

THE NEW ZEALAND DENTAL ASSOCIATION  
AND  
THE DENTAL COUNCIL OF NEW ZEALAND

CODE OF PRACTICE

CONTROL OF CROSS INFECTION  
IN DENTAL PRACTICE

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Contents

Purpose of the Code of Practice	1
Introduction	1
The dentist's responsibilities	2
Work methods	3
Sterilisation vs disinfection	4
Environmental surfaces	5
Instrument re-processing	5
Instrument pre-packaging	6
Sterilisation of instruments	7
Validation	8
Waste disposal	9
Contaminated items for dispatch	9
Appendices:	10
<i>Procedure following needle-stick injury</i>	
<i>The selection of cleaning agents</i>	
<i>Technique for disinfecting surfaces</i>	
<i>Method for manual and mechanical cleaning</i>	
<i>Water lines and suction units</i>	
Further reading	16
Compliance checklist	17

## 1 Purpose of the Code of Practice

- 1.1 The purpose of the **New Zealand Dental Association/Dental Council of New Zealand joint Code of Practice – Control of Cross-Infection in Dental Practice** (COP) is to protect patients and dental health care personnel against the risks of cross-infection in the dental surgery environment. The major risk is the repeated exposure to blood and/or saliva, which may be contaminated with any of a wide variety of microorganisms including the transmissible major viral infections; Hepatitis B, C and HIV. For a review of the transmissible major viral infections in the dental setting the reader is referred to the **New Zealand Dental Association/Dental Council of New Zealand joint Code of Practice – Transmissible Major Viral Infections**.

## 2 Introduction

- 2.1 Patients carrying blood and/or saliva-borne disease may be asymptomatic and unaware of their carrier or infectious status and medical histories alone cannot reliably identify all carriers of transmissible disease. The provision of dental care frequently involves exposure-prone procedures that create risks from:
- contact of skin and mucous membranes with contaminated body substances, particularly blood and/or saliva; and
  - production of aerosols containing micro-organisms.
- 2.2 Dental procedures therefore have the potential risk of cross-infection – that is, the transmission of disease from patient to patient or patient to clinician.
- 2.3 In addition to professional and ethical obligations relating to the prevention of cross-infection, the dentist is bound by relevant legislation and applicable national standards. The **Health and Safety in Employment Act 1992** requires that a dentist **must**:
- provide and maintain a safe working environment; and
  - ensure that employees and other persons who may enter the workplace are not exposed to identifiable hazards; and
  - identify any potential hazards to both staff and patients; and
  - eliminate, reduce or minimise the effect of any identifiable hazard; and
  - develop procedures for dealing with emergencies.
- 2.4 The overarching principle embodied in this COP is the use of universal precautions and procedures for protecting both clinicians and patients against cross-infection. Fundamentally, the precautions are based on regarding the blood, saliva and other body substances of **all** persons as potential sources of infection, independent of diagnosis or perceived risk. Universal precautions and procedures are the most effective method of reducing the risk of cross infection in dental care.
- 2.5 Every dentist is responsible for implementing this COP. The COP requires all staff in a dental practice to be thoroughly trained and fully informed of the contents of the COP, and copies of it **must** be available on-site. Practice procedures for infection control should be reviewed on a regular basis to ensure that the minimum standards set out in this COP are met.
- 2.6 This New Zealand Dental Association/Dental Council of New Zealand joint Code of Practice is consistent with the **Australian and New Zealand standard AS/NZS 4815:2006 “Office-based health care facilities – reprocessing of reusable medical and surgical instruments and equipment, and the maintenance of the associated environment”** and this document is fully acknowledged in the Code of Practice.

### **3 The dentist's responsibilities**

#### ***Medical history of patient***

- 3.1 At the patient's initial appointment, the dentist **must** obtain a thorough and relevant medical history of the patient. This history **must** be reviewed and if necessary updated at subsequent visits as appropriate. The medical history will assist in determining health disorders relevant to proposed dental treatments, but it cannot be relied on to identify patients who are asymptomatic carriers of transmissible diseases and who are unaware of their infectious state.

#### ***Vaccination***

- 3.2 All clinical dental personnel should be vaccinated against the hepatitis B virus (HBV) (if not immune or infected with HBV) as this is the most effective method of personal protection against acquiring HBV infection in the dental setting. Vaccination against HBV does not, however, lessen the need for strict adherence to effective infection control practices, as there are other transmissible viral infections for which there is no vaccine.

#### ***Personal Hygiene***

- 3.3 Fingernails should be short and clean. Rings, watches and arm jewelry should not be worn.
- 3.4 Hands and forearms **must** be washed prior to and following each patient contact. A surgical soap and/or an antiseptic hand wash **must** be used and hands should be dried with a single use disposable paper towel. Hand washing reduces the susceptibility to infection from resident and/or transient micro-organisms capable of transmitting disease.
- 3.5 Any cuts or open skin lesions **must** be covered with a waterproof dressing. Any clinician with exudative lesions or weeping dermatitis on the lower arms, hands or face should refrain from direct patient contact until the condition is resolved.
- 3.6 Clinical personnel may wear a specific uniform. A clean and freshly laundered uniform should be worn each day or period of duty and replaced promptly if soiled. The uniform can be domestically laundered.
- 3.7 Food and drink **must** not be consumed in the clinical and sterilising areas.

#### ***Personal Protective Equipment***

##### ***Gloves***

- 3.8 Latex or vinyl non-sterile, disposable, properly fitting gloves **must** be worn for all patient examinations and procedures unless extraordinary circumstances apply.
- 3.9 Gloves are single-use items and the same gloves **must** not be used on more than one patient. They must be replaced as soon as possible if damaged. If soiled, gloved hands can be washed clean during treatment of the same patient. However, repeated washing may damage the integrity of the glove barrier, and changing of gloves is recommended in this situation.

##### ***Masks/Chin-Length Shields***

- 3.10 Facemasks **must** be routinely worn during any dental procedure that could result in the creation of an aerosol containing saliva and/or blood. This includes all procedures in which involves:
- Surgical procedures including the use of high-speed and low speed handpieces and ultrasonic scalers;
  - manipulation with sharp cutting instruments during periodontal and prophylaxis treatments;
  - spraying air and/or water into the patient's mouth;

- 3.11 Masks/shields **must** be changed when they become wet or visibly contaminated with blood and/or saliva. In situations where a heavy aerosol is generated, masks/shields may need to be changed during the course of the treatment. Changing the mask/shield between patients is recommended as it prevents a potential route of cross-infection if the gloved hand accidentally touches a contaminated face mask/shield.

#### ***Protective eyewear***

- 3.12 Protective eyewear **must** be worn by all clinical personnel and patients during treatment. This provides protection from damage due to macroscopic particles, chemical injury, or microbial infection. Eyewear **must** be impact-resistant and should have solid side shields for peripheral protection. Protective eyewear should not distort vision and should be able to be decontaminated with a cleaning agent/disinfectant between patients.

#### ***Outer Protective Clothing***

- 3.13 For clinical practice, regardless of what is personally worn (street clothes/corporate uniform), outer protective clothing should be worn when undertaking procedures that involve the likelihood of body fluid contamination. The outer occupational garment should be fluid resistant but need not be fluid proof. The garment should be made of material that does not permit blood or other potentially infectious materials to pass through or reach the dental health care worker, their clothes or epithelium; ideally a disposable, semi-pervious, non-woven gown.
- 3.14 Protective garments:
- **must** be changed when visibly soiled; and
  - should be changed at least daily [ie laundered or disposed of].
- 3.15 Gloves, chin-length shields and contaminated protective eyewear and/or masks **must** be removed before leaving the clinical area.

## **4 Work Methods**

### ***Primary clinical area***

- 4.1 A "primary clinical working area" around the patient **must** be developed. This area includes the work surfaces of both the dentist and the dental assistant, but excludes for example, patient files and notes, computer screens and x-ray viewers, which should be beyond the primary clinical working area.
- 4.2 Any instruments, equipment and furniture beyond the primary clinical working area should not be handled during treatment as this may spread any potential contaminant outside of the primary clinical area. Touching surfaces, stored instruments and materials by contaminated gloved hands should also be avoided. The use of over-gloves or transfer forceps to handle additional instruments from a drawer or cupboard minimizes the risk of contamination.
- 4.3 The surgery should have a system of instrument delivery such as a tray system. Each patient treatment should be carefully planned so that all instruments and materials necessary for that treatment are available within the primary clinical area, to further reduce the potential for surface contamination.
- 4.4 Measures of asepsis and cross-infection controls that are appropriate for an operating theatre environment are unnecessary and impractical in the typical dental practice. However, where invasive surgical procedures are undertaken in a dental practice, the sterility of instruments should be further maintained by:

- use of packaged sterile gloves; and
  - use of disposable sterile surgical drapes on chair tray tops; and
  - maintaining a no-touch technique.
- 4.5 As there is the potential for contamination via aerosols, critical items outside the primary clinical area should be covered or removed from bench tops. Drawers and cupboards should not remain open during treatment.
- 4.6 Effective sterilisation or disinfection of potentially contaminated equipment and surfaces **must** be carried out between all patient treatments (see section 6 and 8).
- 4.7 Disposable materials and equipment should be used where appropriate. All single use items **must** be properly discarded after use into appropriate containers (see section 11)
- 4.8 When administering local anaesthetic a previously unused and sterile disposable needle and a previously unused cartridge of local anaesthetic **must** be used for each patient.
- 4.9 **Injury from needles and cuts from sharp items have the greatest potential for cross-infection.** The act of recapping needles increases the risk of needle-stick injury. When recapping a dental syringe, a one-handed technique **must** be used - either a scoop technique, or preferably the use of a protective recapping device. Needle recapping **must** never involve two hands because of the potential for injury. Workflow practices should be developed to avoid cross-reaching by assistants which increases the potential for needle-stick injury.

**The appropriate procedure following needle-stick injury is outlined in Appendix A**

## **5 Sterilisation vs Disinfection**

- 5.1 For the purposes of this COP "sterilisation" is defined as:

***The complete destruction of all micro-organisms on an inanimate object or instrument.***

- 5.2 "Disinfection" is defined as:

***The destruction of micro-organisms in the non-sporing or vegetative state using either heat or chemical means.***

- 5.3 Disinfection of instruments has been replaced by sterilisation. In dentistry, chemical disinfectants have limited use. Immersion in a cold chemical disinfectant solution instead of the use of an autoclave is not appropriate for several reasons:

- Sterilisation by chemical solutions cannot be biologically monitored.
- Instruments sterilised by chemical solutions must be handled aseptically, rinsed in sterile water and dried with sterile towels – procedures that are generally not practical.
- The effect of chemical 'sterilisation' is variable, from sterility at one extreme to minimal reduction in microbial contamination at the other.
- Contact time to achieve sterility is 6-10 hours.

- 5.4 Sterilisation is the desired process for all reusable instruments and equipment that can withstand the process regardless of the intended use. Disinfection of reusable instruments **must not** be carried out as a substitute for sterilisation.

- 5.5 All instruments used in invasive procedures (eg endodontic files, forceps and elevators) **must** be sterile at the point of use. Prior to their use or reuse such items of equipment **must** be cleaned, wrapped, sterilised and stored in a manner which maintains its sterility.

- 5.6 All other instruments and equipment **must** be sterilised between uses unless they are incapable of withstanding a sterilisation process. Items incapable of being effectively sterilised for reuse must be single use and disposable.
- 5.7 Multiple use equipment incapable of being sterilised (eg electric motors, X-ray heads and composite curing lights) may require the use of an instrument sheath or sleeve, or protective barrier to create a barrier for use of that item during procedures. Such items **must** be disinfected between uses.

## 6 Environmental Surfaces

- 6.1 Any surface likely to have become contaminated during dental treatment **must** be thoroughly cleaned and then disinfected immediately following each patient treatment. These surfaces include, but are not limited to:
- the patient chair;
  - operator's tray;
  - spittoon;
  - overhead light handle;
  - x-ray head; and
  - any items/surfaces which may have been contaminated by touching with gloved hands, for example composite syringes, capsules, spatulas, mixing slabs, curing light surfaces and drawer handles.
- 6.2 Disposable contact wrap or commercially available 'fitted' covers, where applicable, can be used on frequently contaminated surfaces. The wrap or cover **must** be changed between patients. Where sterility of instruments is to be maintained, the tray top **must** be covered with a sterile drape.

**Selection of cleaning agents and their preparation is detailed in Appendix B and the technique for disinfecting environmental surfaces is detailed in Appendix C.**

## 7 Instrument re-processing

### ***The re-processing area***

- 7.1 All used items for re-processing **must** be cleaned and sterilised in a designated area separate from the clinical areas. There **must** be a written policy on the methods, and frequency, of cleaning of the area and also of the equipment. To facilitate this function, equipment in the area should ideally include the following:
- Separate handwashing facilities
  - Adequate bench space
  - Smooth surfaces without crevices
  - Good lighting
  - Efficient ventilation
  - Adequate storage space for materials and equipment

- Bins or other containers for the storage of waste
- Non-slip flooring
- Cleaning sinks
- Drying facilities
- Directed traffic flow from reception of contaminated instruments to final distribution of clean products.

### **Decontamination**

7.2 For the purposes of this COP "decontamination" is defined as:

***The cleaning of visible contamination or bioburden.***

7.3 Decontamination **must** occur prior to sterilisation. All instruments or equipment to be re-processed **must** be decontaminated manually and with either an instrument washer or an ultrasonic cleaner.

**The required method of decontamination is detailed in Appendix D**

## **8 Instrument pre-packaging**

8.1 The purpose of packaging and wrapping of items for sterilisation is to provide an effective barrier against sources of potential contamination in order to maintain sterility during storage and to permit aseptic removal of the contents of the pack.

8.2 Instruments that are to be stored prior to use **must** be sterilised in correctly sealed packaging that is intended for this purpose. Pins, staples or paper clips should not be used as these can make holes in the wrap that permit entry of microorganisms. Sterile packaged instruments should be correctly stored in a designated area that does not compromise sterility.

8.3 All instruments used in invasive procedures **must** be sterile at the point of use and **must** be wrapped prior to sterilization

8.4 Packaging and wrapping materials **must** permit the removal of air from the pack, penetration of the steam into the pack and removal of any residual water vapour. Sharp instruments should be packaged in a way that the tips of these instruments are exposed to the sterilising agent but will not perforate the packaging material. Drapes should be laundered prior to reuse and any single use wrapping **must** be only used once and then discarded.

8.5 Rigid reusable sterilisation containers may be used as a system of sterile instrument delivery. The container used for packaging instrument sets **must** be perforated to ensure penetration of the sterilizing agent and efficient drying. If required to be stored as sterile at the point of use such containers must be wrapped prior to sterilisation.

8.6 Consideration should be given to the size of packs as large packs may inhibit effective sterilisation and drying. If a pack or its contents are wet immediately on completion of the sterilisation cycle, the pack **must** be deemed non-sterile and **must** not be used.

8.7 Some earlier models of autoclaves were not designed to take packaged instruments as they do not have a drying cycle. If instruments from such autoclaves are packaged and sealed **after** autoclaving to prevent them from being contaminated, they cannot be considered to be sterile at the point of use.

8.8 Packs should be labeled prior to sterilisation. Labeling should include batch control data such as time and date of sterilisation and identification of the contents if the contents are not visible

through the pack. For practices in which there is more than one autoclave, a system of labeling packs and identifying the item to a particular sterilisation cycle is desirable.

## 9 Sterilisation of Instruments

- 9.1 Sterilisation is the mandatory process for all reusable instruments and equipment that can withstand the process regardless of the intended use. Disinfection of reusable instruments **must not** be carried out as a substitute for sterilisation.
- 9.2 All instruments used in invasive procedures **must** be sterile at the point of use. Prior to any re-use these items of equipment **must** be:
- (a) Cleaned and decontaminated (see part 7 of this COP); and
  - (b) Wrapped and sterilised; and
  - (c) Stored in a manner that maintains sterility.
- 9.3 All instruments and equipment **must** be sterilised between uses, except for:
- (a) Instruments incapable of being effectively sterilised for reuse, which therefore **must** be single use and disposable.
  - (b) Equipment incapable of being effectively sterilised (for example electric motors and composite curing lights) which should be covered, for example by an instrument sheath, or sleeve, or protective barrier. Such items **must** also be disinfected between uses.
- 9.4 All hand pieces **must** be sterilised prior to re-use following a cleaning and lubrication regimen specified by the manufacturer. Commercially available cleaning and lubrication machines are recommended for this purpose. Handpieces which are to be stored prior to use **must** be appropriately wrapped prior to sterilisation.

### **Autoclaves**

- 9.5 The type of autoclave used **must** be appropriate for the types of items requiring re-processing. The manufacturer's written instructions for the loading and operation of the autoclave **must** be followed. An incorrectly stacked or overloaded autoclave may prevent total access to the instruments by the steam. An operator's manual for the autoclave **must** be available on-site at all times.
- 9.6 Autoclave cycles without a drying stage are suitable only for unwrapped items and **must not** be used to sterilise pre-wrapped instruments that are to be stored prior to use.
- 9.7 On completion of the autoclave cycle the load **must** be immediately removed from the autoclave and visually inspected to ensure that the load is dry, any packaging is intact and the sterilisation indicators have undergone the required colour change (see part 10). When an autoclave has been used to sterilise unwrapped instruments (see part 8), appropriate handling procedures (ie cheattle forceps) **must** be developed and documented by the dentist for implementation.
- 9.8 Some autoclaves allow loads to be processed and left in a closed chamber overnight. Care should be exercised when using this option to process critical items as residual water vapour may compromise the sterility of the wrapped items.

- 9.9 The dentist **must** ensure that the autoclave and the area in which it is installed comply with the manufacturer's specifications. This includes demonstrating that the autoclave operates within predetermined limits when used in accordance with its operational specifications (see part 10).
- 9.10 To ensure the effectiveness of the sterilising cycle on installation, the autoclave should be calibrated by the supplier. An autoclave **must** be recalibrated and the sterilisation process revalidated following service or any other technical changes to the autoclave.
- 9.11 For existing autoclaves where no permanent record of the physical parameters of each cycle is obtained either by print-out or direct observation, a chemical or biological indicator **must** be included in each load.
- 9.12 Chemical indicators do not indicate sterilisation, only that the load has been exposed to the physical condition the indicator is monitoring. Various types of chemical indicators are available, each with different response characteristics in that they differ in the sterilising conditions they will detect and verify. Written documentation **must** be available on-site relating to interpretation of indicator results and factors affecting the reliability of the indicator. An indicator that has not changed indicates a sterilisation process failure and that the load cannot be considered sterile.
- 9.13 Biological indicators challenge the microbial killing power of the sterilisation process and usually include biological spores. Each time a biological indicator is used one additional control indicator from the same batch used for testing **must** be left unexposed to the sterilisation process, incubated and treated to verify the pre-sterilisation viability of the test spores and the ability of the incubation culture medium and temperature to promote rapid growth. Written information regarding the use, storage, handling and interpretation of the biological indicator **must** be available on-site.

**Any failure of a biological test indicates a need for revalidation of the sterilizing process and/or servicing of the autoclave.**

## 10 Validation

- 10.1 The sterilisation program **must** be validated to ensure the reliability of the process. A validation protocol **must** be developed. This protocol is to be explicit in what, when and how to measure process parameters. A major component of the validation process is in interpreting the results. True objective validation is only possible if the requirements upon which the sterilisation process will be evaluated have been defined prior to validation.
- 10.2 Validation of the sterilisation process is not just related to the autoclave but also to other factors such as decontamination, the load and its arrangement, and storage of instruments. Validation **must** be repeated annually or when significant changes are made to any aspect of the reprocessing activities, for example changes to packaging materials, loading configurations and sterilisation process parameters.
- 10.3 The performance of the autoclave **must** be validated. Such validation **must** demonstrate attainment of the required sterilising parameters throughout the specified steriliser load. Monitoring of these physical parameters may include data loggers, chemical or biological indicators (see 9.11-9.13). Monthly biological testing of the autoclave is recommended.
- 10.4 As exposed chemical and biological indicators change over time, clear and adequate written records **must** be kept of the results of routine validation of the autoclave.

**A comprehensive validation protocol applicable to the dental surgery environment is detailed in Appendix F of AS/NZS 4815:2006. The reader is referred to this document for further information.**

## 11 Waste Disposal

- 11.1 Contaminated sharp disposables (needles, scalpels and local anaesthetic cartridges) **must** be handled with extreme care to avoid injuries. They **must** be placed in a rigid impervious container, which can be sealed prior to disposal.

**Sharp containers must meet the requirements specified in AS/NZS 4031:1992 or AS/NZS 4261:1994 as appropriate.**

- 11.2 All contaminated disposables, including waste drugs and other surgical waste, should be placed in a secure container. Disposal is not permitted in general refuse services provided by the local authority. Commercial management for the disposal of all hazardous medical waste is available in most major centers in New Zealand and is recommended.
- 11.3 Liquid wastes should be disposed of by carefully pouring into the sewerage drainage system followed by a free flow of running water (eg flushed down toilet or sluice).
- 11.4 Territorial Local Authority Regulations apply to the final disposal of the various categories of waste. Dentists are strongly encouraged to contact their Local Authority for specific instructions on the disposal of clinical waste.

## 12 Contaminated Items for Dispatch

### *Impressions and appliances*

- 12.1 Impressions and appliances should be rinsed under running water to remove saliva and visible blood / body substances. They **must** then be sealed in a suitable container (such as an autoclave pouch), and labeled as "DISINFECTED" or "NOT DISINFECTED" prior to dispatch to the laboratory.
- 12.2 Completed appliances **must** be disinfected before insertion.
- 12.3 The compatibility of impression materials with a disinfectant may vary, therefore the manufacturers' recommendations for proper disinfection must be followed.

### *Instruments for Repair*

- 12.4 All heat-stable instruments, including hand pieces, **must** be cleaned, sealed in a suitable container (eg an autoclave pouch) and sterilised as for normal patient preparation before being sent for repair. For the service person's information, the item should be labeled as 'sterile'.

# Appendices

## **Appendix A: The procedure following needle-stick injury**

Immediate care following injury

If the infectious status of the patient is unknown the injured person must:

- Clean and irrigate the wound thoroughly with running water (10 minutes) and then wash the area with soap and water.
- Encourage bleeding, but do not traumatise the area
- Apply aqueous betadine (povidone-iodine) to the site and cover
- Notify their employer.
- At a convenient time in the next few days the injured person should have blood drawn for a baseline screen for HBV, HCV and HIV.

The dentist/employer should:

- Make an assessment of the likelihood that the patient has HBV, HCV or HIV infection.
- Assess the likelihood that the injury would have transmitted infection were the patient infected.
- Assess the type of injury. A splash injury carries extremely low risk of transmission. A deep penetrating injury with a hollow bore needle containing blood carries a higher risk of viral transmission.
- If the patient is thought likely to have HBV, HCV or HIV infection and the injury is considered likely to transmit infection then advice should be promptly sought from an Infectious Diseases Consultant.
- Explain the nature of the staff injury and the reasons for concern to the patient and request consent from the patient for blood testing. The patient has the right to decline testing.
- Keep a complete record of the event.

If the patient is already known to be HBV, HCV or HIV positive at the time of injury:

Immediately follow steps as above and

- The employer must IMMEDIATELY contact the on-call Infectious Diseases Registrar or Consultant at your local major hospital for a risk assessment and recommendations for action.
- If the patient source is known to be HIV positive, this is extremely important as prophylactic treatment should be started within 2 hours of an injury with a significant risk of transmitting infection.

## **Appendix B: The Selection of Chemical Disinfectant Agents**

### ***Cleaning and Disinfecting Agents***

These agents are solutions used for cleaning all items of equipment and environmental surfaces. They also assist in the removal of bioburden which must always occur prior to any disinfecting process. Cleaning agents must be labeled correctly, displaying manufacturer's name, directions and expiry date. Material safety data sheets (MSDS) should be held for each cleaning product.

Factors that determine the effectiveness of chemical disinfectants:

*Satisfactory contact* - Disinfection is not possible unless the solution has direct and complete contact with all surfaces for the correct length of time.

*Avoiding neutralisation* - Hard water, plastic, rubber, organic waste/bioburden and many detergents reduce the effectiveness of many chemical disinfectants.

*Concentration* - A solution reconstituted below the recommended strength will not be fully effective; higher concentrations are not necessarily more efficacious and are a waste of resources.

*Stability* - Dilutions may deteriorate with age. The expiry date on the container must be checked before use.

*Speed of action* - Some chemical disinfectants destroy micro-organisms more readily than others.

*Range of action* - Not all chemical disinfectants destroy the same range of micro-organisms.

*Cost* - Using a chemical disinfectant inappropriately is expensive and inefficient.

### **Cleaning agents**

Cleaning agents for manual cleaning should be:

- biodegradable
- non-corrosive
- non-toxic
- non-abrasive
- low foaming
- free rinsing
- preferably liquid
- mildly alkaline (pH range 8.0-10.8) to assist in protein breakdown

In addition, cleaning agents should not contain any of the following agents:

- perfumes
- chlorine
- fatty soaps
- glycerine
- lanolin
- optical brighteners

### **Making up Cleaning Solutions**

Cleaning solutions can be either purchased as bulk concentrated solution or as a ready to use solution in the dispenser. Bulk concentrated solution may be financially practical; however, the following points need to be considered:

- 1 An accurate protocol for the correct dilution/strength of the working solution needs to be developed and correct measuring devices used.
- 2 Labeling of dispenser containers must be correct.
- 3 Hygienic handling and correct storage of bulk concentrated solution containers are necessary to minimise contamination and spoilage of contents.
- 4 Containers used to finally dispense the cleaning agent should themselves be either discarded after use or cleaned/disinfected in an appropriate manner to further prevent contamination and bacterial growth in the solution with potential for cross-infection.

Ready-to-use solution is advantageous because:

- 1 Errors in dilution strength are avoided;
- 2 Appropriate labelling of product is self-evident.

### **Commonly Used Disinfectants in the Dental Setting:**

#### ***Hypochlorites*** (eg Milton, Domestos, Presept)

Hypochlorites destroy a wide range of micro-organisms and are effective against the Hepatitis B and HIV viruses. Their activity is reduced in the presence of organic matter, and they are corrosive at concentrations necessary for environmental disinfection.

For use on environmental surfaces – 1000ppm free chlorine or 0.1%

To make up a 1000ppm solution that is stable for 1-30 days, dilute a 5.25% NaOCl solution by one part bleach to 15 parts water. This solution must then be stored in a closed brown bottle. Solution to be dispensed into squeegee bottles on a daily basis and any unused solution discarded at the end of the day.

For use directly on blood and body fluids – 10,000ppm or 1%

Caution: Care must be taken to obtain the correct dilutions.  
Not recommended for: Upholstery (bleach/fade), benchtop units, chrome and other metal surfaces.  
Recommended for: floors, ceramic basins, body fluid contamination.  
Contact time: 10 minutes.

#### ***Alcohol***

Isopropanol or ethanol in 70% - 90% solution is suitable to rapidly disinfect **physically clean surfaces** and some clinical equipment. It evaporates quickly leaving the surface dry, but penetrates organic material poorly. Alcohol destroys most viruses but not spores.

Caution: These solutions are flammable. The solutions must be stored in a cool, well ventilated area. Care must be taken when spraying solution for alcohol dispersion into the atmosphere. Squeegee bottles are more appropriate than spray bottles. Alcohol damages the shellac mounting of lensed instruments and tends to swell and harden rubber and certain types of plastic tubing after prolonged and repeated use. It can also bleach rubber and plastic files.  
Not recommended for: delicate monitoring or electronic equipment.  
Recommended for: physically clean bench tops, chrome and stainless steel surfaces and ceramic basins.  
Contact time: at least two minutes is necessary to destroy HIV.

#### ***Phenolics and Quaternary Ammonium Compounds***

These two groups are used mainly in detergents. Microbial kill ability at varying strengths remains difficult to verify; however, their ability to inactivate bacteria through destruction of cell walls is proven. The effectiveness of both is influenced adversely by hard water and soap.

Recommended for: floors, bench tops, walls, furniture.

Note: Environmental surfaces, floors and walls should be smooth to facilitate cleaning. Carpet is not allowable in the clinical environment.

Contact time: ten minutes.

## **Appendix C: Technique for disinfecting environmental surfaces**

The items/surfaces that are to be cleaned must have the disinfectant left wet on the surfaces so that the required contact time can be achieved for adequate surface disinfection. At completion of the required contact time the disinfectant is then wiped away.

If a combined detergent/disinfectant is used, the product should be used once to clean away soilage and then reapplied and left wet on the surfaces for the required contact time for disinfection. The detergent/disinfectant is then wiped away.

- Notes:
- 1 Pump spray is preferred to aerosol fine mist spray as the release of aerosols should be controlled as much as possible.
  - 2 Manufacturers' recommendations regarding contact times **must** be followed to ensure effectiveness.
  - 3 Surfaces that are not touched or otherwise contaminated during patient treatments, need not be cleaned and disinfected between each patient but should be cleaned and disinfected at the end of each work day.

### ***Cleaning Cloths***

Cloths should be lint free, used once and discarded. Cloths should be damp but not dripping, to avoid further dilution of the cleaning solution.

### ***Excessive Bioburden***

Any soilage by body fluids or mucous splatter (bioburden) must be first cleaned away using paper towels with gloved hands, and disposed of into the rubbish. The area is then treated as any other contaminated surface.

### ***Delicate Surfaces (eg around light and chair switches)***

The cleaning agent and/or disinfectant should be applied onto a damp cloth and then onto the surface. Avoid applying excess solution as it can seep into joints and cracks making drying more difficult and potentially damaging equipment.

## **Appendix D: Method for decontamination of instruments for reprocessing**

### ***Manual cleaning***

All instruments for reuse must be thoroughly cleaned before any sterilization procedure. Autoclaving of instruments that have not been cleaned bakes the blood and mucus onto them, which may leave viable bacterial and viral contamination underneath and within the baked layer. The steam does not have access to these organisms.

The use of utility gloves over clinical gloves during cleaning is highly desirable to reduce the risk of injury by sharps.

Household detergents are not to be used as they interfere with the sterilization process. Purpose designed detergents are available to facilitate cleaning.

The required method for manual cleaning is as follows:

- (a) Flush the item in warm running water to remove gross visible blood or body substances;
- (b) Fill sink or other container with water and a non-foaming detergent to the manufacturer's recommended concentration;
- (c) Dismantle or open all items for cleaning prior to placement in the cleaning solution;
- (d) Wash all surfaces of the items removing stubborn staining by using a non-abrasive scouring pad or soaking in an approved stain removing solution;
- (e) Rinse item in warm running water.

### **Ultrasonic cleaners**

Ultrasonic cleaners may be used to effectively clean jointed and serrated stainless steel instruments and are the recommended method of mechanical cleaning. Cannulated instruments may be cleaned in an ultrasonic cleaner provided that the manufacturer's instructions are followed.

Plastics, glass and similar non-metallic materials generally should not be cleaned by this method as they may be damaged (for example, mirrors will be damaged by repeated ultrasonic cleaning). The instructions provided by the manufacturer of the instrument should be considered in relation to the suitability of the instrument for ultrasonic cleaning. Handpieces should not be placed in an ultrasonic cleaner.

Cleaning of the ultrasonic cleaner and replacement of the cleaning solution is necessary at least daily or more frequently depending on how many and what type of instruments are being cleaned and the effectiveness of the manual cleaning process to which the instruments are subjected to prior to ultrasonic cleaning.

Procedure:

- (a) All instruments to be cleaned in the ultrasonic cleaner must first be manually cleaned;
- (b) Fill the ultrasonic cleaner with cold water;
- (c) Add the measured amount of recommended detergent;
- (d) Turn the cleaner on to degas the solution;
- (e) Place the manually cleaned instruments into the cleaner basket and submerge the basket into the solution, ensure full submersion of instruments. Heavy items such as extraction forceps do not allow the ultrasonic machine to operate effectively and should be placed into the ultrasonic cleaner separately from lighter instruments;
- (f) Close the lid and operate the machine for a minimum of 10 minutes;
- (g) Rinse the instruments in warm water ready for further processing;
- (h) Prior to sterilization all instruments should be dried.

### **Instrument washers**

Commercially available instrument washers have closed cabinets which are linked to the water supply and drainage system. The machines are loaded with soiled instruments which are then processed through an automated cleaning and drying cycle. Instruments must be positioned to ensure surfaces are exposed to the action of the water spray without dislodgement and to allow drainage. Daily checks for detergent or rinse additive residue are necessary to establish efficacy of the final rinse process.

## **Appendix E: Water Lines and suction units**

Many dental unit water lines incorporate retraction valves to prevent dripping which results in the potential for infectious material to enter the water lines. The water supply to hand pieces, air/water syringes and ultrasonic scalers should be flushed for 30 seconds at the beginning of each day prior to the commencement of any treatment and for 20 seconds after each patient.

Anti retraction valves (one-way flow check valves) may be required by Territorial Local Authority Regulations to be installed to prevent fluid aspiration and reduce the potential for transfer of potentially infective material into the public water supply. Routine inspection and maintenance of these valves is necessary to ensure effectiveness.

Fitting a bottled water supply to the dental unit to supply all water lines allows the use of distilled water, and also provides the ability to flush through and disinfect water lines daily.

## Further reading

- 1 Australian and New Zealand Standard AS/NZS 4815:2006 "Office-based health care facilities - reprocessing of reusable medical and surgical instruments and equipment, and the maintenance of the associated environment"
- 2 Recommended infection control practices in dentistry. Morbidity and Mortality Weekly Report RR-8, May 28, 1993 (<ftp://ftp.cdc.gov/pub/Publications/mmwr/RR/RR4208.pdf>).
- 3 Recommendations for hygiene in dental practice, including treatment for the infectious patient - Federation Dentaire Internationale Technical Report No 10 International Dental Journal 37: 142-145, 1987.
- 4 Greenspan, D et al AIDS and the Dental Team, Copenhagen: Munksgaard 1986.
- 5 Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-prone Invasive Procedures - Morbidity and Mortality Weekly - Report 40; 1-9 1991
- 6 Definitions - Sterilisation and disinfection from Faculty of Dentistry University of Otago - April 1993
- 7 APIC Association for Professionals in Infection Control and Epidemiology Principles and Practice, Mosby © 1996
- 8 Introduction to Sterilisation, Disinfection and Infection Control. Second Edition. Gardner/Peel, Churchill Livingstone © 1991. Pgs 34-35.
- 9 Occupational Safety and Health in Dental Practice. NZDA Guidelines 1996
- 10 Infection Control and Applied Epidemiology Principles and Practice Association for Professionals in Infection Control and Epidemiology INC, 1996
  - i) Chapter 88, Dental Office
  - ii) Section E Cleaning, Disinfection and Sterilisation
- 11 Applied Microbiology for Nurses, Gould and Brooker © 2000. Chapter 5, pgs 103-112
- 12 Infection Control Recommendations for the Dental Office and the Dental Laboratory, American Dental Association (ADA) Council on Scientific Affairs and ADA Council on Dental Practice, Journal American Dental Association, 1992: 123(8) (Supplement).

## COMPLIANCE CHECK LIST

### *General*

- Staff training
- Documented infection control policy
- Policy reviewed, reinforced, updated.
- Practice follows "Universal Precautions"
- Bioburden removed prior to disinfection or sterilisation
- Hepatitis vaccination for staff or signed declination
- Staff aware of cuts and needle-stick potential
- Current medical histories for patients

### *Personal Hygiene*

- Staff fingernails short and clean
- No personal jewellery
- Efficient handwashing before and after treatments
- Cuts and open skin lesions covered

### *Personal Protective Equipment*

- New pair of gloves per patient

### *Work Methods*

- Work methods minimise risk of cross infection
- Designated primary clinical area
- No cross contamination of primary clinical area
- All environmental surfaces, floors and walls smooth and easily cleaned
- Sterilised instruments segregated
- Required instruments available in the primary clinical area
- Staff wear protective glasses and barrier face masks
- Patients wear protective eyewear
- Outer protective clothing worn/laundered/disposable/confined to surgery
- No food or drink in the clinical areas
- Disposable local anaesthetic and needles
- Protocol to be implemented for needle-stick/sharp injury/body fluid splash - **OSH**
- Documentation of all needle-stick/sharps injury/body fluid splash - **OSH**

### *Sterilisation, Cleaning & Disinfection*

- Only sterile instruments penetrate tissues.
- All heat stable instruments sterilised
- All heat sensitive equipment disposable and discarded
- Cleaning and disinfecting agents stored correctly
- Instruments precleaned, autoclave correctly loaded, stacked, suitable water
- Autoclave maintained, calibrated and sterilisation process validated
- Water lines flushed / anti- retraction valves / bottled sterile water
- Correct disposal of sharps, contaminated disposables, liquid wastes
- Impressions and models rinsed, disinfected and contained for transport
- Instruments and handpieces sterilised before dispatch for repair