If the cause of the failure is immediately identified (operator error) and retest results are Negative, correct the cause and reprocess the load.

6.5.9.a.IX..5. If the cause of the failure cannot be identified and the result of the retest is still positive, label and quarantine the load and recall all items processed back to the last negative BI, and reprocess those items.

6.5.10. Storage of Reprocessed Dental Devices

a. Devices that have been properly reprocessed, stored and handled will remain sterile indefinitely, unless the integrity of the package is compromised. (i.e. open, wet dry) or as per the policy of the organization.

b. The “first in, first out” (FIFO) rule – using the oldest supplies first – promotes proper rotation of supplies and prevent “outdates”.

c. Events that can compromise the sterility of a sterile item includes:

I. Holes or torn wrappers

II. Broken or incomplete seals on pouches.

III. Items that have been dropped on a dirty surface.

IV. Exposure to any type of moisture.

V. Elastic bands or tapes should not be used to bundle items.

Note: Care should be taken when moving packages of instruments within drawers to reduce the chance of a surface breach through instruments perforating the paper or textile of the package.

6.6. **Cleaning and disinfection of environmental surfaces**

The dental operatory and instrument reprocessing areas must have clearly defined clean and contaminated zones. The contaminated zone is the area contaminated with material from patient care, as well as the instrument cleaning area. The clean zones of the dental practice include office areas, staff room, waiting and reception areas as well as those areas used for storage of supplies and sterilized instruments and equipment.

6.6.1. Clinical Contact Surfaces

a. Reducing the extent of contamination of the dental operatory can be achieved in part by use of rubber dam, pre-procedural antiseptic mouth-rinses, high volume evacuation and correct patient positioning.

I. Use surface barriers to protect clinical contact surfaces, particularly those that are difficult to clean (e.g., switches on dental chairs) and change surface barriers between patients.

II. Clean and disinfect clinical contact surfaces that are not barrier-protected, by using an intermediate level disinfectant (i.e., tuberculocidal claim) activity after each patient.

III. Use PPE, as appropriate, when cleaning and disinfecting clinical contact surfaces.

IV. Note: Instruments placed into the contaminated zone for a treatment session but not used during the session must be regarded as contaminated. For this reason, supplies such as opened boxes of gloves, cotton rolls or gauze must be protected and kept inside the drawers away from contamination from splashes and aerosols.

6.6.2. Housekeeping surfaces

a. Clean housekeeping surfaces (e.g., floors, walls, and sinks) on a routine basis, depending on the nature of the surface and type and degree of contamination, and as appropriate, based on the location in the facility, and when visibly soiled.

I. Cleaning methods must avoid the generation of aerosols. Damp dusting, dust-retaining mops and vacuum cleaners with air filtration of the exhaust are recommended.

II. Clean mops and cloths after use and allow to dry before reuse; or use single-use, disposable mop heads or cloths.

III. Use PPE, as appropriate, when cleaning and disinfecting housekeeping surfaces.

6.7. **Engineering and work practice controls**

6.7.1. Use standard precautions for all patient encounters.

6.7.2. Implement a written, comprehensive program designed to minimize and manage DHCP exposures to blood and body fluids

6.7.3. Engineering and work-practice controls

a. Identify, evaluate, and select devices with engineered safety features as they become available on the market (e.g., safer anesthetic syringes, blunt suture needle and retractable scalpel).

b. Place used disposable syringes and needles, scalpel blades, and other sharp items in appropriate puncture-resistant containers located as close as feasible to the area in which the items are used.

c. Do not recap used needles by using either hands or any other technique that involves directing the point of a needle toward any part of the body. Do not bend, break, or remove needles before disposal.

d. Use either a one-handed scoop technique or a mechanical device designed for holding the needle cap when recapping needles.

6.7.4. Post exposure management and prophylaxis after an occupational exposure to blood/body fluids.

a. The dental practice should have a clear set of written instructions on the appropriate action to take in the event of a sharps injury/occupational exposure to either staff or patients.

b. During an exposure, stop work immediately.

c. For sharps/needle stick injury, allow the wound to bleed freely and clean it thoroughly with soap and water. There is no benefit in squeezing the wound. Do not apply disinfectants as some are irritants and retard healing.

d. For eye splash exposure - flush mucous membranes/conjunctiva with normal saline or water using the nearest sink or eyewash station- if available. If contact lenses are worn, remove after flushing eye and clean as usual.

e. Do necessary baseline testing for source and exposed employee.

f. An assessment of the risk of transmission by a physician is an urgent priority to determine whether Post-Exposure Prophylaxis (PEP) is necessary.

g. A full record of the incident should be made.

6.7.5. Dental Unit Waterlines

a. The organisms, which grow in waterline biofilms, are environmental in origin. They flourish in the waterlines of a dental

unit because lines to the hand pieces, three-way syringe and ultrasonic scaler are small in diameter, and hence have very slow flow rates.

b. Most dental unit waterlines contain biofilm, which acts as a reservoir of microbial contamination. Biofilm in dental unit waterlines may be a source of known pathogens (example Pseudomonas aeruginosa and Legionella).

c. Biofilm levels in dental equipment can be minimized by using a range of measures, including:

   I. Water treatments using chemical dosing of water (e.g. with H2O2, per oxygen compounds).

   II. Flushing lines (e.g. air/water syringe and hand pieces) after each patient use for 20 to 30 seconds.

   III. Flushing waterlines at the start of the day for 2-3 min, to reduce overnight or weekend biofilm accumulation. This is particularly important after periods of non-use (such as vacations and long weekends).

   IV. Flushing each day has been shown to reduce levels of bacteria in dental unit waterlines.

d. Sterile irrigants such as sterile water or sterile saline as a coolant are required for surgical procedures such as dent alveolar surgery, endodontic surgery, and dental implant placement.

e. Patients should not be encouraged to close their lips around the suction tip to avoid creating negative pressure that may cause a back flow of fluids.

6.7.6. Water Testing

a. Water quality must be tested to assess efficacy of the water treatment system. All DHCP should be trained on acceptable water quality, biofilm formation, water treatment methods, and proper maintenance schedule for delivery system.

6.7.7. For Dubai Municipality (DM) Guidelines on Dental Unit waterlines testing refer to **Appendix 3.**

6.7.8. Waste Management

a. Medical waste can be defined as any solid waste generated in a health care facility. Waste segregation should be in line with the local regulations. As per Guidelines for Handling Biological waste, Ministry Circular no. 172, 2018 the waste generated in health care facility are classified as per **Appendix 4.**

7. **RECOMMENDATIO THREE:** SPECIAL CONSIDERATION

7.1. Biopsy specimen

7.1.1. Must be kept in a leak-proof, sealed container marked with the biohazard symbol to protect anyone handling or transporting them.

7.1.2. Gloves should be worn when handling them. Using plastic zip bags labelled with the appropriate biohazard symbol and provided by the

pathology lab is preferred. If a specimen container is visibly contaminated, the outside of the container should be cleaned and disinfected before placing it in the transporter bag.

7.2. Hand piece management

7.2.1. All dental hand pieces should be cleaned and lubricated, and sterilized after each patient, as do ultrasonic scaler hand pieces. However, they should not be fully submerged in water at any point during the cleaning process. The exterior surfaces of dental hand pieces must be cleaned, and their internal parts must be cleaned and lubricated before sterilizing it.

7.2.2. It is recommended to use automatic lubricate and flush-through systems to clean and lubricate dental hand pieces due to their low oil dosing rates.

7.2.3. Hand pieces should not be fitted to the dental unit until it is required to be used on a patient.

7.2.4. Pre-sterilization cleaning of high and low speed dental hand pieces and then processing in a downward displacement steam sterilizer is adequate for general dental treatments, but using a pre-vacuum cycle is preferred. Surgical hand pieces must be sterilized using a pre-vacuum (B type) cycle in a pre-vacuum sterilizer.

7.2.5. If a dedicated hand piece cleaning system is not used, this next protocol should be followed for the pre-sterilization cleaning:

a. If instructed by the manufacturer, put a blank bur in the chuck during cleaning to avoid water contamination and damage to the hand piece bearings.

b. Clean the outside of the hand piece with detergent and water– never clean use disinfectant solutions or the ultrasonic cleaner.

c. Lubricate the hand piece with pressurised oil for the recommended period of time.

d. Clean off excess oil.

e. Sterilise in a steam steriliser.

f. Run the hand piece momentarily before use to remove excess lubricant. This step is unnecessary if an air purge was run at the end of the lubricating process before sterilisation.

g. Before using the hand piece in a clinical setting:

I. Flush for 2 minutes in the morning and for 20–30 seconds after each patient for normal dental surgery procedures, and longer flushing is advised after weekends.

II. Flush at the start of the day without hand pieces connected to the waterlines.

7.3. Reduce microorganisms transferred to patients

7.3.1. Remind patients not to close their lips around the saliva ejector, especially if the high-volume evacuator is being used simultaneously.

7.3.2. Instruments are no longer sterile if dropped on the floor, or if their outer wrap is wet or torn. They must be cleaned and sterilized.

7.4. Handling of sharp instruments and needles

7.4.1. Used sharp instruments are considered potentially infective and must be handled carefully to prevent injuries.

7.4.2. To remove a sharp object, use a haemostat or instrument, not your hands.

7.4.3. Dispose of used sharp instruments in puncture-resistant containers.

7.5. Air abrasion, electro surgery units and lasers

7.5.1. High volume suction devices are vital when using electro surgery units, dental lasers and air abrasion/particle beam devices since they create specific bio-aerosol hazards. They create alumina dust, which can be a respiratory irritant.

7.5.2. Some pathogenic viruses are not inactivated by laser or electro surgery and remain viable in the plume produced from soft tissue vaporization. Most bacteria and viruses become non-viable by laser or electro surgery, even though fragments may exist in the plume, but this might insufficient in causing disease from airborne exposure, especially if the pathogen's usual method of transmission is not airborne. There is no proof that blood-borne viral diseases can be transmitted through aerosolization and inhalation of plume or other dental aerosols.

7.5.3. Using high-filtration surgical masks and high-volume suction can prevent inhalation of particles in plume. Plume also contains gases which are irritant and noxious so evacuation systems which remove plume vapour must be used.

7.6. Safe Handling of Extracted Teeth for Pre-Clinical Teaching/Research

7.6.1. Extracted teeth are considered infectious waste and should be handled precisely and with care. They are occasionally collected and used for preclinical educational training. The teeth should be cleansed of visible blood and gross debris, and upheld in a hydrated state. The teeth will be autoclaved before clinical teaching exercises, thus using an economical storage solution, such as water or saline for example, seems practical. A liquid chemical germicide (e.g., sodium hypochlorite [diluted 1:10 with tap water) could reduce bacterial accumulation during storage. However, it does not completely disinfect/sterilize the tooth. It is necessary to place the extracted teeth in a well-constructed container with a secure lid to prevent leaking during transport, and it should be labelled with the biohazard symbol.

7.6.2. Prior to being utilized in an educational setting, the teeth should be heat sterilized to ensure it is handled safely, and students enrolled in dental educational programs should still follow standard precautions. All individuals who collect and/or transport extracted teeth should follow the same precautions when handling them as they would for a specimen

for biopsy, as well as use the recommended PPE. Autoclaving teeth for preclinical laboratory exercises does not sufficiently alter their physical properties in order to enhance the learning experience. Although, autoclave sterilization of extracted teeth significantly affects dentinal structure to an extent where it also impacts dental materials research.

7.6.3. Using teeth that do not contain amalgam is preferred since they can be safely autoclaved. Extracted teeth containing amalgam restorations should not be heat sterilized due to the potential health hazard associated with possible mercury vaporization and exposure. If extracted teeth containing amalgam restorations are to be used, their immersion in 10% formalin solution for 2 weeks has been found to be an effective method of disinfecting both the internal and external structures of the teeth. Extracted teeth must be cleaned, wiped down with a disinfectant, and then rinsed with clean water before handed back to patients.

7.7. Single-Use (Disposable) Devices

7.7.1. Is to be used on a single patient during a single procedure. It is not intended to be reprocessed.

7.7.2. Using disposable items improves the safety of patients due to the elimination of patient-to-patient contamination, since the item is discarded rather than used on another patient once more. Any single-use device, or items used during oral surgical procedure, such as gauze,

irrigating syringes, syringe needles, and scalpel blades, should be sterile when being used.

7.7.3. Disposable patient-care items occasionally acquire reusable heat-tolerant alternatives such as high-volume evacuator tips, air and water syringe tips. In many instances, the reusable version of these items is hard to clean adequately. Thus, it is sometimes an easier, safer, and more cost-effective option to utilize the disposable version.

7.7.4. Most single-use (disposable) items used in dental settings can be discarded along with the regular waste. However, contaminated sharp items like needles, scalpel blades, and solid waste saturated with blood, would be considered medical waste.

7.7.5. DHCP should always refer to manufacturer instructions to determine if a device is categorized as a single-use item or not.

7.7.6. It's considered practical to deem devices such as burs, endodontic files, and broaches, as single-use, since the way they are constructed makes them difficult to clean. In addition, cleaning and heat sterilization could potentially lead to deterioration of the cutting surfaces, as well as raise the possibility of breakage during treatment.

7.8. Pre procedural Mouth Rinses (PPMRs)

7.8.1. There is no published evidence regarding the clinical effectiveness of PPMRs to reduce SARS-CoV-2 viral loads or to prevent transmission. Hence, no recommendation has been proposed regarding the use of pre-

procedural antimicrobial mouth rinses to prevent clinical infections amongst DHCP or patients. Although COVID-19 was not studied, PPMRs with an antimicrobial product (e.g., chlorhexidine gluconate, essential oils, or povidone-iodine) can reduce the level of oral microorganisms in aerosols and spatter generated during dental procedures, and can also decrease the number of microorganisms introduced in the patient's bloodstream during invasive dental procedures. The scientific evidence is thus inconclusive.

7.9. Specimens

7.9.1. In order to protect individuals handling and transporting biopsy specimens, each one should be placed in a sturdy, leak-proof container labelled with the biohazard symbol.

7.9.2. Gloves must also be worn when handling pathology specimens as well as specimen containers. Moreover, the specimen should be packaged in a sealed container to prevent leakage during transport.

7.9.3. Appropriate biohazard labelling must be placed on the pathology specimen containers before dispatch. The use of plastic zipper bags is preferred when carrying the appropriate designation provided by the pathology laboratory.

7.9.4. If a biopsy specimen container is visibly contaminated, it is required to clean and disinfect the container’s exterior before placing it into the transport bag or container.

7.10. Impressions

7.10.1. Thorough rinsing with cold running water is designed to remove saliva and traces of blood. This is followed by immersing or spraying a diluted detergent, which has a surfactant action; it removes remaining microorganisms from the impression.

7.10.2. Further rinsing is then required to remove the detergent until all visible contamination is eliminated.

7.11. Curing light

7.11.1. Curing light tips are semi-critical pieces of equipment. They should either be heat sterilized, or contain a suitable barrier over the tip for each patient. Another advantage of a barrier is that the sensitive light-conducting rods are protected from accidental damage or material contamination. It is necessary to ensure the handle of the curing light, as well as the tips are continuously cleaned prior to using a new barrier to placing them barriers over the tip.

7.12. Gutta percha

7.12.1. Gutta percha points can be disinfected by immersing it in 5.25% sodium hypochlorite solution for a period of one minute immediately before its usage.

7.13. Hand operated endodontic files

7.13.1. It is ineffective and unsafe to reprocess hand files since they are typically labelled as single-use items, and thus are likely to result in a sharp injuries if practiced.

7.14. Nickel-titanium (NiTi) endodontic files

7.14.1. For NiTi files, a protocol combining a specific enzymatic agent with ultrasonic cleaning has been developed. This protocol has proven to be effective for all types of rotary NiTi endodontic files. It uses a combination of mechanical and chemical removal of debris from the files, followed by pre-soaking it in an enzymatic agent, as well as ultrasonic cleaning.

7.14.2. Cleaning rotary NiTi endodontic files:

a. Immediately after use, remove the stoppers and insert the files into a scouring sponge soaked with chlorhexidine gluconate aqueous solution.

b. Clean the files using 10 vigorous in-and-out strokes in the sponge.

c. Place the files in a wire mesh basket, and immerse it in a suitable enzymatic cleaning solution for 30 minutes, followed by being treated by the ultra-sonic cleaner in the enzymatic cleaning solution for another 15 minutes.

d. Drain and rinse it in running water for 20 seconds.

e. Proceed to steam sterilization.

7.14.3. A dental practice intending to reprocess rotary NiTi endodontic files should strictly follow the protocol mentioned above. If a dental practice quarantines rotary files for a patient's course of treatment for a single tooth, this validated protocol should be followed. Moreover, reprocessing root canal files is for NiTi files only, rather than for stainless steel files, which must be single-use.

7.15. Dental radiology

7.15.1. Items or materials placed in a patient's mouth and subsequently removed for processing should be considered as biologically contaminated, and so must be handled in a safe manner. Gloves must be worn when taking radiographs and handling contaminated film packets or sensors.

7.15.2. Transportation and careful handling of the exposed radiographs is required to avoid contamination of the developing equipment.

7.15.3. Following the exposure of the radiograph, the film packet should be dried with a paper towel to remove blood or excess saliva before placing it in a container (such as a disposable cup) for transportation to the developing area.

7.15.4. Always try to maximize the amount of protective barriers used on developing equipment, and ensure surfaces are always cleaned when contaminated.

7.15.5. Both contaminated radiography equipment (e.g. radiograph tube head and control panel), as well as the application of barrier protection, must be cleaned after being used on each patient. Digital radiography sensors come into contact with mucous membranes and are considered semi-critical devices, which need to be cleaned and covered with a barrier before being used on subsequent patients.

KEY PERFORMANCE INDICATORS (KPIs)

1. Patient Happiness: Overall Assessment	
DHA Pillar	Patient Happiness
Indicator Name	Overall Assessment
Measure Type	Outcome
Data Source	Survey data
Measure Description	People who had a very favorable overall assessment of the facility during measurement period
Measure Denominator	All survey respondents who meet inclusion criteria
Measure Numerator	Survey respondent whose overall assessment of the facility was very high - patients with the highest possible score (scale has 2-7 options) or the two highest options (scale has 8+ options)
Measure Inclusion Criteria	Total number of valid responses to surveys that ask a patient to give their overall assessment of a facility
Measure Exclusion Criteria	None
Source	DHA
International Benchmark	None: Dubai facility surveys are not sufficiently uniform to allow benchmarking
Higher is Better	Yes
Risk Adjust This Measure	No

2. Patient Happiness: Recommendation to Others	
DHA Pillar	Patient Happiness
Indicator Name	Recommendation to Others
Measure Type	Outcome
Data Source	Survey data
Measure Description	Percentage of patients who were very likely to recommend the facility to other people during measurement period
Measure Denominator	All survey respondents who meet inclusion criteria
Measure Numerator	Survey respondent whose recommendation was very high - patients with the highest possible score (scale has 2-7 options) or the two highest options (scale has 8+ options)
Measure Inclusion Criteria	Total number of valid responses to surveys that ask whether the patient would recommend the facility to others
Measure Exclusion Criteria	None
Source	DHA
International Benchmark	None: Dubai facility surveys are not sufficiently uniform to allow benchmarking
Higher is Better	Yes
Risk Adjust This Measure	No

3. Patient Happiness: Doctors Made Sure Patient Understood All Information	
DHA Pillar	Patient Happiness
Indicator Name	Doctors Made Sure Patient Understood All Information
Measure Type	Outcome
Data Source	Survey data
Measure Description	Percentage of patients who answered favorably ('yes') that doctors made sure he/she understood all information
Measure Denominator	All survey respondents who met inclusion criteria
Measure Numerator	Survey respondent indicated 'yes,' doctors made sure that the patient understood all information
Measure Inclusion Criteria	Valid response to the survey question ('yes' or 'no')
Measure Exclusion Criteria	None
Source	DHA
International Benchmark	None: Dubai facility surveys are not sufficiently uniform to allow benchmarking
Higher is Better	Yes
Risk Adjust This Measure	No

4. Patient Safety: Rate of Medication Error	
DHA Pillar	Patient Safety
Indicator Name	Rate of Medication Error
Measure Type	Outcome
Data Source	Internal facility records, reports, or survey data
Measure Description	Rate of prescriptions per 100,000 with a dispensing error during measurement period
Measure Denominator	Number of medication prescriptions during measurement period
Measure Numerator	Number of prescriptions in which a medication error occurs (e.g. dispensing error, prescribing error, administering and preparing error, patient compliance error, vaccine error, administering a medicine for a known allergy patient, dose-related adverse drug reaction)
Measure Inclusion Criteria	All filled prescriptions
Measure Exclusion Criteria	Unsafe condition and near miss incident, adverse drug reactions
Source	TEC required measures http://apps.who.int/iris/bitstream/10665/252274/1/9789241511643-eng.pdf
International Benchmark	2.28 Per 100,000 (in the U.S.) Source: https://www.nationwidechildrens.org/newsroom/news-releases/2017/07/study-finds-rate-of-medication-errors-resulting-in-serious-medical-outcomes-rising . One medication error occurs for every five doses given in US hospitals and 1-2% of patients admitted to US hospitals are harmed by medication errors. Source: http://stateclaims.ie/wp-content/uploads/2017/11/Medication-Incidents-Report-2016.pdf
Higher is Better	No
Risk Adjust This Measure	No

5. Patient Safety: Rate of Medical Error	
DHA Pillar	Patient Safety
Indicator Name	Rate of Medical Error
Measure Type	Outcome
Data Source	Internal facility records, reports, or survey data
Measure Description	Rate of medical errors (errors in diagnosis, medication, surgery, equipment use, lab findings interpretation) per 100,000 patients in measurement period
Measure Denominator	All qualifying patients in measurement period
Measure Numerator	Medical errors as defined through proven reports (e-medical systems) during measurement period
Measure Inclusion Criteria	All patients with at least one medical encounter in measurement year
Measure Exclusion Criteria	None
Source	TEC required measures http://apps.who.int/iris/bitstream/10665/252274/1/9789241511643-eng.pdf
International Benchmark	To be discussed with DHA
Higher is Better	No
Risk Adjust This Measure	No

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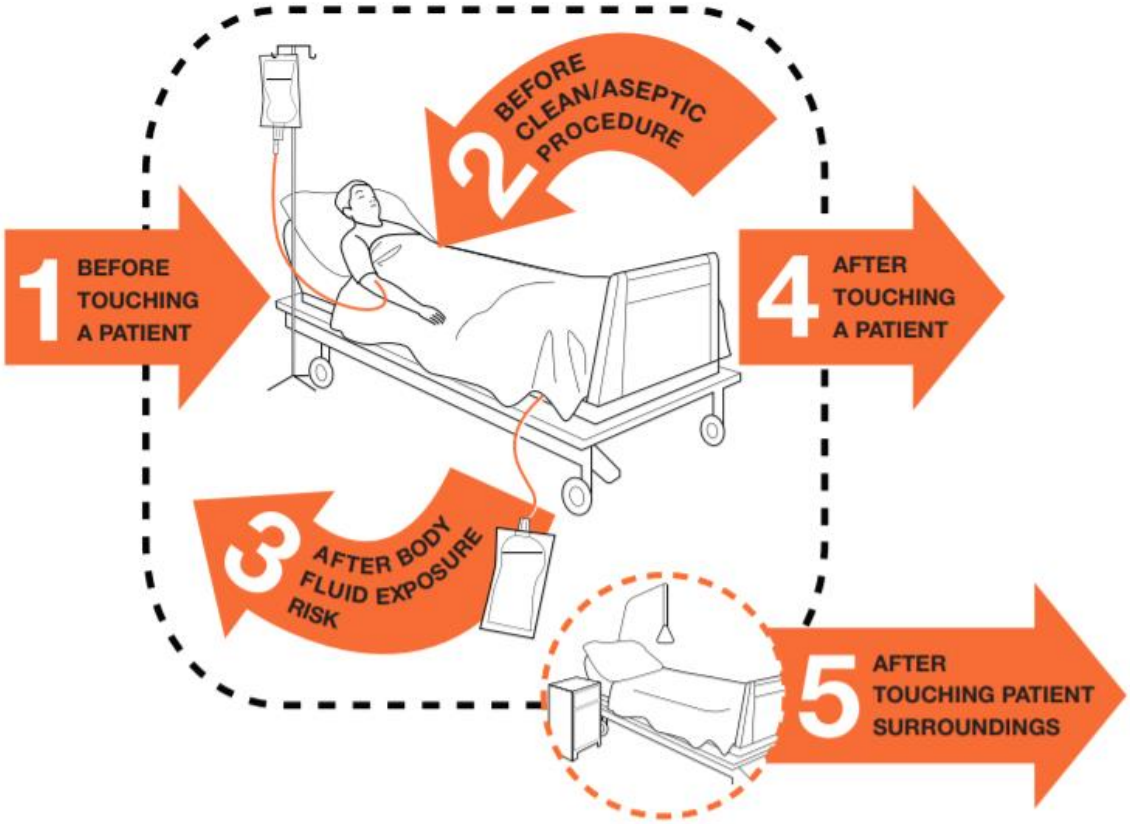
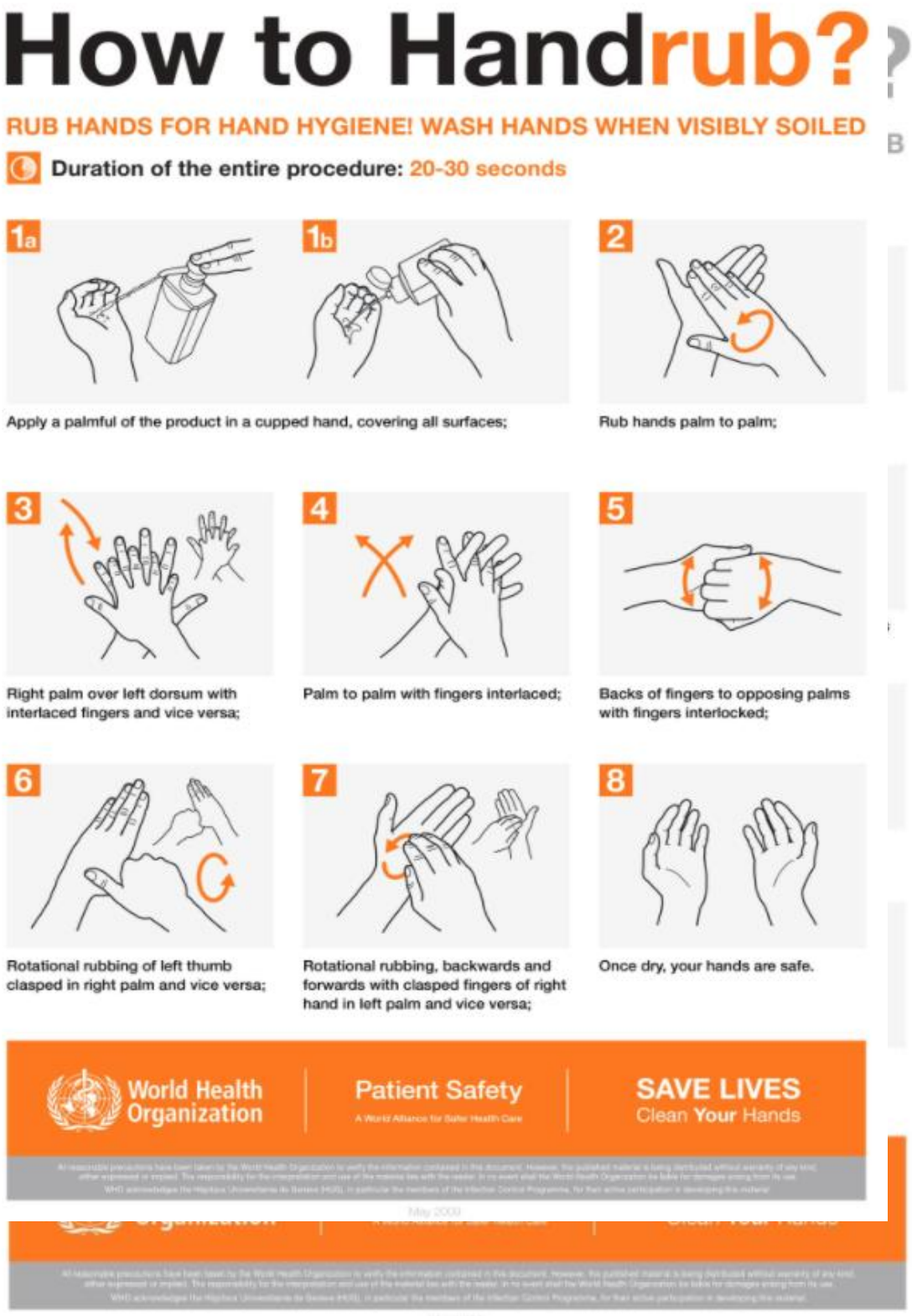
APPENDICES

APPENDIX 1: INDICATIONS FOR HAND HYGIENE (WHO 5 MOMENTS OF HAND HYGIENE)



1	BEFORE TOUCHING A PATIENT	WHEN?	Clean your hands before touching a patient when approaching him/her.
		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 an exposure risk to body fluids (and after glove removal).
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
4	AFTER TOUCHING A PATIENT	WHEN?	Clean your hands after touching a patient and her/his immediate surroundings, when leaving the patient's side.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
5	AFTER TOUCHING PATIENT SURROUNDINGS	WHEN?	Clean your hands after touching any object or furniture in the patient's immediate surroundings, when leaving – even if the patient has not been touched.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.

APPENDIX 2: HAND HYGIENE STEPS



APPENDIX 3: DUBAI MUNICIPALITY (DM) GUIDELINE ON DENTAL UNIT WATERLINES TESTING

Parameters	Acceptable Range	Frequency of Testing	Site
HPC (Heterotrophic Plate Count)	< 200 CFU (Colony Forming Unit)	Monthly	Hand pieces, ultrasonic scaler, A/W syringe, cup filler
Legionella	0	Quarterly	Hand pieces, ultrasonic scaler, A/W syringe, cup filler

CFU/mL (Colony-Forming Unit per millilitre): It is the minimum number of separable cells that gives rise to visible growth, may consist of pairs, chains, and clusters as well as single cells.

- If microbial count exceeds 200 CFU/mL, re-evaluate the technique, re-treat; and re-test dental unit waterlines and maintain records.
- If presence of legionella is detected or HPC count is above 200 CFU/ml, consider using an alternative water delivery system for the dental chair based on manufacturer's recommendation.
- Water treatment should commence as soon the water test results are abnormally detected.

APPENDIX 4: CLASSIFICATION WASTE GENERATED IN HEALTH CARE FACILITY

Category	Waste Classification	Description	Collection, Storage, Transportation
MEDICAL WASTE	**Group A**	Anatomical and pathological waste	BAG COLOUR : RED
	Group B	Sharp Objects	BOX COLOUR :YELLOW (single-use sharps container)
	Group C	Laboratory Waste	BAG COLOUR : Autoclavable bag (blue or Transparent) Must be packaged in Yellow BAG after autoclaving.
	Group D	D1: Pharmaceutical waste	BAG COLOUR : Yellow
		D2: CMR Waste, including cytotoxic and cytostatic medicines and waste	BAG COLOUR :YELLOW Marked as Cytotoxic/ Cytostatic waste"
		D3: Chemical Waste	BAG COLOUR :YELLOW Chemical wastes shall be segregated and returned to the concerned department where they shall be tagged according to their type. Tags and marks placed on each pack shall indicate its components and hazards. Individual containers shall then be placed in yellow bags or containers and stored in a locked room until collection and disposal.
	Group E	Patient Care Waste	BAG COLOUR: Yellow
	Group F	Radioactive Medical Waste	Collection in medium duty bags or containers, clearly labelled with "Radioactive Waste" and the radioactive hazard symbol (see picture). All collection, storage and transportation must be in compliance with relevant FANR Regulations, particularly FANR Regulation for Radiation Protection and

			Predisposal Radioactive Waste Management in Nuclear Facilities (FANRREG- 11).
GENERAL WASTE		Domestic Waste and Recyclable waste	BAG COLOUR: BLACK
DENTAL AMALGAM WASTE		Contact and Non-Contact Amalgam Waste	Airtight container labelled as Biohazard Waste for: - Contact Amalgam - Non- Contact Amalgam *Disposal: Waste Management Unit accordingly to local regulation