Guidelines On Infection Control in Dental Practice

Dental Services Division
Ministry of Health
Malaysia
1996
INFECTION CONTROL
IN DENTAL PRACTICE

Dental Services Division,
Ministry of Health Malaysia.
These guidelines on "Infection Control in Dental Practice" was prepared by a committee of dental consultants and officers from the different specialties in the Ministry of Health, Malaysia. It is to be used as a source of reference to assist related personnel in adhering to current accepted protocols on infection control in the dental surgery.

The emergence of more virulent strains of organisms with the ever-present threat of exposure to cross contamination, especially pertaining to transmission of diseases such as Hepatitis and HIV/AIDS, makes it imperative that every dental personnel be educated on, and practise universal precautions and effective infection control procedures. It is pertinent at this juncture that we remind ourselves of the three most likely routes of disease transmission in the dental surgery - (i) from dentist to patient, (ii) from patient to dentist and (iii) from patient to patient.

On the global scene, populations infected with HIV/AIDS has risen from year to year. The scenario in Malaysia is no exception. This trend has led to the unfortunate need to regard every client as a potential source of contamination. It is thus a moral obligation and the responsibility of all oral health care providers to implement and practise universal precautionary measures. This will ensure that clients receive quality oral health care in an environment made safe for providers and clients alike.

Dr. Hjh. Fawziabt. Dato' Abdullah,
Director of Dental Services, Ministry of Health, Malaysia.
INFECTION CONTROL IN DENTAL PRACTICE

1. INTRODUCTION

All members of the dental team must ensure that they practise universal precautions to protect both their patients and themselves. The only safe approach is to assume that all patients are potential sources of infections. This document serves to provide guidelines to minimise or eliminate the risk of cross infection in the context of dental practice. Relevant appendices are included for easy reference.

INFECTION CONTROL SHOULD NOT BE COMPROMISED

2. RECOMMENDATIONS

2.1 MEDICAL HISTORY

A thorough medical history should be taken from all patients and updated from time to time. Specific questions regarding medication, current illness e.g. hepatitis or other infections must be asked.

Medical history helps but should not be relied on totally

22. PROTECTIVE ATTIRE

(i) Gloves must be worn by both operator and assistant when examining and treating patients or when any dental personnel is exposed to blood body fluids and other clinical debris.

(ii) Disposable surgical masks must be worn in clinical situations in the dental surgery.

(iii) Goggles or face shields should be worn by the operator and assistant when aerosols, splashes or dust is being produced.

(iv) Laboratory coats. reusable or disposal gowns must be worn.

(v) Plastic wrap, aluminum foil or impervious-backed paper may be used to cover surfaces that are difficult or impossible to disinfect e.g. light handles or x-ray unit heads.

(vi) Rubber dams, high volume aspirators and good ventilation can reduce the risk of cross infection.
2.3. HANDWASHING AND CARE OF HANDS

Hands must always be washed between patients, after handling objects contaminated with blood or saliva and before leaving the surgery.

2.4. SHARP INSTRUMENTS, NEEDLES AND OTHER DISPOSABLES

(i) Disposable needles and scalpel blades should always be used. THEY SHOULD NEVER BE REUSED FOR ANOTHER PATIENT.

(ii) Needles, scalpel blades and other sharp instruments should be considered as potentially infective. Avoid injuries. Avoid recapping or bending of needles due to the high risk of needlestick injury.

(iii) Partly used local anaesthetic cartridges may contain blood from the patient and roust never be reused for another patient.

(iv) Disposable syringes and needles, scalpel blades and other sharp items must be placed in puncture-resistant containers.

(v) Use disposable items when available.

2.5. STERILISATION AND DISINFECTION

All instruments should be sterile or have received high level disinfection at the time of use. Sterilisation and disinfection techniques include physical, chemical and gaseous means e.g. autoclaves, hot air oven and hypochlorite solutions. The use of ultrasonic cleaners for the proper maintenance of small and delicate instruments is recommended.

All instruments must be thoroughly cleaned (scrubbed with soap and water or detergent) to remove visible debris before sterilisation.

Sterilisation and disinfection techniques in use must be tested for its efficacy on a regular basis.

Note: Ensure that autoclaves are certified safe for use and that there is regular verification of adequacy of sterilisation.

2.6. HANDPIECES

All handpieces should be sterile at time of use. If this is not possible, the handpieces should be appropriately disinfected. Most handpieces can be flushed after each use, then thoroughly wiped with absorbent materials saturated with an appropriate disinfectant. The disinfectant should remain in contact with the handpiece for the time specified.
2.7. SURGERY DECONTAMINATION

Environmental Decontamination

A high level of general cleanliness must be maintained in the dental surgery. Working surfaces, bracket tables and countertops should be disinfected. The use of sterilisable trays or disposables are recommended. Flours, walls, ceilings and sinks must be routinely cleaned. All spilt blood or body fluids should be attended to immediately.

Dental Equipment Decontamination

2.8. LABORATORY MATERIALS

Impressions and appliances contaminated with blood and saliva should be thoroughly rinsed and disinfected before being sent to the laboratory.

If an impression need to be transported to a distant laboratory, place it in a sealed plastic bag. Preferably, all impressions should be poured on site. Dental technicians are encouraged to wear gloves when handling impressions, prostheses and when pouring models.

2.9. BIOPSY SPECIMENS

Each specimen should be placed in a sturdy container with 10% formal saline and sealed to prevent leakage. Avoid contamination on the outside with blood or other fluids. All specimens must be handled as biohazardous.

2.10. DISPOSAL OF CLINICAL WASTE

All clinical waste should be regarded as biohazardous and rendered safe prior to disposal. Sharp items e.g. needles and scalpels should be placed in rigid, puncture-resistant containers.

2.11. OCCUPATIONAL EXPOSURE

Any dental worker exposed to needle stick injury, splashes or cuts during the course of work should immediately inform the Dental Officer-in-charge so that appropriate measures may be instituted. It is the responsibility of a dental worker who is a known carrier of a communicable disease or infection to make the fact known to the dental officer in-charge. All dental personnel should be vaccinated against Hepatitis B and their level of immunity maintained.
APPENDICES

I. Handwashing
II. Methods for Sterilisation and High-Level Disinfection
III. Sterilisation and Disinfection of Dental hems
IV. Care of Handpieces
V. Dental Surgery and Equipment Decontamination
VI. Management of Spilt Blood and Body Fluids
VII. Handling of Tissue/Specimens
VIII. Infection Control in the Dental Laboratory
IX. Disposal of Clinical Wastes
X. Protocol for management of Post-Occupational exposure
HANDWASHING

HAND HYGIENE POLICY

Hand hygiene remains the single most effective and economical means of controlling infection. It is therefore essential that before carrying out and after completing any procedure or patient care activity, hands should be adequately cleaned.

TYPES OF HANDWASHING

1. SOCIAL HANDWASHING
   - this should be carried out for personal hygiene.

2. HYGIENIC HANDWASHING
   Should be used when an aseptic procedure is to be carried out.
   Wash before:
   (a) Performing oral procedures-conservative, prosthetic and oral surgery.
   (b) Caring for patients in isolation.
   (c) Touching wounds of any kind.
   Wash after:
   (a) Situations likely to cause microbial contamination such as contact with blood or body fluids, secretions or excretions. (NB: Gloves should be used in these situations; handwashing is still required).
   (b) Touching sources likely to be contaminated with epidemiologically important micro-organisms (including urine measuring devices and secretion collection apparatus).
   (c) Caring for patients infected or colonized with certain epidemiologically important bacteria e.g. methicillin-resistant S aureus and gentamicin-resistant K pneumoniae.
   (d) Physical contact with each patient.
   (e) Touching wounds of any type.

Use alcohol rub (or wash) between contact with different patients in high risk areas.
3. **SURGICAL HANDWASHING**

Meticulous cleaning of the hands, which includes the use of a nailbrush in the first scrub of the morning, consists of a 3 minute scrub up to the forearm and dried with a sterile towel. Usually accompanied by wearing sterile gloves. Subsequent scrubs consist of 2 minute wash only.

**HAND WASHING AGENTS**

All hand disinfection agents should be kept in a dispenser that delivers a measured quantity of soap or disinfectant. The container and nozzle must be cleaned regularly to prevent contamination and clogging. Containers of disinfectant should not be left open.

**Liquid Soap**

Soap & water remove most organic contamination and are acceptable as a social hand wash.

NB. Bar soap which incorporates a bactericidal agent can be used as an alternative for staff members who are allergic to antiseptic handwashing agents. If bar soap is used it should be stored dry.

2. **Antiseptic Handwash**

Aqueous antiseptic handwash is used to remove organic contamination and repeated use maintain low bacterial hand-counts. This is recommended prior to an aseptic technique. Allergy can develop to these disinfectants, although the most common reason for 'allergy' is inadequate drying of the hands. Hand creams should only be applied at the end of the shift. Some users are genuinely allergic to chlorhexidine and alternatives (e.g. povidone iodine) may be used. If bar soap is recommended, it should be supplemented with an alcohol rub prior to carrying out an antiseptic procedure.

2.1. **Chlorhexidine**

Studies have indicated that chlorhexidine handwash is more effective than povidone iodine. The recommended antiseptic handwash is 2-4% chlorhexidine gluconate with 4% isopropyl alcohol in a detergent solution of pH S.U-8.5.
2.2. **Povidoneiodine**

Products containing 7.5% to 10% povidone iodine in a surgical handscrub should be used.
Scrub hands in two consecutive 3 minutes duration.

2.3. **Alcohol-based disinfectants (alcohol rub)-Ethyl alcohol, isopeopyl alcohol**

Alcohol based disinfectants are extremely useful and are excellent means of providing hand disinfection in areas where washing facilities are lacking.

**HAND DRYING**

Drying is an essential part of hand disinfection. Wet hands have higher bacterial counts and permanently wet hands become chapped and dry.

Paper towels are most often used to dry hands.

Air hand dryers are not recommended in clinical areas because there is a risk of bacterial dispersal from aerosols.
1. Do not treat or examine without loves.
2. Handwashing is to be carried out before gloving.
3. Use disposable gloves.
4. Change gloves between patients.
5. Change gloves if there is evidence of perforation.
6. Use occlusive dressings on cuts or abrasions before gloving.
7. When carrying out any surgical procedure, sterile surgical gloves should be used. Double gloving is recommended.
8. All personnel involved in the treatment or handling of the patient (close support dental surgery assistants) must be gloved.
9. Staff involved in cleaning dirty instruments should wear heavy-duty gloves.
10. Elbow taps should be made available in the dental surgery.
EFFECTIVE HAND HYGIENE

1. Palm to palm.

2. Right palm over left dorsum and left palm over right dorsum.

3. Palm to palm fingers interlaced.

4. Back of fingers to opposing palms with fingers interlocked.

5. Rotational rubbing of right thumb clasped in left palm and vice versa.

6. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.
METHODS FOR STERILISATION
AND HIGH-LEVEL DISINFECTION

Sterilisation is defined as the destruction of all microbes, including bacterial spores. High-level disinfection is defined as the destruction of all microbes, but spores may survive if initially in large numbers.

Methods commonly used in the dental clinics:
1. Steam sterilisation
2. Dry heat
3. High level disinfection by:
   1. Soaking in chemicals
   2. Boiling
4. Low to Medium level disinfection

1. STEAM STERILISATION

Steam sterilisation (autoclaving) is the recommended method for reusable dental instruments. The autoclave should be operated according to the manufacturer's recommendations. All autoclaves must be tested for efficacy fortnightly by the use of biological indicators to ensure that the contents of the load have been subjected to sterilisation conditions.

2. DRY HEAT

Sterilisation by dry heat in an electric oven is an appropriate method for instruments that can withstand high temperature of 170°C or 340°F. It should be used according to manufacturer's recommendation.

3. HIGH-LEVEL DISINFECTION

3.1. High-level disinfection by soaking in chemicals

Immersion of dental instruments in a chemical disinfectant for a specific period of time has been shown to confer high level disinfection.

For chemical disinfectants to be reliable the following should be adhered.

(a) The disinfectant solution should be properly prepared according to the manufacturer's instructions.
(b) Instruments must be soaked for the specified period of time.
(c) All instruments should be free of debris prior to soaking.
(d) There should be sufficient volume of the solution to ensure that all the instruments are totally immersed.

(e) Prior to use or storage, the instruments should be thoroughly rinsed with water.

(f) Discard disinfectant solution in accordance with the manufacturer's instructions.

Solution used is gluteraldehyde @ gluteraldehyde 2%.

A commonly used high level disinfectant is Gluteraldehyde. Gluteraldehyde is usually available as a 2% aqueous solution that needs to be activated before use. Activation involves addition of a powder or a liquid buffer supplied with the solution; this renders the solution alkaline. They give off a toxic, irritant vapour which operators should avoid. Skin contact with the liquid should also be avoided.

3.2. **High-level disinfection by boiling**

A high level of disinfection is achieved when instruments are boiled for 20 minutes. This is a simple method for inactivating most pathogenic microbes when sterilisation equipment is not available. To achieve high level disinfection:

(a) Boiling should be at 100°C for at least 20 minutes.

(b) Instruments should not be added during the boiling cycle.

**LOW TO MEDIUM LEVEL DISINFECTION**

4.1. **Sodium hypochlorite**

Sodium hypochlorite solutions (e.g., liquid bleach), are excellent immediate to low-level disinfectants. They are bactericidal, virucidal, inexpensive and widely available. Concentrations ranging from 5000 ppm (1:10 dilution) to 500 ppm (1:100 dilution) are effective depending on the amount of organic material present. However, they have two important disadvantages.

- They are corrosive. They will corrode nickel and chromium steel, iron and other oxidizable metals. Contact should not exceed 30 minutes. Dilutions should not be prepared in metallic containers as they may corrode rapidly.
- They deteriorate. Solutions should be recently manufactured and protected in storage from heat and light. Dilutions should be prepared just before use.
The disinfectant power of all chlorine-releasing compounds is expressed as "available chlorine" (% for solid compounds: % or parts per million (ppm) for solutions) according to the concentration level. Thus, 0.0001 % = 1 mg/litre = 1 ppm and 1% = 1 g/litre = 10000 ppm.

<table>
<thead>
<tr>
<th>Recommended Dilutions of Sodium Hypochlorite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&quot;Dirty&quot; Conditions</strong> (for flooding the surface prior to removal bulk material)</td>
</tr>
<tr>
<td>Available chlorine required</td>
</tr>
<tr>
<td>Dilution</td>
</tr>
<tr>
<td>Sodium hypochlorite solution (5% available chlorine)</td>
</tr>
</tbody>
</table>

4.2. **Ethanol and 2-propanol**
Ethanol (ethyl alcohol) and 2-propanol (isopropyl alcohol) have similar disinfectant properties. They deactivate vegetative forms of bacteria, mycobacteria, fungi and viruses after few minutes of contact. They are not effective against bacterial spores. For highest effectiveness they should be used in a concentration of approximately 70% alcohol by volume.

4.3. **Povidone iodine (PVI)**
Povidone iodine (PVI) is an iodophore (a compound that carries iodine) and can be used in aqueous solution. PVI has multiple mechanisms of action, including surfactant (wetting) activity. It is commonly formulated as a 10% solution (1°Io iodine). It can be used diluted to 2.5% PVI (1 part 10% solution to 3 parts boiled water). There are problems of allergy in some people.

4.4. **Habitane**
The human immunodeficiency (HIV) and Hepatitis B virus can be transmitted from one person to another through the use of non-sterile instruments. Correct sterilisation and disinfection of all instruments in a dental surgery setting is therefore important to prevent transmission of the viruses. Methods of sterilisation and high level disinfection designed to inactivate Hepatitis B virus will also inactivate HIV.

HIV has been found in various body fluids from person infected with the virus. However, only blood, semen, and vaginal/cervical secretions have been implicated in HIV transmission. Nevertheless, as all body fluids including pus may contain blood or white cells, it is essential that all dental instruments should be sterilised or given high-level disinfection.
## METHOD OF STERILISATION AND DISINFECTION

<table>
<thead>
<tr>
<th>Method</th>
<th>Temp</th>
<th>Duration</th>
<th>Indication</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoclave</td>
<td>Steam under</td>
<td>134/138°C</td>
<td>3.5 min (plus 17 min drying time)</td>
<td>Sterilisation of most metal/stainless steel instruments, autoclacable handpieces. Cloth goods (gauze, cotton, wool, cotton rolls, paper points, heat resistant plastic items)</td>
</tr>
<tr>
<td>Cassette autoclave</td>
<td>Steam without air</td>
<td>121/124°C</td>
<td>15 min (plus 17 min drying time)</td>
<td>Most instruments-unwrapped Most instruments-wrapped</td>
</tr>
<tr>
<td></td>
<td></td>
<td>135-138°C</td>
<td>6 mins 12 mins</td>
<td></td>
</tr>
<tr>
<td>Hot air oven</td>
<td>Dry heat</td>
<td>170°C</td>
<td>1 hour</td>
<td>Sterilisation of most metal/stainless steel instruments. Most suitable for metal amalgam carrier and RCT instruments which should be in dry condition at all times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160°C</td>
<td>2 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>120°C</td>
<td>5 hours</td>
<td>Sterilisation of gauze, cotton wool and paper point</td>
</tr>
<tr>
<td>Method</td>
<td>Temperature</td>
<td>Time</td>
<td>Description</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------</td>
<td>--------</td>
<td>---------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Rapid dry heat oven</td>
<td>190° C</td>
<td>6 min</td>
<td>Sterilisation of most metal instruments-unwrapped</td>
<td>Small load size should not be used for instruments with sharp cutting edges.</td>
</tr>
<tr>
<td>Circulating hot air</td>
<td>190° C</td>
<td>12 min</td>
<td>Sterilisation of most metal instruments-wrapped.</td>
<td></td>
</tr>
<tr>
<td>Glass Bead/Salt Steriliser</td>
<td>218-246° C</td>
<td>Minimum 15 seconds</td>
<td>Sterilisation of endodontic instruments.</td>
<td>Only for very small instruments. Temperature has to be constantly monitored.</td>
</tr>
<tr>
<td>Boiling water</td>
<td>100° C</td>
<td>20 min</td>
<td>High level disinfection of metal instruments.</td>
<td>Ineffective against spores. Absence of door-locking system allows interruption of continuous boiling.</td>
</tr>
<tr>
<td>Name of Chemical</td>
<td>Concentration</td>
<td>Duration or contact time (immersion)</td>
<td>Indication (Destroys resistant pathogenic spore)</td>
<td>Use life or proposed solution</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>2% Glutaraldehyde Preparation e.g. Cidex</td>
<td>Full strength</td>
<td>10 min</td>
<td>High level disinfection of most metal/stainless steel instruments. Effective against vegetative bacteria but not including spores. Intermediate level including mycobacterium tuberculosis. Disinfection, effective against vegetative bacteria including spores.</td>
<td>14-28 days</td>
</tr>
<tr>
<td>2% Glutaraldehyde-phenate e.g. Sporicidin</td>
<td>Full strength 1:16 dilution</td>
<td>10 mins 10 mins</td>
<td>Sterilisation, effective against Hepatitis B. High level disinfectant of metals/stainless steel instruments, rubber and plastic.</td>
<td>30 days</td>
</tr>
<tr>
<td>5% Chlorhexidine</td>
<td>1:1000 1:5000 1:200 in 70%</td>
<td>30 mins (immersion)</td>
<td>Medium level disinfection of instruments. Disinfection of working surfaces and dental chairs. Antiseptic.</td>
<td>14 days</td>
</tr>
<tr>
<td>4% Chlorhexidine e.g. Hibiscrub, Hibiclens</td>
<td>1:10</td>
<td>3 mins 5 mins</td>
<td>Handwashing Surgical handscrubbing</td>
<td>Effective handwashing agent.</td>
</tr>
<tr>
<td>Name of Chemical</td>
<td>Concentration</td>
<td>Duration (Destroys resistant patho)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>