Maintain Infection Control in Dental Practice

HLTIN301C • HLTIN302B

Learner’s Guide
Copyright and Terms of Use

© Department of Training and Workforce Development 2016 (unless indicated otherwise, for example ‘Excluded Material’).

The copyright material published in this product is subject to the Copyright Act 1968 (Cth), and is owned by the Department of Training and Workforce Development or, where indicated, by a party other than the Department of Training and Workforce Development. The Department of Training and Workforce Development supports and encourages use of its material for all legitimate purposes.

Copyright material available on this website is licensed under a Creative Commons Attribution 4.0 (CC BY 4.0) license unless indicated otherwise (Excluded Material).

Except in relation to Excluded Material this license allows you to:

- Share — copy and redistribute the material in any medium or format
- Adapt — remix, transform, and build upon the material for any purpose, even commercially

provided you attribute the Department of Training and Workforce Development as the source of the copyright material. The Department of Training and Workforce Development requests attribution as: © Department of Training and Workforce Development (year of publication).

**Excluded Material not available under a Creative Commons license:**

1. The Department of Training and Workforce Development logo, other logos and trademark protected material; and
2. Material owned by third parties that has been reproduced with permission. Permission will need to be obtained from third parties to re-use their material.

Excluded Material may not be licensed under a CC BY license and can only be used in accordance with the specific terms of use attached to that material or where permitted by the Copyright Act 1968 (Cth). If you want to use such material in a manner that is not covered by those specific terms of use, you must request permission from the copyright owner of the material.

If you have any questions regarding use of material available in this product, please contact the Department of Training and Workforce Development.

Training Sector Services
Telephone: 08 6212 9789
Email: sectorcapability.ip@dtwd.wa.gov.au
Website: www.dtwd.wa.gov.au
## Contents

### Introduction
Using this learner’s guide ................................................................. 5
HLTIN301C Comply with infection control policies and procedures .......... 7
HLTIN302B Process reusable instruments and equipment in health work ...... 17
Resources .......................................................................................... 28

### Section 1 – Terminology associated with disease ....................... 29

### Section 2 – Microorganisms ......................................................... 35
  Classifications .................................................................................. 35
  Microorganisms and their role in disease .......................................... 39
  Oral infections .................................................................................. 41

### Section 3 – Factors essential for infection ................................. 43
  How disease can be transmitted ...................................................... 43
  The body’s protection ..................................................................... 44

### Section 4 – Handwashing techniques ......................................... 47
  Handwashing .................................................................................. 47

### Section 5 – Clothing and protective attire .................................. 53
  In the clinical environment ............................................................... 53

### Section 6 – Cleaning routines ...................................................... 57
  Dusting surfaces .............................................................................. 57
  Daily cleaning of the surgery and the dental chair ............................ 59
  Weekly cleaning of the dental chair, the surgery and the sterilising room .... 60
  Purging of the dental chair with a bleach solution ............................ 60
Section 7 – Standard and transmission-based precautions ..........63
Standard precautions.............................................................................................................63
Transmission-based precautions (known previously as additional precautions) .63
Surfaces to be protected against contamination.................................................................66
Following patient dismissal.................................................................................................67

Section 8 – Recommended principles of surgery decontamination .....69
Swabbing procedures .........................................................................................................70
Assessment activity 1 ...........................................................................................................73

Section 9 – Decontamination .........................................................................................77
Manual decontamination....................................................................................................78
How to decontaminate successfully....................................................................................79
How to handle and dispose of sharp instruments (sharps) safely .....................................80
General instructions for cleaning handpieces....................................................................82
Mechanical decontamination ..............................................................................................85

Section 10 – Sterilisation .................................................................................................89
Preparing instruments for sterilisation using an autoclave ..............................................90
Instrument tracking ............................................................................................................92
Monitoring and spore-testing autoclaves ..........................................................................97

Section 11 – Disinfection .................................................................................................103

Section 12 – Maintenance of instruments and equipment .......................107
Instruments and equipment .................................................................................................107
Protocols used to report faults and organise the servicing of equipment ............108

Section 13 – Monitoring and maintenance of autoclaves to Australian Standards® .................................................................................................................109

References .......................................................................................................................113

Glossary ............................................................................................................................115
Introduction

Using this learner’s guide

A learner’s guide is just that – a guide that will help you learn. It is **not** a textbook. It will:

- describe the skills you need to demonstrate to achieve competency in HLTIN301C and HLTIN302B
- provide information and knowledge to help you develop your skills
- provide you with structured learning activities to help you to absorb knowledge and information, and practise your skills
- direct you to other sources of additional information about topics associated with these two units
- support your classroom learning.

Additional support

You can try some of the following.

- Look for other resources in your learning institution. You may find books, journals, videos and other materials which provide additional information about topics in these two units of competency.
- Look for other resources in your local library. Most librarians keep information about government departments and other organisations, services and programs. The librarian should be able to help you find such resources.
- Contact your facilitator by telephone, mail, fax or email.
- Contact dental company representatives for information on infection control products.
- Visit websites of dental companies and websites about infection control.
- Go to the website for the Oral Health Centre of Western Australia (OHCWA) and search for *Infection Control Policy and Guidelines*. Your facilitator will help you to log on.
- Go to the website for the Department of Health and Ageing <www.health.gov.au> then search for infection control guidelines.
- Contact the WA branch of the Australian Dental Association (ADA).
- Refer to *Torres and Ehrlich Modern Dental Assisting* by Doni Bird and Debbie Robinson. (See ‘Resources’ at the end of this introduction.)
- Watch the video *Invitation to a virus: Safety precautions for dentists and doctors*. (See ‘Resources’ at the end of this introduction.)
How to get the most out of this guide

1. Read through the information carefully and make sure you understand the material. If you come across anything you do not understand:
   - talk to your facilitator
   - research the area using the books and materials listed under ‘Resources’ at the end of this introduction
   - discuss the issue with others (your workplace supervisor, fellow workers, fellow students)
   - relate the information presented in this guide to your own experience and to what you already know.

Ask yourself questions as you go along. For example, ask ‘Have I seen this happening anywhere?’, ‘Could this apply to me?’, ‘What if … ?’. This will help you to make sense of new material and to build on your existing knowledge.

2. Talk to others about your study. Talking is a great way to reinforce what you are learning.

3. Make notes.

4. Work through the activities.

   You may be tempted to skip some activities, but it’s a good idea to do them anyway. They are there for a reason. Even if you already have the knowledge or skills relating to a particular activity, completing the activities will help to reinforce what you already know. If you do not understand an activity, think carefully about the question or instructions. Read the section again to see if you can make sense of it. If you are still confused, talk to your facilitator or discuss the activity with other students, fellow workers or your workplace supervisor.

Additional research, reading and note taking

If you are using the additional references and resources suggested in this guide to take your knowledge a step further, there are some simple things to keep in mind to make your research easier.

1. Always make a note of the author’s name, the title of the book or article, the edition and the page number.

2. Keep your notes short and to the point.

3. Put information into your own words. This will give you a better understanding of the material.

4. Relate your notes to the material in this guide.

5. Start off with a question you want to answer when you are exploring additional resource materials. This will structure your reading and save you time.

To successfully complete this guide, you will need to supplement your learning by obtaining more information from the dental industry. This includes dentists, specialists and representatives from dental companies who demonstrate products and techniques.
HLTIN301C  Comply with infection control policies and procedures

Descriptor  This unit acknowledges the importance of complying with an effective infection control strategy that ensures the safety of the client (or end-user of health-related products/services), maintains personal protection and prevents the transmission of infections from person to person.

All tasks must be carried out in accordance with state or territory legislative requirements that affect work practices of the organisation and/or worker. This unit of competency describes the skills and knowledge required for workers to comply with infection control policies and procedures. All procedures must be carried out in accordance with current infection control guidelines, Australian/New Zealand Standards™ for maintaining infection control, and the policies and procedures of the organisation.

Employability skills  This unit contains employability skills.

Application  This unit is applicable to workers who are responsible for following workplace procedures to maintain infection control.

Application of this unit should be contextualised to reflect any specific workplace infection risks, hazards and associated infection control practices.

Elements  These define the essential outcomes of a unit of competency.

Performance criteria  These specify the level of performance required to demonstrate achievement of the element. Terms in italics are elaborated upon in the range statement.
## Elements and performance criteria

<table>
<thead>
<tr>
<th>Element 1 – Follow infection control guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Demonstrate the application of <em>standard precautions</em> to prevent the spread of infection in accordance with organisation’s requirements.</td>
</tr>
<tr>
<td>1.2 Demonstrate the application of <em>additional precautions</em> when standard precautions alone may not be sufficient to prevent transmission of infection.</td>
</tr>
<tr>
<td>1.3 <em>Minimise contamination</em> of materials, equipment and instruments by aerosols and splatter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element 2 – Identify and respond to infection risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Identify <em>infection risks</em> and implement an appropriate response within own role and responsibility.</td>
</tr>
<tr>
<td>2.2 Document and report activities and tasks that put clients and/or other workers at risk.</td>
</tr>
<tr>
<td>2.3 Respond appropriately to situations that pose an infection risk in accordance with the policies and procedures of the organisation.</td>
</tr>
<tr>
<td>2.4 Follow <em>procedures for risk control</em> and risk containment for specific risks.</td>
</tr>
<tr>
<td>2.5 Follow <em>protocols for care following exposure to blood or other body fluids</em> as required.</td>
</tr>
<tr>
<td>2.6 Place appropriate signs when and where appropriate.</td>
</tr>
<tr>
<td>2.7 Remove spills in accordance with the policies and procedures of the organisation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element 3 – Maintain personal hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Maintain hand hygiene by washing hands before and after client contact and/or after any activity likely to cause contamination.</td>
</tr>
<tr>
<td>3.2 Follow <em>handwashing procedures</em>.</td>
</tr>
<tr>
<td>3.3 Implement <em>hand care</em> procedures.</td>
</tr>
<tr>
<td>3.4 Cover cuts and abrasions with waterproof dressings and change as necessary.</td>
</tr>
</tbody>
</table>
| Element 4 – Use personal protective equipment | 4.1 Wear personal *protective clothing and equipment* that complies with Australian/New Zealand Standards™, and is appropriate for the intended use.  
4.2 Change protective clothing and gowns/aprons daily, more frequently if soiled, and, where appropriate, after each client contact. |
| --- | --- |
| Element 5 – Limit contamination | 5.1 Demarcate and maintain clean and contaminated zones in all aspects of health care work.  
5.2 Confine records, materials and medicaments to a well-designated *clean zone*.  
5.3 Confine contaminated instruments and equipment to a well-designated *contaminated zone*. |
| Element 6 – Handle, package, label, store, transport and dispose of clinical and other waste | 6.1 Wear appropriate personal protective clothing and equipment in accordance with occupational health and safety policies and procedures when handling *waste*.  
6.2 Separate waste at the point where it has been generated and dispose of into waste containers that are colour-coded and identified.  
6.3 Store clinical or related waste in an area that is accessible only to authorised persons.  
6.4 Handle, package, label, store, transport and dispose of waste appropriately to minimise potential for contact with the waste and to reduce the risk to the environment from accidental release.  
6.5 *Dispose of waste* safely in accordance with policies and procedures of the organisation and legislative requirements. |
<table>
<thead>
<tr>
<th>Element 7 – Clean environmental surfaces</th>
<th>7.1 Wear personal protective clothing and equipment during <em>cleaning procedures</em>.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.2 Remove all dust, dirt and physical debris from work surfaces.</td>
</tr>
<tr>
<td></td>
<td>7.3 Clean all work surfaces with a neutral detergent and warm water solution before and after each session or when visibly soiled.</td>
</tr>
<tr>
<td></td>
<td>7.4 Decontaminate equipment requiring special processing in accordance with quality management systems to ensure full compliance with cleaning, disinfection and sterilisation protocols.</td>
</tr>
<tr>
<td></td>
<td>7.5 Dry all work surfaces before and after use.</td>
</tr>
<tr>
<td></td>
<td>7.6 Replace surface covers where applicable.</td>
</tr>
<tr>
<td></td>
<td>7.7 Maintain and store cleaning equipment.</td>
</tr>
</tbody>
</table>
Range statement

This relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

**Standard precautions** include:

- aseptic technique
- personal hygiene practices especially washing and drying hands, eg before and after client contact
- use of personal protective equipment
- techniques to limit contamination
- surface cleaning and management of blood and body fluid spills
- safe handling of sharps
- safe disposal of sharps and other clinical waste
- appropriate reprocessing and storage of reusable instruments.

**Additional precautions** may include:

- special ventilation requirements
- additional use of personal protective equipment
- dedicated equipment, eg to each client or as appropriate to work function
- use of a special facility.

**Minimising contamination** may include but is not limited to:

- protecting materials, equipment and instruments from contamination until required for use
- ensuring that instruments used for invasive procedures are sterile at time of use
- cleaning all environmental surfaces.

**Infection risks** may include but are not limited to:

- sharps injury
- waste
- discarded sharps
- human waste and human tissues
- related waste
- general waste
- inhalation of aerosols
- contact with blood and other body substances
- personal contact with infectious materials, substances and/or clients
- stock, including food which has passed ‘use-by’ dates
- animals, insects and vermin.
Procedures for risk control may include but are not limited to:

- eliminating a hazardous process
- using personal protective equipment appropriately
- changing a system of work to reduce a hazard
- isolating the hazard
- using protective devices to decrease exposure
- using safe handling techniques
- following infection control policies and procedures
- procedures to minimise the risk of exposure to blood and body fluids.

Protocols for care following exposure to blood or other body fluids may include but are not limited to:

- immediate care following:
  - a sharps injury
  - a splash of blood or other body fluids
- post-exposure care
- record-keeping and notification
- legal requirements for the notification of all work-related occurrences of injury, disease or illness.

Handwashing procedures may include:

- routine handwash
- surgical handwash
- use of antiseptic wipes and alcohol-based preparations in specific situations where waterless hand hygiene is acceptable.

Hand care may include but is not limited to:

- suitable water-based hand creams that are registered on the Australian Register of Therapeutic Goods
- using warm water for handwashing
- drying hands thoroughly after handwashing
- wearing heavy-duty utility gloves when handling irritant chemicals.

Protective clothing and equipment may include but are not limited to:

- gowns and waterproof aprons that comply with Australian/New Zealand Standards™
- examination gloves and surgical gloves that comply with current Australian/New Zealand Standards™
- glasses, goggles or faceshields
- surgical face masks that comply with current Australian/New Zealand Standards™
- footwear to protect from dropped sharps and other contaminated items
- guidelines for clients and staff allergic to latex.
Clean zone includes but is not limited to:

- storage areas for materials, medicaments, equipment
- sterile storage areas
- administration areas.

Contaminated zone includes but is not limited to:

- area used for items that have become contaminated during use
- receiving area for contaminated instruments in the instrument reprocessing centre.

Waste may include but is not limited to:

- clinical waste:
  - discarded sharps
  - human tissues
  - laboratory waste
  - any other waste as specified by the workplace
- related waste:
  - radiographic waste
  - chemical and amalgam waste
  - cytotoxic waste
  - pharmaceutical waste
  - radioactive waste
- general waste.

Disposal of waste requirements may include:

- disposal in accordance with:
  - Environmental Protection (Waste Management) Policy
  - Environmental Protection (Waste Management) Regulations
  - Australian/New Zealand Standards™
  - organisation’s policies and procedures.

Cleaning procedures include but are not limited to:

- damp dusting benches, equipment and shelving
- maintaining the interior of drawers and cupboards in a clean and tidy state
- cleaning floors daily using a mop and water and detergent
- storing cleaning equipment clean and dry
- managing the removal of a small blood or body fluid spill.
Required skills and knowledge

To demonstrate competence in this unit, you must acquire the following essential knowledge and skills.

Essential knowledge

You must be able to:

• demonstrate the essential knowledge required to effectively do the task outlined in the elements and performance criteria of this unit
• manage the task
• manage contingencies in the context of the identified work role.

This includes knowledge of:

• additional precautions
• aspects of infectious diseases, including:
  - opportunistic organisms
  - pathogens
• basic microbiology, including:
  - bacteria and bacterial spores
  - fungi
  - viruses
• clean and sterile techniques
• disease transmission:
  - paths of transmission, including direct contact, aerosols and penetrating injuries
  - risk of acquisition
  - sources of infecting microorganisms, including persons who are carriers in the incubation phase of the disease or those who are acutely ill
• effective hand hygiene:
  - procedures for routine handwash
  - procedures for surgical handwash
  - when hands must be washed
• good personal hygiene practice including hand care
• identification and management of infectious risks in the workplace
• organisation requirements relating to immunisation, where applicable
• personal protective equipment:
  - guidelines for glove use
  - guidelines for wearing gowns and waterproof aprons
  - guidelines for wearing masks as required
  - guidelines for wearing protective glasses
• standard precautions
• susceptible hosts, including persons who are immune suppressed, have chronic diseases such as diabetes, and the very young or very old
• surface cleaning:
  – cleaning procedures at the start and end of the day
  – managing a blood or body fluid spill
  – routine surface cleaning
• sharps handling and disposal techniques
• the organisation’s infection control policies and procedures.

**Essential skills**

It is critical that you demonstrate the ability to consistently apply:
• handwashing, personal hygiene and personal protection protocols
• clean and sterile techniques
• protocols to limit contamination.

In addition, you must be able to effectively:
• do the task outlined in the elements and performance criteria of this unit
• manage the task
• manage contingencies in the context of the identified work role.

This includes the ability to:
• apply standard precautions, including consistently:
  – ensuring instruments used for invasive procedures are sterile at time of use (where appropriate)
  – following the procedure for washing and drying hands
  – limiting contamination
  – maintaining clean surfaces, and managing blood and body fluid spills
  – protecting materials, equipment and instruments from contamination until required for use
  – putting into practice clean and sterile techniques
  – using personal protective equipment.

It also includes the ability to:
• apply additional precautions when standard precautions are not sufficient
• take into account opportunities to address waste minimisation, environmental responsibility and sustainable practice issues.
Evidence guide

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

Critical aspects for assessment and evidence required to demonstrate competence in this unit
- Observation of workplace performance is preferred for assessment of this unit.
- The individual being assessed must provide evidence of specified essential knowledge as well as skills.
- The assessee must demonstrate compliance with the organisation’s infection control policy as it relates to specific job role.
- Consistency of performance should be demonstrated over the required range of workplace situations.

Context of and specific resources for assessment
- Assessment should replicate workplace conditions as far as possible.
- Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible.

Method of assessment
- evidence of essential knowledge and understanding may be provided by:
  - traditional or online (computer-based) assessment
  - written assignments/projects
- case study and scenario as a basis for discussion of issues and strategies to contribute to best practice
- questioning
- staff and/or client feedback
- supporting statement of supervisor
- authenticated evidence of relevant work experience and/or formal/informal learning
- role-play/simulation.

Access and equity considerations
All workers in the health industry should be aware of access and equity issues in relation to their own area of work.

All workers should develop their ability to work in a culturally diverse environment.

In recognition of particular health issues facing Aboriginal and Torres Strait Islander communities, workers should be aware of cultural, historical and current issues impacting on the health of Aboriginal and Torres Strait Islander people.

Assessors and facilitators must take into account relevant access and equity issues, in particular relating to factors impacting on the health of Aboriginal and/or Torres Strait Islander clients and communities.
HLTIN302B  Process reusable instruments and equipment in health work

Descriptor  This unit of competency describes the skills and knowledge required for workers in the health care setting to clean and sterilise reusable instruments and equipment and to maintain associated environments. All procedures must be carried out in accordance with current infection control guidelines, Australian/New Zealand Standards™ and the policies and procedures of the health care establishment.

All tasks must be carried out in accordance with state or territory legislative requirements that affect work practices of the health care establishment and/or health care worker.

Employability skills  This unit contains employability skills.

Prerequisite unit  This unit must be assessed after successful achievement of HLTIN301C Comply with infection control policies and procedures.

Application  This unit is applicable to health care workers who are responsible for processing reusable instruments and equipment and maintaining associated environments in a health care facility.

Application of this unit should be contextualised to reflect any specific workplace infection risks, hazards and associated infection control practices relating to specific workplace instruments and equipment in line with individual workplace policies and procedures.

Elements  These define the essential outcomes of a unit of competency.

Performance criteria  These specify the level of performance required to demonstrate achievement of the element. Terms in italics are elaborated upon in the range statement.
## Elements and performance criteria

<table>
<thead>
<tr>
<th>Element 1 – Prepare to clean used items</th>
<th>1.1 Follow <em>safe work practices</em> and standard precautions at all times in accordance with <em>legislative and workplace guidelines</em>.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.2 Dispose of sharps and sharps debris into a container that meets Australian/New Zealand Standards™ at the point of use.</td>
</tr>
<tr>
<td></td>
<td>1.3 Segregate and <em>dispose of waste</em> according to organisation and legislative requirements.</td>
</tr>
<tr>
<td>Element 2 – Clean and dry used items</td>
<td>2.1 Maintain <em>workflow protocols</em> in instrument reprocessing area.</td>
</tr>
<tr>
<td></td>
<td>2.2 Prepare instruments for <em>cleaning</em>.</td>
</tr>
<tr>
<td></td>
<td>2.3 Select and safely use <em>appropriate cleaning agents</em>.</td>
</tr>
<tr>
<td></td>
<td>2.4 Use <em>cleaning methods</em> that avoid the generation of aerosols.</td>
</tr>
<tr>
<td></td>
<td>2.5 Dry and inspect instruments for damage and remaining debris.</td>
</tr>
<tr>
<td></td>
<td>2.6 Monitor the <em>cleaning process</em>.</td>
</tr>
<tr>
<td>Element 3 – Prepare and pack items for sterilisation</td>
<td>3.1 Open and unlock instruments with hinges or ratchets.</td>
</tr>
<tr>
<td></td>
<td>3.2 Prepare instrument trays in accordance with workplace protocols.</td>
</tr>
<tr>
<td></td>
<td>3.3 Package or wrap <em>critical site instruments</em> in a manner that prevents damage to delicate items.</td>
</tr>
<tr>
<td></td>
<td>3.4 Place the appropriate chemical indicator into packages as required in accordance with current Australian/New Zealand Standards™ and workplace protocols.</td>
</tr>
<tr>
<td></td>
<td>3.5 Label packs with the contents of the pack and <em>batch control data</em> as required in accordance with current Australian/New Zealand Standards™ and workplace protocols.</td>
</tr>
<tr>
<td></td>
<td>3.6 Seal wrapped trays with steriliser indicator tape as required in accordance with current Australian/New Zealand Standards™ and workplace protocols.</td>
</tr>
</tbody>
</table>
### Element 4 – Sterilise loads

<table>
<thead>
<tr>
<th></th>
<th>4.1 Operate the steriliser safely and in accordance with manufacturer’s instructions, legislative guidelines and workplace protocols.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.2 Monitor each sterilising cycle and record the details as specified in current Australian/New Zealand Standards™.</td>
</tr>
<tr>
<td></td>
<td>4.3 Maintain records for each sterilising cycle as required in accordance with current Australian/New Zealand Standards™ and workplace protocols.</td>
</tr>
<tr>
<td></td>
<td>4.4 Unload the steriliser on the completion of the drying cycle to ensure sterility of items.</td>
</tr>
<tr>
<td></td>
<td>4.5 Follow criteria for release of processed items as specified in current Australian/New Zealand Standards™.</td>
</tr>
<tr>
<td></td>
<td>4.6 Store sterile packs to maintain sterility in accordance with workplace protocols.</td>
</tr>
</tbody>
</table>

### Element 5 – Maintain sterilising equipment

<table>
<thead>
<tr>
<th></th>
<th>5.1 Clean and check sterilisers routinely as required in accordance with current Australian/New Zealand Standards™ and workplace protocols.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.2 Follow the preventive maintenance program as established by the workplace in conjunction with manufacturer or maintenance contractor.</td>
</tr>
<tr>
<td></td>
<td>5.3 Monitor the sterilising cycles at the intervals specified in current Australian/New Zealand Standards™.</td>
</tr>
</tbody>
</table>
Range statement

This relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Safe work practices may include but are not limited to:

- treatment of all used items as a potential source of infection
- personal hygiene practices especially washing and drying hands
- work practices for the safe handling of sharps
- work practices for the safe disposal of sharps and other clinical waste
- the use of personal protective equipment:
  - heavy-duty gloves
  - mask and protective eyewear
  - hair protection or covering
  - protective clothing and safety footwear
- safe handling, storage and disposal of chemicals
- safe handling techniques especially as they relate to lifting and handling dangerous and contaminated items.

Legislative and workplace guidelines may be included in:

- the current and endorsed version of the Australian/New Zealand Standards™
- infection control guidelines for the transmission of infectious diseases in the health care setting
- state or territory legislative requirements
- the material safety data sheets for the chemicals used
- organisation infection control policies and procedures
- occupational health and safety policies and procedures.

Waste may include but is not limited to:

- clinical waste:
  - discarded sharps
  - human tissues
  - laboratory waste
  - any other waste as specified by the workplace
- related waste:
  - radiographic waste
  - chemical and amalgam waste
  - cytotoxic waste
  - pharmaceutical waste
  - radioactive waste
- general waste.
Disposal of waste requirements may include:
- disposal in accordance with:
  - Environment Protection (Waste Management) Policy
  - Environment Protection (Waste Management) Regulations
  - Australian/New Zealand Standards™
  - organisation’s policy.

Workflow protocols may include:
- separate handwashing facilities
- sink suitable for disposal of liquid waste
- cleaning sink
- one-direction flow of instruments from contaminated to clean to sterile
- designated work area that is physically separate to prevent possible contamination of processed items
- identification and reporting of disruptions to workflow protocols in accordance with workplace procedures.

Preparation of instruments for cleaning may include:
- sorting according to type of instrument and corresponding cleaning method
- written procedures for handling specialised items
- disassembly of instruments where possible for detergent to reach all surfaces
- checking for instrument defects, damage and missing parts.

Selection and use of appropriate cleaning agents may include:
- meeting requirements of product data bulletins and material safety data sheets for the chemicals used.

Cleaning methods may include:
- initial treatment of used instruments close to their point of use to decrease bioburden
- thermal washer-disinfector in accordance with current Australian/New Zealand Standards™
- ultrasonic cleaner in accordance with current Australian/New Zealand Standards™
- manual cleaning.
Monitoring the *cleaning process* may include:

- visual inspection of all items for cleanliness and absence of detergent or rinse additive residues
- daily cleaning and maintenance of ultrasonic cleaner and washer-disinfector according to Australian/New Zealand Standards™
- daily performance testing of ultrasonic cleaner according to Australian/New Zealand Standards™
- daily checks of washer-disinfector function and detergent dispenser.

**Critical site instruments** may include:

- instruments used to enter or penetrate into the tissue, cavity, organs or bloodstream of a client
- instruments which must be sterile at time of use.

**Batch control data** may include:

- steriliser identification number or code
- date of sterilisation
- cycle or load number.

**Sterilisers** may include:

- portable (benchtop)
- downward displacement
- pre-vacuum
- dry heat.

**Operation of the steriliser** may include:

- a load configuration that:
  - ensures items do not touch the chamber walls
  - contains items within the load-carrying basket or tray
  - permits total steam penetration to all surfaces
  - ensures wrapped items are dry on completion of the drying cycle
  - reduces damage to packs and their contents
  - ensures safe handling on the completion of cycle
- selection and activation of the appropriate sterilisation cycle
- selecting the appropriate drying time for the composition of the load
- ensuring the cycle is complete and sterilisation parameters have been met before removing items
- observing safety precautions when unloading and transporting items
- reporting and following workplace protocols when sterilisation errors occur.
Monitoring of sterilisers may include but is not limited to:

- daily (for pre-vacuum sterilisers):
  - external chemical indicator leak rate test
  - Bowie-Dick
- every packaged item:
  - external chemical indicator
- every cycle:
  - electronic printout of sterilisation parameters
  - chemical indicator (Class 4, 5 or 6).

Maintaining sterilising cycle records may include:

- daily (for pre-vacuum sterilisers):
  - external chemical indicator leak rate test
  - Bowie-Dick
- every packaged item:
  - external chemical indicator
- every cycle:
  - electronic printout of sterilisation parameters
  - chemical indicator (Class 4, 5 or 6).

Criteria for release of processed packaged items may include:

- achievement of cycle parameters as set during performance validation
- external chemical indicators having correct colour change
- packaged items being intact and having no visible moisture
- correct result of other tests:
  - biological indicators
  - enzymatic indicators
  - process challenge devices
  - electronic data loggers.

Routine cleaning and checking of sterilisers may include but is not limited to:

- daily checks:
  - floor of steriliser free of debris
  - chamber drain and filter clear
  - recording devices, gauges and timers functioning correctly
  - water reservoir (portable benchtop sterilisers) emptied, cleaned and refilled with distilled water
  - door seals intact
- cleaning:
  - loading tray and external surfaces cleaned daily
  - steriliser chamber cleaned weekly when cold.
Required skills and knowledge

This describes the essential skills and knowledge and their level required for this unit.

Essential knowledge

You must be able to:

• demonstrate essential knowledge required to effectively do the task outlined in the elements and performance criteria of this unit
• manage the task
• manage contingencies in the context of the identified work role.

This includes knowledge of:

• instrument maintenance checklists
• requirements for the monitoring of sterilisation cycles
• safe work practices, standard precautions and organisation protocols for the reprocessing and storage of reusable instruments
• safe work practices and standard precautions when handling and disposing of sharps including:
  - destination of different types of sharps after use
  - reprocessing of sharp instruments
  - safe handling of local anaesthetic cartridge and needle
  - transfer of sharps between operator and assistant
• the level of reprocessing required for non-critical site instruments, semi-critical site instruments and critical site instruments
• workflow protocols in the instrument reprocessing area
• workplace procedures for manual cleaning
• workplace procedures for steriliser use
• workplace procedures for using an ultrasonic cleaner and/or thermal disinfector.

Essential skills

It is critical that you demonstrate the ability to consistently:

• use safe handling, drying and cleaning protocols
• use correct packing, assembly and wrapping procedures for sterilisation and storage
• prepare items for sterilisation
• use safe operation of sterilisation equipment
• interpret data and complete sterilisation records
• use appropriate OHS procedures and comply with current Australian/New Zealand Standards™.
In addition, you must be able to effectively do the task outlined in the elements and performance criteria of this unit, manage the task and manage contingencies in the context of the identified work role.

This includes the ability to consistently:

- follow safe work practices and apply standard precautions during cleaning and preparation of items for sterilisation:
  - check items for defects after cleaning
  - select and safely use appropriate cleaning agents
  - select and wear appropriate personal protective equipment
- dry items before packaging
- maintain workflow protocols in instrument reprocessing area from contaminated to clean to sterile
- operate mechanical cleaners including ultrasonic cleaner and thermal washer-disinfector
- operate the steriliser in a safe and effective manner
- protect sterile items from all vapours, aerosols and splashing generated during procedures, handwashing, instrument washing, ultrasonic cleaning and reprocessing
- store packaged items in a clean place away from sources of moisture and contamination
- store unwrapped sterilised items in dedicated clean, dry containers that are protected from aerosol contamination
- take into account opportunities to address waste minimisation, environmental responsibility and sustainable practice issues.
### Evidence guide

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

#### Critical aspects for assessment and evidence required to demonstrate competence in this unit

- Evidence of specified essential knowledge as well as skills.
- Observation of workplace performance is preferred for assessment of this unit.
- Consistency of performance should be demonstrated over the required range of workplace situations.

#### Context of and specific resources for assessment

- Assessment should replicate workplace conditions as far as possible.
- Simulations must not be used to represent workplace conditions.

#### Method of assessment

- Observation in the workplace
- Evidence of essential knowledge and understanding may be provided by:
  - traditional or online (computer-based) assessment
  - written assignments/projects
- Case study and scenario as a basis for discussion of issues and strategies to contribute to best practice
- Questioning
- Staff and/or client feedback
- Supporting statement of supervisor
- Authenticated evidence of relevant work experience and/or formal/informal learning
- Role-play simulation.

#### Access and equity considerations

All workers in the health industry should be aware of access and equity issues in relation to their own area of work.

All workers should develop their ability to work in a culturally diverse environment.

In recognition of particular health issues facing Aboriginal and Torres Strait Islander communities, workers should be aware of cultural, historical and current issues impacting on the health of Aboriginal and Torres Strait Islander people.

Assessors and trainers must take into account relevant access and equity issues, in particular relating to factors impacting on the health of Aboriginal and/or Torres Strait Islander clients and communities.
Aim
To enable you to assist at the chair-side and apply your knowledge of relevant microbiology, sources of infection, methods of disease transmission and immunity against disease.

Synopsis
Relationship of microorganisms to the practice of dentistry; sources of infection; methods of transmission; types of immunity.

Assessment
Assessment will be wholly internal, and may include:
• a case study
• practical exercise or simulation
• oral questions
• workplace assessment.

Grading
CO Competent/Pass
H Hold
R Re-enrol

Recognition of prior learning
If you are able to substantiate or demonstrate that you already possess the knowledge and skills to demonstrate competency in these units, you may be granted credit.

About these units
These units will enable you to achieve the level of skill you need to implement the principles of infection control necessary for your own protection and that of your patients.

While you are working through these units, you will review and revise, where necessary, the infection control measures practised in your workplace. You will develop an awareness of the need to introduce a high standard of cleanliness, maintain a strict regime and understand the implications/consequences of not doing so.

It is hoped that you will value the knowledge and skills you learn and become an example to fellow workers in achieving and maintaining a high standard of infection control. In this way you can be proud of your safe work environment and feel secure in the knowledge that you have protected yourself, staff and patients against infection.
Resources

Essential


Department of Health and Ageing <www.health.gov.au>

NSW Health Department’s *Infection Control Guidelines for Oral Health Settings* <www.health.nsw.gov.au>

School of Dentistry <www.dentistry.uwa.edu.au>

Optional

Dental companies

Videos

Australian Dental Association (WA) Infection Control Committee 1992, *High level infection control in dental practices*. (intended as a guide for dental assistants)

Shames, D 1988, *Invitation to a virus: Safety precautions for dentists and doctors*, Pyramid Film and Video, Santa Monica, California.

Organisations

HIV Dental Education Association Incorporated

WA branch of the ADA
Section 1 – Terminology associated with disease

aetiology  the systematic study of the causes of anything, especially of diseases*
deficiency  the state or fact of being deficient; lack; incompleteness; insufficiency*

The following diseases can result from inadequate intake or absorption of essential dietary elements such as vitamins or minerals.

Vitamin deficiencies
Vitamin A  xerophthalmia
Vitamin B₁  beri-beri
Vitamin C  scurvy
Vitamin D  rickets
Vitamin 132  pellagra

Mineral deficiencies
iron  anaemia
iodine  goitre
Lack of protein  kwashiorkor
Lack of food  marasmus

disease  a morbid condition of the body, or of some organ or part; illness, sickness, ailment*
endemic  peculiar to a particular people or locality*; present more or less continuously in a community, eg sleeping sickness in South Africa; dental caries in developed nations
epidemic  a temporary prevalence of a disease*; disease that spreads rapidly and attacks a large number of people in a community at the same time, eg influenza
pandemic  a disease prevalent throughout an entire country or continent, or the whole world*
pathology  the branch of medical science dealing with the origin, nature and course of diseases*
prognosis  a forecasting of the probable course and termination of a disease*
Disease characteristics

**acute** brief and severe*, having rapid onset, eg gingivitis due to physical irritants such as hard food; appendicitis

**benign** not malignant*; not cancerous

**chronic** having a disease over a long period of time, eg marginal gingivitis associated with an abscess

**communicable** either infectious or contagious*

**congenital** existing at or from one’s birth*; disease which is present at birth due to either heredity or prenatal infection, eg heart disease, herpes

**contagious** communicable to other individuals by physical contact*, eg chickenpox

**hereditary** capable of being passed on from parent to offspring via genetic factors, eg amelogenesis imperfecta

**infectious** communicable by infection*; disease resulting from a pathogenic organism, eg measles; such diseases can be spread by any means, whereas contagious diseases are spread only through physical contact

**localised** affecting a particular area or part of the body

**malignant** of or relating to a tumour that destroys the tissue in which it originates and has the potential to spread to other regions of the body by dissemination through the bloodstream and lymphatic system, thus being life-threatening*; cancerous

**psychosomatic** denoting a physical disorder which is caused by or notably influenced by the emotional state of the patient*, eg stomach pain, headache

**systemic** affecting the entire body

*Reproduced with permission from Macquarie Dictionary online 2012, Macquarie Dictionary Publishers Pty Ltd.
Activity 1

As you work your way through this guide, you will be able to define the following.

Anaerobe

Antibody

Bacteria

Commensal

Decontamination

Disinfection
Fungi

Immunisation

Lag time

Microbiology

Opportunistic infection

Pathogen
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spore</td>
<td></td>
</tr>
<tr>
<td>Sterilisation</td>
<td></td>
</tr>
<tr>
<td>Toxin</td>
<td></td>
</tr>
<tr>
<td>Virulence</td>
<td></td>
</tr>
<tr>
<td>Virus</td>
<td></td>
</tr>
</tbody>
</table>
Section 2 – Microorganisms

Classifications

Microorganisms can be classified into four main groups:

- bacteria
- viruses
- fungi
- protozoa.

The first three are important in the area of dental health.

Bacteria

Bacteria are one-celled microorganisms. They can be subdivided according to their shape, for example:

- spherical
- rod-shaped
- spiral-shaped.

Spherical bacteria

These are referred to as cocci. Single cocci are known as monococci. Pairs of cocci are diplococci and clusters of cocci are staphylococci. Chain-forming cocci known as streptococci can cause pneumonia, meningitis, rheumatic fever and ‘strep’ throat.

*Streptococcus mutans* is implicated in dental caries.

Rod-shaped bacteria

These are referred to as bacilli (in the plural) and bacillus (in the singular).

The length and breadth of these bacteria vary and some have hair-like appendages called flagella attached to their outer wall. Bacilli can cause tuberculosis, salmonella, dysentery, typhoid and diphtheria. They are very resistant to disinfectants.

Spiral-shaped bacteria

These are referred to as spirochaetes. They look like corkscrews but they can vary considerably in shape. Some are so tightly wound that it is difficult to see the individual spirals. Spirochaetes can cause acute necrotising ulcerative periodontitis (ANUG), syphilis (venereal disease) and yaws (a skin infection that affects people living in rural, warm, tropical areas).
Aerobes and anaerobes, spores and capsules

Aerobes and anaerobes

Bacteria that need oxygen to be able to grow are known as aerobes. Bacteria that do not need oxygen to grow (and are destroyed by oxygen) are known as anaerobes.

Spores

Some bacteria – usually bacilli – can change into a resistant form known as spores. When this happens, they may survive in extremes of conditions but they cannot reproduce. When conditions are favourable for them, they can multiply and cause disease. Spores are very difficult to kill and as a result are of great concern to the dental industry.

Capsules

Some bacteria form a capsule that creates a slimy covering over the cell wall, eg Streptococcus mutans. These bacteria are generally more virulent. They can easily resist antibiotics and the body’s defences.
Diplococci
Staphylococci
Streptococci

Bacilli (in chains)

Vibrios
Spirilla
Spirochaetes

Fig 2.1 Bacteria

Cocci
Diplococci
Streptococci
Staphylococci

Bacilli
Single bacilli
Anthrax bacilli
Tetanus bacilli (with spores)

Fig 2.2 Cocci and bacilli
Viruses

These are the smallest of microorganisms and can be seen only through an electron microscope (a very powerful electronic magnifying instrument). They possess either deoxyribonucleic acid (DNA) or ribonucleic acid (RNA), but never both.

Viruses replicate themselves within the living host cells only and are characterised by a lack of independent metabolism. Once a virus invades a host cell, it then creates a copy of itself and the host cell is destroyed. Viruses are difficult to destroy because they can mutate; that is, they can change their generic pattern to suit the conditions in which they find themselves so that they become better at resisting efforts to eradicate them.

Some examples of viral diseases are colds, flu, smallpox, measles, chickenpox, mumps, herpes, herpetic gingivostomatitis, hepatitis, AIDS, poliomyelitis, rabies, yellow fever and glandular fever.

Some of these viruses can be contracted during procedures in a dental surgery.

Fungi

Fungi are larger and more variable in appearance and size than either bacteria or viruses. They include yeast, mushrooms and moulds that lack chlorophyll. Fungi can cause a variety of infections like thrush, athlete’s foot and ringworm.

*Candida albicans* – which may cause thrush – is a fungus that is part of the normal flora of the skin, mouth, intestinal tract and vagina.

Angular cheilitis is inflammation of the lips that results in splits or fissures (cracks) in the corners of the mouth. It is related to deficiency diseases, and fungal infections can develop in the moist cracks.

Activity 2

Complete the following table.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Caused by the microorganism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herpes</td>
<td></td>
</tr>
<tr>
<td>Tonsillitis</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td></td>
</tr>
<tr>
<td>Rheumatic fever</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
</tr>
</tbody>
</table>
Microorganisms and their role in disease

Most microorganisms are harmless to humans and incapable of causing disease; that is, they are non-pathogenic. Many microorganisms are necessary for life and of great benefit to humans.

For example, they are useful in the reconstitution of the soil for the growth of plant life, for the disposal of sewage (in septic tanks) and for the production of various foods like cheese and bread, and drinks such as wine and beer. The microorganisms that do not cause disease are known as commensals.

Organisms called pathogens can produce disease because they are able to invade the tissue, and multiply and produce poisonous substances, which cause disease. These poisonous substances are known as toxins.

There are two types of toxins – endotoxins and exotoxins.

Endotoxins

Endotoxins are those which are released into the tissue where some of the invading microorganisms are damaged. They disintegrate and release their poison.

These are responsible for many symptoms such as:

- fever
- raised pulse
- headache
- nausea.

Exotoxins

Exotoxins on the other hand are actively produced by living microorganisms as part of their life cycle and are secreted by them into tissue. Fortunately, there are very few of these organisms, but their exotoxins are usually highly poisonous. One example of this type of microorganism is the bacillus that causes tetanus.

When toxins are present, infection is said to have occurred. The local signs of infection are:

- heat
- pain
- swelling (oedema)
- redness
- pus.

Virulence is the ability of the microorganism to damage the host. The more toxins produced, the more virulent the relative capacity of a pathogen to overcome the body’s defences. Microorganisms are said to be highly virulent if they are capable of causing severe infections; they are said to have low virulence if they produce minor infections.
<table>
<thead>
<tr>
<th></th>
<th>Viruses</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>• Are non-living.</td>
<td>• Are living.</td>
</tr>
<tr>
<td>2.</td>
<td>• Must have a host cell to survive.</td>
<td>• Can survive anywhere as long as conditions are favourable.</td>
</tr>
<tr>
<td></td>
<td>• Are not capable of supporting life because they lack enzymes.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>• Cannot be seen under a microscope.</td>
<td>• Can be seen under a microscope.</td>
</tr>
<tr>
<td></td>
<td>• Need an electron microscope to be seen.</td>
<td>• Are larger than viruses.</td>
</tr>
<tr>
<td></td>
<td>• Are smaller than bacteria.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>• Can mutate.</td>
<td>• Form spores.</td>
</tr>
<tr>
<td></td>
<td>• Are harder to kill than bacteria.</td>
<td>• Can release toxins or reproduce under favourable conditions.</td>
</tr>
<tr>
<td>5.</td>
<td>• Antibiotics are usually ineffective against them.</td>
<td>• Can be treated with antibiotics.</td>
</tr>
<tr>
<td>6.</td>
<td>• Contain either RNA or DNA but never both in central core.</td>
<td>• Contain DNA and RNA.</td>
</tr>
<tr>
<td></td>
<td>• Have nucleic acid.</td>
<td>• Have no central core but have nucleic acid.</td>
</tr>
<tr>
<td>7.</td>
<td>• Have a protein shell.</td>
<td>• Have no protein shell.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Have a cell membrane.</td>
</tr>
<tr>
<td>8.</td>
<td>• Reproduce within a living cell only by replication of nucleic acid.</td>
<td>• Are asexual.</td>
</tr>
<tr>
<td></td>
<td>• Are dependent on the host.</td>
<td>• Can multiply individually by divisions under favourable conditions.</td>
</tr>
<tr>
<td>9.</td>
<td>• Have spherical or rod-shaped variants.</td>
<td>• Can be spherical, rod-shaped or corkscrew-like (spirochaetal).</td>
</tr>
<tr>
<td>10.</td>
<td>• Cannot be grown on ordinary culture media but only on tissue culture in living cells.</td>
<td>• Can be grown on ordinary culture media.</td>
</tr>
</tbody>
</table>
Activity 3
List two oral infections caused by the following.

1. bacteria
   ___________________________________________________________________

2. viruses
   ___________________________________________________________________

3. fungi
   ___________________________________________________________________

Oral infections

Oral infections caused by bacteria
Bacteria are implicated in the disease process of dental caries. These are Streptococcus mutans and Lactobacillus. ANUG is caused by Borrelia vincentii (spirochaete) and Bacillus fusiformis (anaerobic bacteria).

Oral infections caused by viruses
Herpes simplex 1 – commonly called cold sores – results in a condition called herpetic gingivostomatitis (oral blisters and ulcers).

Oral infections caused by fungus
Candida albicans causes thrush, an infection characterised by white plaques covering large areas of the oral mucosa. It is a fungal infection.

Angular cheilitis (sores in the corners of the mouth) is a fungal infection resulting from poor dentures or vitamin B deficiency.
Section 3 – Factors essential for infection

The following factors need to be present for infection to occur:

- a pathogenic organism
- a portal of entry into the host (a way into the body)
- favourable conditions for the establishment and multiplication of the pathogen
- an exit route from the host
- an effective means of transport to another host.

How disease can be transmitted

Infectious agents can be passed (transmitted) from one human being to another in the following ways:

- through direct physical contact – shaking hands, kissing, sexual activity
- through indirect contact – sharing eating utensils, towels; contaminated food and water
- through droplet spray – sneezing, coughing, speaking and other forceful expiratory activities which expel a spray of droplets derived almost exclusively from the saliva of the anterior mouth, and which may be infected with pathogenic microbes from the nose, throat or lungs
- through self-infection – when commensal organisms move from their normal environment to other parts of the body where they become pathogenic. For example, the meningococcal organism travels from the nose via the bloodstream to the brain, causing meningitis.
The body’s protection

The body is protected from infection by various natural defences that include:

- **the skin** – which forms an effective barrier as long as it is intact. Not only is it a physical barrier, it also contains sebaceous glands which produce an antiseptic that can kill many microorganisms.

- **mucous membranes** – where the microorganism population is high, the mucous membrane becomes moist with secretions that trap the microorganisms until they can be removed. Many areas in the body also contain tiny hairs which help to trap these microorganisms. Over 90% are trapped in this way, eg nasal hairs and mucous secretions. Any microorganisms or foreign particles which cross these barriers may be caught within the respiratory passage. There are fine hair-like projections called cilia in the trachea and bronchi. They push any particles up towards the mouth.

- **secretions** – all organs in the body produce secretions that work by either mechanical or chemical means:
  - mechanical secretions – tears, saliva, bile and urine can remove organisms by a flushing action. When the flow of these fluids stops, infection can occur.
  - chemical secretions – the acid secretions of the stomach destroy most bacteria. The vagina – an acid environment – reduces the growth of bacteria. Tears and saliva contain a protein called lysozyme, which is an antibacterial agent.

- **active immunity** – where the body makes its own immunity by:
  - an attack of disease – natural immunity
  - giving vaccine of killed or weakened organisms. This produces antibodies and is artificial, eg giving an antigen such as hepatitis B to the patient.

  Active immunity has a window period before immunity develops. Immunity may last a lifetime, but usually lasts 5–10 years.

- **passive immunity** – where the body is given ready-made immunity:
  - through the placenta from the mother. The baby is given immediate but not lasting immunity to most illnesses (natural immunity).
  - from an injection of serum or ready-made antibiotics (artificial immunity).

  Antibodies produced in response to an infection are specific, eg diphtheria causes the production of antibodies which will neutralise only diphtheria antigens. These antibodies would be useless against a ‘strep’ infection.

Activity 4

List three diseases you can be immunised against to protect you in the dental industry.

- __________________________________________
- __________________________________________
- __________________________________________
Prions (pronounced ‘pree-ons’)

Prions are infectious agents that consist of protein only – unlike all other infectious agents which are composed of nucleic acid (DNA or RNA).

Prion diseases (also called transmissible spongiform encephalopathies) affect the brain. They are neurodegenerative diseases. In a post-mortem examination, the brain would be found to be riddled with holes as in a sponge.

Prion diseases affect both animals and humans.

Animals

Examples of animals affected by prion diseases are the:
- sheep – scrapie
- mink – transmissible mink encephalopathy (TME)
- elk – chronic wasting disease (CWD)
- cow – bovine spongiform encephalopathy (BSE).

BSE is also known as mad cow disease. It was identified in England in 1986. The infected cows became uncoordinated and unusually apprehensive. The source of infection was traced to food supplements that included meat/bone from dead sheep.

Humans

Examples of prion diseases in humans are:
- fatal familial insomnia (FFI)
- kuru (acquired through ritual cannibalism in Papua New Guinea)
- Creutzfeld–Jakob disease (CJD).

CJD first appears as dementia and can be transmitted by corneal transplants, implants of dura mater or electrodes into the brain, contaminated instruments or injection of growth hormones.
Section 4 – Handwashing techniques

Handwashing

Although it is impossible to completely sterilise the skin, handwashing prevents you and others from spreading infection and disease. Microorganisms, especially transient ones acquired from patients, can be removed by thorough handwashing. However, microorganisms in deeper skin layers, cuts or other skin breaks cannot be removed by routine handwashing procedures.

Types of handwashes

There are three types of handwashes and they are referred to as:

- **social handwash** – the basic handwash using a plain soap, water and a vigorous rubbing action. This is usually done following a social contact with patients, going to the toilet or after covering a cough or a sneeze.

- **clinical handwash** – used before clinical procedures on patients. An antimicrobial soap, usually containing an antiseptic agent, is used. All rings, watches and jewellery are removed for this procedure. Staff are trained to perform this.

- **surgical handwash** – required before any invasive or surgical procedure requiring the use of sterile gloves. An antimicrobial skin cleanser usually containing chlorhexidine or detergent-based povidone-iodine is used and can take two to six minutes to perform. Staff are trained to perform this technique.

Condition of the hands

Hands should be:

- free from abrasions – slight cuts must be covered with a semipermeable film dressing. (Adhesive bandages are not recommended in clinical areas, as once wet, they stay moist and can become an ideal environment for microorganisms.) Gloves should be worn at all times during chair-side assisting.

- free from jewellery – no wedding rings or watches, as wrists (5 cm) are washed when handwashing is performed correctly

- dried thoroughly because wetness encourages:
  - bacterial growth
  - dermatitis

- creamed regularly to prevent chafing

- kept with nails clean, short and well manicured. Nail polish must not be worn. Artificial nails have been implicated in a number of outbreaks of infections and must not be worn by any health care worker who has direct patient contact.
Washing should be performed:
• first thing in the morning (long scrub for at least two minutes)
• in between patients
• when changing gloves
• before food breaks (long scrub for at least two minutes)
• last thing before you leave work (long scrub for at least two minutes).

Steps in effective handwashing
1. wetting
2. soaping
3. lathering
4. friction
5. rinsing
6. drying

More time should be spent on the first handwash of the day.

Handwashing technique
1. Stand in a comfortable position at the sink. (Your uniform should not touch the sink.)
2. Turn water on carefully to avoid splashing. Water should be warm. If it is too hot, it will remove oil from the skin which protects you from microorganisms. If it is too cold, it will prevent sudsing.
3. Wet hands, without touching the inside of the sink.
4. Apply handwash solution, lather using a circular motion, wash the palm and back of each hand, under nails and between the fingers. Wash for 10–13 seconds. Keep your hands above waist level.
5. Rinse well.
6. Dry each hand separately and well from fingertips to the wrists on two lengths of paper towel.

Nailbrushes need be used only once daily, preferably first thing in the morning. Take care not to damage the surface of your skin with the bristles.
Section 4 – Handwashing techniques

Fig 4.1 Proper handwashing technique ensuring hands are held higher than the elbows

Note: Wash hands and wrists for at least 15 seconds.
Types of taps in order of preference

1. taps controlled by electronic eye
2. foot-controlled taps
3. elbow taps (where elbows are always used)
4. hand taps

After washing, leave the water running. Wipe your hands, turn off the hot tap first with a paper towel, then turn the cold tap off. Throw the paper towel away.

Always turn the cold tap on first, then the hot. Turn the hot tap off first, then the cold.

Soap

Soap is available in:

- liquid dispensers which cause the least contamination (wash the dispenser lever at least once a day)
- If cakes of soap are used then keep them as dry as possible and in the soap holder.

Soap and other detergents help the cleaning process because of their properties of wetting and penetration. To avoid roughened, chapped or cracked skin, make sure all traces of soap or detergent are removed and your hands are dried thoroughly.

There are various handwash solutions available.

Methods of drying in order of preference

1. Disposable towels are best for preventing cross-infection.
2. Roller towels are hygienic, provided the correct laundering procedures are used.
3. Hot air is suitable but may not dry hands completely as it takes time.
4. Handtowels are least desirable as they must be changed frequently.
Activity 5

Before you start washing your hands, make sure that:
• your nails are short and free of all nail polish
• you are not wearing jewellery or a watch
• all cuts and abrasions are protected.

You are now ready to follow the steps for effective handwashing.
Put the steps below into the correct sequence.

• lathering ______________________________
• rinsing ______________________________
• wetting ______________________________
• friction ______________________________
• drying ______________________________
• soaping ______________________________

For further reading, refer to the chapter on infection control in dentistry in Torres and Ehrlich Modern Dental Assisting.

Alcohol-based hand rubs

Alcohol-based hand rubs (ABHRs) are to be used only when there is no visible soiling on the hands. If hands are visibly soiled then handwashing is required, as the friction of the wash is needed to remove microorganisms. ABHRs are fast acting, air-dry quickly, usually contain an emollient and are less harsh on hands.

Technique
• Apply the ABHR. (Make sure your hands are not wet.)
• Spread the rub using a circular motion. Include the palm and back of each hand, under the nails and between the fingers, as if you were lathering with soap.
• Rub for 20–30 seconds. Do not rinse.

ABHRs may be used up to five times before you need to wash your hands with soap and water, because continuous use builds up a coating on the skin.

• Do not touch:
  – your face
  – your hair
  – your mask.

• Do not:
  – move out of the work zone with gloves on

• Remember to:
  – wash your hands!
Activity 6

1. During your daily duties in the dental surgery, list the occasions when you would wash your hands, eg after you put on your mask.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

2. After you have completed your list, can you think of any other occasions where you think you should now be washing your hands? (An example might be moving from a dirty area to a clean area.)

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Section 5 – Clothing and protective attire

In the clinical environment

Gloves
Gloves should:
• fit well
• have good tactile qualities
• be cost-effective
• be removed when you leave the clinical area
• be changed after every patient
• not be washed, as this leads to deterioration of their protective properties and can result in small perforations developing and the gloves becoming sticky.

Wear gloves:
• during all patient contact
• when decontaminating
• when cleaning.

Advantages of wearing gloves
• reduces risk of staff contracting infections through skin breaks
• reduces the risk of cross-infection from patient to patient

Disadvantages
• cost
• patients may dislike the taste
• initially takes practice to gain dexterity
• may cause skin irritation
• natural latex inhibits the setting of vinyl polysiloxane putty impression material

Various gloves are available and may be:
• sterile, non-sterile
• powder, powder-free
• latex, vinyl
• nitrile – latex free.
Hair

Hair should always be short or tied back effectively – especially around the face. Facial hair increases the risk of cross-infection due to the greater surface area, eg beards, moustaches.

Footwear

Footwear should always have:
- closed-in toes and heels
- comfortable low heels
- non-slip soles.

Cardigans

These should not be worn in clinical areas.

Protective glasses

These should be:
- comfortable, preferably with side shields
- worn when you are exposed to aerosols of blood or saliva or where there is a danger of debris entering your eyes, eg removal of old restorations, adjustments of dental prostheses, scaling or decontamination of instruments.

Protective aprons

These should be:
- worn over uniforms
- worn only in the clinical areas
- washed daily.

Face masks

Dental surgery masks should:
- be of good quality
- fit well and be properly secured, firmly covering your nose and your mouth
- be changed when moist from talking, coughing or exhaling
- be worn by all members of the clinical team exposed to aerosols of blood or saliva
- not be stored in pockets or around the neck.
Types of masks
- disposable face masks – effective for only 10 minutes (not recommended)
- fluid-resistant, particulate respirator masks – effective for up to two hours

Always wear masks and glasses while you are using:
- high-speed handpieces
- triple syringes
- electronic scalers.

Clinical uniform
All uniforms must be short-sleeved, clean and laundered daily. Protective clothing must be worn for all clinical and laboratory procedures, eg protective gowns/pinafores. These should not be worn outside.

Latex allergy information
1. Take into consideration the increase of latex sensitivity in the general community – both in relation to yourself and your patients.
2. Check the medical histories of all your patients for any indications of latex sensitivity or allergy.
3. You may find that through your work, you have developed an allergy to latex. If this is the case, you must take care to avoid contact with it.
4. You can use latex-free gloves and other latex-free dental supplies from dental suppliers.
5. Let your employer know if you develop an allergy to latex and complete a report which may be used for future reference should you notice any adverse reactions.
Section 6 – Cleaning routines

Dusting surfaces

Dust is a source of contamination and it collects throughout the day, especially on flat surfaces.

You can use damp paper towels to remove it. Make sure you follow the principles of high to low in the dental workplace. High areas are those from the benchtop up. Low areas are those from benchtop height down. Low areas are not to be included in the dusting procedures.

Bear in mind that you are dusting – not cleaning.

Activity 7

List the ‘high’ and ‘low’ areas in your workplace.

<table>
<thead>
<tr>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Once you have established what the high and low areas are in your workplace, you can review the clean and dirty areas in the table below.

<table>
<thead>
<tr>
<th>Clean</th>
<th>Dirty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silamat area</td>
<td>dental chair and associated fixtures</td>
</tr>
<tr>
<td>phone</td>
<td>dental assistant’s mixing area</td>
</tr>
<tr>
<td>drawers</td>
<td>sinks</td>
</tr>
<tr>
<td>benchtops</td>
<td>soap dispenser</td>
</tr>
<tr>
<td>desk</td>
<td>ultrasonic cleaner</td>
</tr>
<tr>
<td>autoclave</td>
<td>impressions</td>
</tr>
<tr>
<td>waiting area</td>
<td>disinfectant container</td>
</tr>
<tr>
<td>appointment book</td>
<td>assistant operator chair</td>
</tr>
<tr>
<td>door handles</td>
<td>area where instruments are prepared for sterilisation</td>
</tr>
<tr>
<td>patient card</td>
<td></td>
</tr>
<tr>
<td>computer screen and keyboard</td>
<td></td>
</tr>
<tr>
<td>reception desk</td>
<td></td>
</tr>
</tbody>
</table>

Remember to use commonsense! Wash your hands before and after you dust, using the correct techniques.
Daily cleaning of the surgery and the dental chair

Before you start the daily cleaning of the surgery and the dental chair, make sure that you remove all disposable rubbish and contaminated instruments, including the spittoon trap. Decontaminate the chair-side area first. Run through the aspirating hoses with a recommended solution. Make sure that the unit is disconnected from the power point and turn the compressor off. If necessary, fill the water tank for the high-speed handpiece with distilled water.

Cleaning equipment

You will need:

- a small bowl (autoclave on completion) and some detergent
- a sponge (autoclave on completion) and a drying towel
- gloves (discard on completion)
- a cream cleanser for stains and sinks only.

Follow the principles of high to low and clean to dirty.

With the clean bowl placed on the seat of the dental chair, clean:

1. the towel dispenser
2. the soap dispenser (excluding the lever)
3. the top of the bench and the nurse’s cart (excluding the bin openings)
4. the light arm of the dental unit and the light, but do not touch the globe
5. the bracket arm, the bracket, the switches, the handpiece holders and the hoses of the bracket
6. the cup dispenser area
7. the headrest, the backrest and the armrest of the dental chair and the armrest of the dental assistant’s chair
8. the arm and hose of the aspirator
9. the seat of the dental chair, the seat of the dental assistant’s chair and the operator’s chair
10. the back of the unit.

Then, with the bowl placed on the floor, clean:

11. the lever of the soap dispenser
12. the openings of bins (on benches)
13. the outer spittoon
14. the footrest on the dental chair
15. the bases of the dental chair, the nurse’s chair and the operator’s chair
16. the foot control and electric cord on the dental chair
17. the inside sinks
18. the inner spittoon.
Once you have finished cleaning, position the light and the bracket neatly. Rest the foot control and the electrical cord on the footrest of the dental chair and protect the chair with paper towel.

**Weekly cleaning of the dental chair, the surgery and the sterilising room**

Weekly cleaning of the dental chair, the surgery and the sterilising room involves doing what you do on a daily basis – only more thoroughly.

**The dental chair**

Wash the unit and the chair thoroughly before you take off the headrest, the armrest and the cover of the footrest. The backrest also comes away from the unit and can be cleaned. Remove debris and waste amalgam, etc from these areas. Scrub stains and remove them with a cream cleanser. (Check with the manufacturer of the equipment for recommended cleaning agents.)

**The surgery and the sterilising room**

Clean all surfaces in the surgery and the sterilising room thoroughly.

Empty and clean cupboards. Discard out-of-date stock or re-sterilise it. Place older stock at the front of the cupboard. Restock any cupboards and drawers in the surgery.

Maintain and check autoclaves weekly.

Carry out any other cleaning that is not done routinely.

Wash the insides and outsides of the bins.

**Purging of the dental chair with a bleach solution**

Purging of the dental chair with air should be carried out on a daily basis.

**Once a week** units are purged using a **bleach solution**.

1. Take water container 1 off and drain its contents. Place empty container 2 onto the unit and purge the unit with air.
2. Remove the empty water container 2. Fill both containers with Ecolab® Contain 5000 (one sachet to 5 litres of water or half a sachet to 2.5 litres of water). Allow it to sit in both containers for 10 minutes (it cleans the bottles).
3. Reattach container 2 and purge the unit with bleach. Leave the lines in for 10 minutes (it kills bacteria, algae, etc in the lines).
4. Remove the bleach container and replace it with clean container 1 which has been filled with clean water.
5. Purge container 1 with clean water. Then remove container 1.
6. Attach the empty container 2, purge it with air and leave the bottle empty.
7. The following morning, fill container 2 with water.
8. Run the unit through so that it is ready to use on the first patient.
Lubrication of O-rings (using silicone, not Vaseline®)

Aspirator – Remove the centrepiece from the handpiece. Detach it from the hose.
Small aspirator – Remove the centrepiece from the handpiece.
Under spittoon – Pull out the filter. Remove the opposite end of the filter to allow for the removal of the filter (empty the contents into the bin).
Oil collector situated under the bracket – Change the gauze once a week.

End-of-day care of the dental chair

Along with the usual end-of-day cleaning of the surgery, the dental chair has some special cleaning requirements that need to be attended to at the end of every day.

The lines need to be purged daily. Follow these steps.

1. Turn the unit off.
2. Remove the water bottle and replace with a dry/empty bottle.
3. Turn the unit back on.
4. Hold all the water lines, ie the triple syringe, the high-speed handpiece and the ultrasonic scaler, over the spittoon bowl at the same time as depressing the handpiece foot control and the ‘push’ button located on the side of the bracket. Run the lines through until all the water has been dispelled.
5. Leave the dry/empty bottle on the unit overnight. Replace it with the water bottle at the beginning of the next session. It is OK to use tap water to fill the water bottles.

Methods of cleaning the surgery

All dental workplaces need to be cleaned:
• at the end of every working day
• when you are checking and restocking during the week.

At the end of the working day, make a list of all the areas you have cleaned.
Activity 8

List the equipment you use when you are cleaning.

• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________
• ___________________________________________________________________

Remember! Before you clean, always turn off and unplug all electrical equipment.

You need to find an opportunity during the working week to clean specific areas of the dental surgery.

These include:

• drawers
• cupboards
• the autoclave
• shelves
• desks.

Always use the principles of high to low and clean to dirty.
Section 7 – Standard and transmission-based precautions

Standard precautions

Standard precautions are recommended for the treatment and care of all patients, regardless of their perceived infectious status.

They apply to the handling of blood, dried blood, saliva, all body secretions and excretions, mucous membranes and non-intact skin, regardless of the perceived risk.

Standard precautions are the minimum requirements for the control of infection in all settings.

They include the following measures:

• handwashing
• use of appropriate personal protective equipment (PPE)
• immunisation of health care workers
• use of aseptic techniques
• management of sharps, blood spills, linen and waste to maintain a safe environment
• routine environmental cleaning.

Transmission-based precautions (known previously as additional precautions)

Transmission-based precautions are designed to interrupt the transmission of infection when standard precautions alone are not sufficient.

These precautions should be used in conjunction with standard precautions where an individual assessment has identified an established risk associated with any infectious disease.

The implementation of safe work practices including handwashing, protective barriers, appropriate sharps management and waste management minimises most risks.

Transmission-based precautions are used where there is an established risk of transmission of infection through contact, air or droplets.

Types of transmission-based precautions

1. Precautions against air-transmitted diseases

These precautions apply to patients known, or suspected, to be infected with pathogens that can be transmitted through the air, eg tuberculosis, measles, chickenpox.
2. **Precautions against droplet-transmitted diseases**

These precautions are designed to reduce the risk of droplet transmission of an infectious agent. Droplet transmission involves contact with large particle droplets of the conjunctiva or the mucous membrane of the mouth and nose of an infected person, e.g., mumps, influenza, rubella.

3. **Precautions against diseases transmitted through contact**

These precautions are designed to reduce the transmission of microorganisms (usually by direct skin contact), e.g., herpes simplex, hepatitis A, and methicillin-resistant *Staphylococcus aureus* (MRSA).

Patients infected with these diseases should have their treatment deferred until they are no longer infectious. Transmission-based precautions must be used where treatment cannot be deferred, e.g., in the case of facial swelling.

These include but are not limited to:

- seeing the patient last in the day
- appropriate barrier protection
- the use of a rubber dam to reduce exposure of potentially infected aerosols to dental staff
- helping staff to be aware of their own status of immunity.

Transmission-based precautions are also recommended for CJD and other prion diseases.

### Applying recommended standard precautions

You must remember that all patients are potentially infectious, so use a barrier (plastic cover) to prevent the contamination of surfaces. Make sure that you sterilise or dispose of all equipment that comes into direct or indirect contact with a patient.

### Activity 9

Revise the use of standard precautions, including protective attire.

1. List six standard precaution measures.
   - ____________________________________________________________
   - ____________________________________________________________
   - ____________________________________________________________
   - ____________________________________________________________
   - ____________________________________________________________
   - ____________________________________________________________
2. Do you wear all the recommended attire?
   □ Yes □ No
   What should you be wearing?
   • ________________________________

3. List the protective attire worn by the patient.
   • ________________________________
   • ________________________________
   • ________________________________
   • ________________________________

4. Do you provide your patient with the recommended protective attire?
   □ Yes □ No
   If not, why not?
   • ________________________________

5. List the protective attire you wear when you are cleaning instruments.
   • ________________________________
   • ________________________________
   • ________________________________
   • ________________________________
   • ________________________________

**Immunisation**

Have you started the hepatitis B immunisation regime? □ Yes □ No
Have you completed the regime? □ Yes □ No
Have you had a blood test to determine your status? □ Yes □ No
Surfaces to be protected against contamination

In order to prepare the surgery for treatment, all surfaces and equipment must be covered with the recommended protective materials. You should drape surfaces with plastic wrap, using clean, ungloved hands.

Activity 10

Colour the diagram to show the surfaces that need to be protected.

Surfaces to consider covering

- bracket tray and controls
- light handles and switch
- cords/tubing of:
  - triple syringe
  - handpieces
  - evacuators
  - ultrasonic scaler
  - holders for handpieces, triple syringe, evacuators
- composite light
- x-ray tube, handles and switch.

Fig 7.1
Following patient dismissal

1. Using gloved hands, remove all instruments and equipment.
2. Observe occupational safety and health principles at all times by:
   • removing the plastic barriers, using the principles of high to low
   • placing the plastic barriers on to a large sheet of plastic, covering the bracket
   • enclosing all the plastic in this large sheet
   • disposing of it as waste.
3. Remember to:
   • aspirate the suction unit with a cup of water
   • flush the high-speed handpiece for 20 seconds
   • flush the triple syringes.

Note: The surfaces under the plastic barriers are clean, so they cannot be touched.

Recommendations for the disposal of infectious waste

• Collect all disposable waste and place it into a clearly labelled, infectious waste hazard bag (yellow), if available.
• Autoclave any non-disposable equipment.
• Place all sharps into an appropriate sharps disposal unit.
• Contact a recommended medical waste collection company.
• Store waste amalgam in a labelled, screw-top jar containing spent radiographic fixer then dispose of it using an approved waste recycling agent.
Section 8 – Recommended principles of surgery decontamination

After you have escorted your patient back to the waiting room, you can clear away and prepare the surgery for the next patient. You must:

- wear gloves
- start by clearing all the disposable items, such as bibs, wipes, cotton wool rolls, paper sheets, aspirator tips (if used)
- collect any instruments and equipment used during the procedure and take them to the decontamination area
- aspirate clean water through the aspirator tips and remove ‘squirt’ water from the triple syringe nozzle before taking off the high-speed handpiece. Operate for 20 seconds to allow for removal of any debris.

Activity 11

List the instruments/pieces of equipment you have removed before you begin swabbing.

- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
- ___________________________________________________________________
Swabbing procedures

Swabbing procedure example

When you are swabbing, you must wear clean gloves and always keep the principles of high to low, clean to dirty in mind.

The following are recommended for swabbing:

- Teri Wipes
- Chux® – cut to size
- WYPALL® Wipers
- a neutral detergent, eg Sonidet.

Swabbing technique

- Wash your hands.
- Put your gloves on.
- Moisten two wipes with the neutral detergent (two dabs on the first wipe and two on the second).
- Use one hand to wipe the surfaces. Keep one hand clean so that you can use this to deal with the surfaces that need decontamination, while you use the other hand for swabbing.

Wipe 1

Swab the following in this order.

1. the dental assistant’s bench
2. safety glasses, bib chain, clinician’s bench
3. needle guard, face mirror
4. handle on the bur drawer
5. light switch and light handle
6. headrest and armrest
7. the armrest of the dental assistant’s stool

Throw the wipe away.
Wipe 2

Swab the following in this order.
1. the bracket
2. the operator’s control panel
3. the handpiece couplings
4. the triple syringe
5. the nurse’s control panel
6. the cup area and buttons
7. the aspirator leads and holders
8. the rim of the spittoon

Throw the wipe away, remove your gloves and wash your hands.

**Note:** If any part of the dental chair is visibly contaminated with fluids, eg blood, saliva, remove these before decontamination.

**Activity 12**

Choose a different colour for each of the two wipes and shade in the appropriate areas.
This should help you to visualise the procedure and understand it.

![Diagram of infection control process](image_url)

Fig 8.2
Assessment activity 1

Answer the following questions.

1. You arrive late for work and you go straight into the surgery and start setting up using the standard precautions.
   What should you do before you set up?
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

2. The medical history of one of your patients reveals that she has suffered from hepatitis B.
   What implications does this have for you?
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
3. Your patient is seated and you start assisting with a composite restoration. How should you prepare the patient and yourself?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

4. During the procedure, you are called to the phone. Once you get back, you start aspirating. What is required of you at this stage?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

5. The patient vomits during the procedure. How would you manage the spill in accordance with practice protocols?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
6. Your assistance at the chair-side involves mixing, shade selection, curing of the composite and passing of burs and discs. The procedure is complete and you escort the patient back to the waiting room. You go back to the surgery and start clearing up right away. As you do so, the clean aspirator tubing falls to the floor. List in order the procedure you would follow.

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

Post your answers to your facilitator by the due date (to be advised).
Section 9 – Decontamination

Decontamination simply means cleaning an instrument or piece of equipment using a neutral detergent and water. This is necessary because debris left on instruments following dental treatment forms a barrier which will prevent successful sterilisation. To remove this debris, you have two options – manual decontamination or mechanical decontamination.

However, before you start the decontamination process, you must protect yourself from dangerous organisms and sharps injury.

Fig 9.1 Manual decontamination  Mechanical decontamination

Fig 9.2 Personal protective equipment
You can do this by making sure you are wearing:

- safety glasses or a visor
- a mask
- heavy-duty rubber gloves
- a plastic apron.

**Manual decontamination**

**Equipment required**

- a small scrubbing brush
- detergent
- a proteolytic agent
- a bur brush
- a bottle brush
- a scourer

![Fig 9.3](image)

**Procedure**

1. Pre-soak instruments (especially if you cannot clean them immediately). This softens debris and makes it easier to remove later.

2. Solutions suitable for this purpose are proteolytic agents such as Sterikleen, Trisol and BioSonic® enzymatic solutions.

3. **Do not soak handpieces.**
How to decontaminate successfully

Follow these steps.

1. Scrub items with warm running water using a small scrubbing brush dipped in neutral detergent.
   Use a bottlebrush for the inside of the aspirator tips.
   Use a bur brush for high-speed burs.
   **Note:** Discard slow-speed, carbon steel burs after use.

   ![Fig 9.4](image)

2. Rinse to remove the detergent, as it forms a film over instruments.

   ![Fig 9.5](image)
3. Dry with paper towel.

How to handle and dispose of sharp instruments (sharps) safely

The potential for transmission of bloodborne infections like hepatitis B, hepatitis C and HIV is greatest when needles and sharp instruments are being handled. You must handle ‘sharps’ with care at all times to minimise the risk of injury during procedures, and during the cleaning of reusable instruments and their disposal.

Try and minimise the use of sharps wherever you can and dispose of them as soon as you have finished with them.

The person responsible for the sharp instrument needs to ensure its safe removal and disposal at the end of the procedure. If this is not possible, then the operator must leave the sharp instrument in a safe, secure position so that it can be removed by the dental assistant without any risk of injury.

Keep the passing of sharps from one person to another to a minimum to avoid undue risk of injury.

Removing and bending needles

You must not:

- remove the needle from a disposable syringe before disposal
- purposely break or otherwise manipulate the needle unless the practitioner is performing a procedure in which the needle needs to be bent
- bend a needle after it has been contaminated with blood or other bodily substances
- re-sheath or dismantle endodontic or surgical irrigation syringes. Dispose of them as complete, uncapped units.

Use needle guards for re-sheathing needles after the local anaesthetic has been administered.

The procedure is as follows.

- Before the injection, place the cap in the needle guard once you have removed it from the needle.
• After administration of the injection, replace the used needle in the cap which should still be in the needle guard.
• Remove the needle and the cap as a single unit from the syringe using artery forceps.
• Place the needle and the cap in the nearest sharps disposal container.

**Sharps disposal containers**

Reproduced with permission of Sarstedt Australia Pty Ltd.

Fig 9.7

Sharp disposal containers are:
• not reusable and must comply with Australian Standard® AS 4031:1992 *Non-reusable containers for the collection of sharp medical items used in health care areas*
• puncture-resistant, waterproof and leakproof
• wide enough at the opening to allow sharps to be dropped in with one hand
• identified by clear labelling with black lettering on a yellow background with the biohazard symbol
• securely sealed with a lid before disposal
• placed in the biohazard bins for collection.

Sharps disposal containers must never be overfilled, and they must be sealed and removed from the clinical area when they are three-quarters full.

Sharp objects must never be forced into a sharps disposal container. Containers should be placed as closely as possible to the point of use in order to limit the distance between sites of use and disposal. They must be placed so they cannot be readily accessed by visitors, particularly children.

Items designated as sharp instruments for disposal include:
• dental syringe needles
• suture needles
• scalpels blades
• endodontic files
• needles and syringes used for irrigation (to be disposed of as a whole unit)
• scaler tips (as they are no longer usable)
• burs
• used orthodontic and ligature wires
• anaesthetic cartridges
• glass items.

General instructions for cleaning handpieces

• Run the high-speed handpiece for 20–30 seconds at the chair-side to flush out saliva from its head.
• Remove any debris from the outside of the handpiece by swabbing it with detergent or alcohol.
• Dry then lubricate it, using a can of pressurised lubricant. Shake the can before you use it.

![Reproduced with permission of Henry Schein Halas.](image)

Fig 9.8

• Hold the can upright and point it away from your face (see Figure 9.9).
• Hold a paper towel over the head of the handpiece to absorb any excess oil.
• Activate for one second.
• If the paper towel is discoloured, repeat the procedure.
• Remove the head from the slow-speed handpiece (if applicable) and lubricate the parts separately.
• Drain the handpieces with the head in an upright position for 10 minutes, before you prepare it for sterilisation.
How to maintain handpieces using the W&H® Assistina 301 plus

This unit is used to clean the spray channels and lubricate the moving parts of dental handpieces and air-driven dental scalers.

Maintenance of slow-speed handpieces – contra-angle and straight

(Ensure that the chuck is closed so that solutions can run through correctly.)

Follow these instructions.

1. Swivel the cover down.
2. Push the contra-angle or straight slow-speed handpiece on to the attachment inside the Assistina with the spray outlets down.
3. Close the cover and the waste disposal drawer before you start the cleaning operation.
4. Press the program button for approximately two seconds. Wait until the maintenance cycle has finished (30 seconds) and only then open the cover.
5. Grasp the handpiece and press the red unlocking button. Remove the handpiece.
6. Wipe over the slow-speed handpiece to remove any excess oil and prepare for sterilisation (bag).

Note: Every time you use the Assistina, check the function display by:

- pressing the program button for two seconds. A green ball will appear in the right-hand window to indicate that there is cleaning solution.
- releasing the program button. A green ball will appear in the left-hand window to indicate that there is service oil. The balls will sink after a few seconds.
**Maintenance of high-speed turbines**

Follow these instructions.

1. Swivel the cover down.
2. Screw adapter 1 and gold adapter 2 together.
3. Push the adapters on to the attachment inside the Assistina.
4. Push the high-speed handpiece on to the adapter with the spray outlets down.
5. Close the cover and the waste disposal drawer.
6. Press the program button for two seconds and check the function display. Wait for the cycle to be completed (30 seconds) and only then open the door.
7. Grasp the handpiece and press the red unlocking button to remove both adapters and the attached handpiece.
8. Pull the handpiece apart from the adapters and wipe over the handpiece to remove any excess oil.
9. Store both adapters in the waste disposal drawer.
10. Prepare the high-speed piece for sterilisation.

**How to maintain slow-speed motors and turbines – four-holed border connection**

The slow-speed motor must be in the forward or the reverse position for solutions to run through correctly. Solutions should be run through once a day.

Follow these instructions.

1. Connect adapter 1 to the slow-speed motor or the four-holed border connection of the high-speed handpiece.
2. Push adapter 1 and the slow-speed/high-speed handpiece on to the attachment inside the Assistina. Place the spray outlets down on the high-speed handpiece.
3. Close the cover and the waste disposal drawer.
4. Press the program button for approximately two seconds and check the function display. Wait until the maintenance cycle is over and only then open the cover.
5. Grasp the slow-speed motor/high-speed handpiece to remove any excess oil and prepare the high-speed handpiece for sterilisation.

**How to maintain the Assistina**

Follow these instructions.

1. Once a week, or whenever necessary:
   - clean the outside only
   - do not use a scouring agent
   - use the W&H cleaning solution (green container)
   - squeeze the cover together lightly and lift it out, then clean the cover and wipe the inside of the unit with the W&H cleaning solution.
2. Clean the waste disposal drawer in a thermal disinfector.

3. Exchange O-rings where there are visual effects of the maintenance attachment (or every two months).

4. Renew the filter pack in the suction filter after around 7000 maintenance cycles. This corresponds to the consumption of a 500 mL bottle of W&H service oil (white container).

5. Check compartments once a week to make sure that they are full.

**Mechanical decontamination**

**Ultrasonic cleaners**

These remove debris not visible to the naked eye. They use ultrasound which causes vibration or cavitation.

**Procedure**

1. Put on heavy-duty gloves, protective eyewear, a mask and a protective plastic apron.

2. Remove gross debris from instruments by wiping them at the chair-side, taking care to avoid sharps injury. Rinse and dry any instruments contaminated with blood before you put them into the ultrasonic cleaner.

3. Fill the ultrasonic tank with the recommended cleaning solution. Place loose contaminated instruments into the ultrasonic cleaning basket – only eight to ten instruments as overloading decreases its efficiency.

4. Place the cover on the cleaning unit to prevent aerial contamination. Operate for the time recommended by the manufacturer – generally, five to eight minutes for loose instruments.

5. Remove the cover and lift out the cleaning basket. Rinse it under the tap.

6. Check instruments for cleanliness and for broken tips. Replace or re-clean items as required.

7. Dry instruments with disposable towel, and sort for disinfection or sterilisation.

8. Wash gloves with antimicrobial liquid soap.

9. Wash your hands.

The ultrasonic unit can be a source of contamination. It should be emptied and cleaned properly. The solution should be changed at least once a day and the unit wiped over with a surface detergent.
Degassing the ultrasonic cleaner

The ultrasonic cleaner needs to be degassed whenever a new solution is prepared. This procedure removes large air bubbles and makes for more efficient cleaning. It involves activating the unit for a total of 15 minutes once the fresh solution has been added and before you insert any items to be cleaned.

Cleaning methods

1. Basket cleaning
   
   Place items into the basket and place the basket into the main tank containing the cleaning solution. Activate the unit.

2. Beaker cleaning
   
   Place specialised or very small items such as burs into the beaker and add the cleaning solution – which may be a specialised solution like a cement remover. Suspend the beaker in the tank using the beaker-positioning rack. Place the beaker band around the beaker so that the bottom of the beaker is suspended in the back. Activate the unit.

Cleaning solutions

There are various specialised cleaning solutions available. It is important that you read the label on the bottle for instructions on dilution and use. Some examples are:

- BioSonic® General Purpose Cleaning Solution
- BioSonic® Germicidal Ultrasonic Cleaner Concentrate (UC-38)
- BioSonic® Enzymatic plaster and stone remover
- cement remover.

Cleaning

Clean all components daily by wiping them with a soft cloth moistened with a mineral deposit remover, followed by cleaning with an isopropyl alcohol or mild disinfectant.

Fig 9.10

Reproduced with permission of Whiteley Corporation.
Activity 13

Do you use an ultrasonic cleaning unit in your surgery? If so, have a look at the tasks in the checklist below and tick off those you know are performing correctly.

- Degassing correctly after having changed the solution.
- Removing gross debris at the chair-side by wiping instruments, eg spatulas.
- Rinsing instruments contaminated with blood and drying them on paper towel before ultrasonic cleaning.
- Filling the unit to three-quarters full with a recommended cleaning solution.
- Placing instruments loosely in the cleaning basket and not overloading the unit.
- Placing the lid on the cleaning unit.
- Operating the unit for the recommended time.
- Removing the basket and rinsing it under the tap, when finished.
- Checking instruments for cleanliness and cleaning again if necessary.
- Drying instruments and sorting for disinfection or sterilisation.
- Changing solution when visibly contaminated, or at least once a day.
Section 10 – Sterilisation

Sterilisation is the destruction of all microorganisms including viruses and spores.

Activity 14

Refer to your textbook, dictionaries and other resources to explain what is meant by the following terms.

virus

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

spore

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

Steam is the most widely used sterilising agent. During steam sterilisation, the combination of heat and moisture maintained at a preset temperature/pressure/time relationship coagulates cell protein and efficiently destroys microorganisms.

In dentistry, an autoclave is used for sterilisation. It uses moist heat in the form of steam under pressure – very similar to the way a pressure cooker operates.

Note: Before you subject any item to this form of sterilisation, you should check that it is suitable.
Preparing instruments for sterilisation using an autoclave

Decontaminated instruments are not considered clean enough for reuse on a patient. They must be sterilised in an autoclave to make them safe to use again.

Many instruments, eg forceps, endodontic and surgical instruments, have to remain sterile after they have been autoclaved. To keep them sterile, they must be placed in a package specifically designed for this purpose. Instruments may be packaged according to treatment requirements, eg basic restorative, suture or amalgam requirements.

The recommended packaging is self-seal laminated bags (or pouches). These are available in a variety of sizes to suit specific requirements.

Follow these instructions.

1. Place the instrument in the bag with the contaminated end first, so that after sterilisation when the bag is opened, the working end does not become contaminated.

2. Carry out all preparation for sterilisation in a ‘dirty’ area as the instruments are not yet ‘clean’.

3. Designate a dirty area and a clean area in relation to the autoclave to ensure effective workflow and to prevent contamination.

4. The outside of the autoclave is considered clean, so once you have placed the tray of dirty items into the autoclave, you must wash your hands before you close the door.

5. Load the items from the dirty area and unload them into the clean area. If you are preparing the autoclave for operation, eg by adding water, you must do so with clean hands.

6. Use distilled water in the autoclave to prevent corrosion and build-up of mineral deposits and operate it according to the manufacturer’s instructions.
7. The time taken for the items in the autoclave to reach the same temperature as the steam is called the ‘lag time’ or the ‘heat penetration time’. You must allow for this when you are calculating the cycle time for the autoclave, for example:

- lag time = 17 minutes
- sterilisation time = 3 minutes
- total cycle time = 20 minutes.

All packaging for sterilising instruments has an indicator which changes colour to show that the package has been through a cycle in the autoclave.

Instruments can also be contained in trays or cassettes which can be wrapped or bagged and sealed with indicator tape.

**Labelling and expiry dates**

When you are packaging items for sterilisation, you must indicate the date on the package for the purposes of instrument tracking. You can use a waterproof marker pen or a label.

If the packaging is not see-through (transparent) or the ends of the instruments are covered, you must also write the name of the instrument on the bag.
Instrument tracking

This is a system whereby critical instruments can be tracked back to a specific autoclave and cycle.

A critical instrument is one that is used in clinical practice to enter or penetrate a sterile tissue, a cavity or the bloodstream. It is used in the following procedures:

- oral surgery, including routine extractions, soft tissue procedures and surgical removal of teeth
- implant surgery
- periodontal surgery, including electrosurgery
- endodontic surgery.

All instruments used in critical sites need to be packaged/wrapped and sterile at the point of use.

A **semi-critical instrument** is one that comes into contact with mucous membranes or non-intact skin but does not penetrate soft tissue, does not come into contact with bone or enter into the bloodstream, eg mouth mirror, handpieces, impression trays, amalgam pluggers.

A **non-critical instrument** is one that comes into contact with intact skin, eg x-ray cane/head, facebow.
How to track an instrument

Once instruments have been manually or mechanically decontaminated, dried and bagged or packaged, they are ready to be labelled for tracking purposes. A tracking/label gun can be used for this purpose. Each label displays a steriliser identification number (particularly important if more than one steriliser has been used), a batch or cycle number and the date.

When the packaged item has been used, the label is taken off and placed on the patient’s chart as a record. If the information has been written on the package, it is the dentist’s responsibility to transfer all the relevant information to the patient’s chart.

The final component of the tracking process is the recording in a comprehensive log. This should be carried out for all cycles.

Log documentation can include:

- the date
- identification of the autoclave (particularly important if more than one steriliser has been used)
- the time the cycle started
- the cycle temperature and time parameters, eg wrapped or unwrapped cycle
- the nature of the load, eg number of packages or instrument cassettes
- the batch number of the packages included
- the results of the autoclave readouts or printouts for that cycle
- the result of the chemical indicator used for the cycle, eg colour change
- the signature or identification of the person who unpacked the autoclave, checked that all requirements were met and whether the cycle passed or failed.
## Tracking logbook example

<table>
<thead>
<tr>
<th>Date</th>
<th>Autoclave no.</th>
<th>Time cycle started</th>
<th>Cycle no.</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Contents of load, eg no. of packs**

<table>
<thead>
<tr>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
<th>Wrapped/unwrapped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Print name and sign**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Chemical indicator**

<p>| | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
Process validation sheet – Compact PCD/tracking

Date:

Trace

PCD

Sign:

Trace

PCD

Sign:

Trace

PCD

Sign:

Trace

PCD

Sign:
Process steam penetration test

Date: 

Cycle: 

© VET (WA) Ministerial Corporation 2012
Packing the autoclave trays

Follow these instructions.

1. Collect all the items that need to be sterilised and arrange them loosely in the autoclave tray(s) to allow for maximum steam penetration and circulation.

2. Tilt small instrument trays and bowls on an angle.

Note: Take care not to overload the autoclave.

Storing sterilised stock

All items should be dry at the end of the sterilising cycle. This should happen automatically if your autoclave has a drying cycle. If it does not have a drying cycle, bags can be left to dry in the autoclave. Any bags that still feel damp can be placed carefully into a warm, clean area, eg the top of the autoclave, until they are completely dry.

If you have bulk-sterilised restorative instruments and equipment as an uncovered load, these do not remain sterile but are termed ‘clinically clean’ once they have been removed from the autoclave. These items can be stored in the clean area or placed onto trays ready for use. Make sure they are covered at night to protect them from dust.

Items in bags can be stored in cupboards or drawers:
- in a clean, dry area
- 50 cm above the floor
- away from heavy traffic areas
- to the back with newly sterilised stock.

Monitoring and spore-testing autoclaves

Refer to *Torres and Ehrlich Modern Dental Assisting* to investigate the various ways in which you can monitor the autoclave load to make sure that items have been through the sterilisation cycle.

Summarise the information you find under the following headings.

process indicators

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
chemical monitoring


Bowie-Dick test
This is a daily autoclave test for the satisfactory removal of air from the package in the pre-vacuum stage of the cycle and for the resulting uniformity of steam penetration.

Reproduced with permission of 3M 2005.

Fig 10.4

Research
Why does the Bowie-Dick test sheet need to be the only item in the steriliser at the time of testing?
Using a steam incubator

When the correct biological indicators are used, you can monitor the effectiveness of the steam sterilisation. The standard spore used is *Bacillus stearothermophilus* as the growth of this organism is temperature-dependent. It is therefore critical that the correct indicators be used in the appropriate incubator.

Brown-coded indicators are for 270 °F gravity or 270 °F (132 °C) vacuum-assisted cycles.

Blue-coded indicators are for 270 °F (132 °C) gravity displacement cycles.

Using the incubator and the indicator

**Incubator**

Follow these instructions.

1. Write the steriliser identification number and the processing date on the indicator.
2. Place the indicator in a suitable pack, along with a load for the steriliser.
3. Process the load as usual. Once finished, allow at least 10 minutes for the indicator to cool down before you remove it from the pack.
4. Check the chemical indicator on the label for a colour change from rose to brown. (These colour changes on the indicator’s label do not indicate that the load is sterile. Always check the autoclave printout/log to confirm that the correct time, temperature and pressure have been reached.)
5. Incubate or refrigerate the indicator within two hours otherwise the spores – if alive – will die and failure to sterilise will go undetected.

**Note:** Indicators are 126, 126P, 1262 and 1262P.
Indicators

Follow these instructions.

1. Place the bottom of the indicator into the metal heating block at a 45° angle.

2. Push the indicator straight back. (This crushes the ampoule and activates the indicator.)

3. Push the indicator back down into the metal heating block, making sure that the cap remains above the metal block.

4. Incubate for a total of 48 hours. Check the indicator for colour change at regular intervals – every 8, 12, 18, 24 and 48 hours. If the indicator turns yellow, this means that there is bacterial growth. If there is no colour change, this indicates that the sterilisation cycle has been adequate.

5. Act on a positive result (change of colour to yellow) in the test indicator immediately. Re-test the steriliser by placing several indicators throughout a load and incubating them.

6. You can determine final sterility results after 48 hours.

7. Record your results.

Using controls

Follow these instructions.

1. Place an activated indicator (not sterilised) into the incubator each day. This must be the same lot and manufacturing date as the inductors being put through the steriliser.

2. Compare the control with the other indicators every time you check for colour change.
Disposal of indicators

Follow these instructions.

1. Sterilise positive indicators at 25 °F (121 °C) for 15 minutes, at 270 °F (132 °C) for 10 minutes or for four minutes in a pre-vacuum steriliser.
2. Dispose of them according to your surgery’s policy.

Storage of indicators

Follow these instructions.

1. Store indicators at room temperature.
2. Do not store them near sterilants or other chemicals.

Indicators usually have a two-year shelf life from date of manufacture.

Cleaning incubators

Follow these instructions.

1. Disconnect the incubator from the power source.
2. Do not immerse it in liquid of any sort.
3. Use disinfectant or mild detergent and, when cool, wipe over with a damp cloth.
Section 11 – Disinfection

Activity 15
Refer to Torres and Ehrlich Modern Dental Assisting and find a definition for ‘disinfection’.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

The National Health and Medical Research Council (NHMRC) recommends that all items used in a patient's mouth be sterilised using heat before they are reused in another patient's mouth. Therefore, disinfection is recommended only for items that are unable to withstand heat.

However, this is not cold sterilisation.
Activity 16

Tick the items that are disinfected at your workplace.

- some plastics, eg safety glasses
- impressions
- laboratory work
- radiographs

How to disinfect items in the workplace

Apply these general rules to effectively disinfect items in your workplace.

- Decontaminate thoroughly and dry all items.
- Use a purpose-specific container with a tray and a lid.
- Cover the container to avoid evaporation, contamination and exposure to vapour.
- Ensure that the disinfectant is in contact with all surfaces of the item.
- Use the recommended immersion time.
- Ensure that the immersion time begins after the last item has been added.
- Remove the tray then rinse items under running water.
- Dry items and store them in a clean area.
- Avoid skin contact with the solution.
- Use an extractor fan; area must be well ventilated.
- Change the solution regularly, or when visibly contaminated.
Activity 17
Research three different types of chemical disinfectant and fill in the table below with their details. If you can, choose one that you use in your own workplace, e.g. sodium hypochlorite.

<table>
<thead>
<tr>
<th></th>
<th>Solution 1</th>
<th>Solution 2</th>
<th>Solution 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immersion time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Items suitable for disinfection using this chemical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety issues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precautions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 12 – Maintenance of instruments and equipment

Instruments and equipment

It is essential that all instruments and equipment are in good working order. As a dental assistant, you have major responsibility in this area. It is important that you always read and follow the manufacturers’ instructions. If you are not sure what to do, contact the manufacturer or the company representative to get clarification.

Correct care and maintenance will extend the life of all equipment, reduce costly repairs and replacement, and prevent disruption to the daily operation of the practice.

Handpieces

It is particularly important to follow manufacturers’ instructions regarding the care of handpieces as they generally cannot withstand temperatures over 134 °C.

Is the autoclave in your workplace suitable for the sterilisation of the handpieces? Make sure that you are aware of the recommendations and restrictions that apply to the various types of equipment in your workplace.

Autoclaves

This equipment is expensive and correct care and maintenance will prolong its life. You can avoid costly repairs and disruptions to the daily running of the practice if you clean and maintain the autoclave regularly.

Some general rules apply but again it is important that you read the manufacturer’s instructions regarding the recommended cleaning and maintenance routine.

Follow these general rules when cleaning autoclaves.

• Make sure that the autoclave is switched off. Check the condition of the plug and cords.
• Clean from the inside to the outside.
• Ensure that detergents, abrasives, pastes or other chemicals are not used on the inside.
• Remove scaly deposits from the inside using only a scourer with warm water.
• Scrub and rinse trays thoroughly.
• Wipe the seals on the doors and check their condition. Lubricate with special gel if necessary and replace seals as required.
• Clean the outside with warm water, detergent and a soft cloth or sponge.

Remember that you must check the efficiency of the autoclave every week with spore tests.
Once a year a registered infection control technician must check the autoclave thoroughly and certify it as safe to use. This process is required by law and you must keep a logbook with all the inspection details signed and dated. The Act that regulates this is the *WA Occupational Health, Safety and Welfare Act 1984*. You can access this at <www.slp.wa.gov.au>. Select the link below ONLINE LEGISLATION DATABASES then on the left-hand menu, under ‘Acts’, click on ‘As passed’. Under ‘Browse Acts by title’, click on ‘O’ and select the Act.

**High-volume evacuator systems**

An evacuation system can be a mobile unit that has a collection bottle or jar inside it or a fixed system that is part of the dental unit, the contents of which are emptied into the sewerage system.

It is essential that these systems are flushed and cleaned daily.

Note the following general points.
- Following the aspiration of blood, flush the system through with a chlorine-based solution.
- Empty bottles or flush the system daily.
- Empty and clean filters regularly to prevent overloading the system. (Some units have up to three separate filters.)
- Use the solutions the manufacturer recommends.

**Protocols used to report faults and organise the servicing of equipment**

Every workplace has different requirements. Standard procedures should be established to record faults and organise the servicing of equipment.

It is essential that accurate records be maintained and information regarding servicing and maintenance routines be available to all staff. A list of service providers’ contact information must be regularly updated and easily accessible.

It is a good idea for you to implement a protocol for the servicing and maintenance of the equipment in your workplace if one does not already exist.

This could include a logbook containing practice protocols to be followed by all staff. This logbook could include details such as the date, equipment type, name, problem identified, name of repair and number, date sent and date resolved.
Section 13 – Monitoring and maintenance of autoclaves to Australian Standards®

Activity 18

This activity is for those of you who are currently working in a dental surgery or those of you who can gain access to a dental surgery.

Biological monitoring of the efficiency of the autoclave in your workplace

1. How can you be sure that the autoclave in your workplace is destroying all microorganisms?

   Refer to Australian/New Zealand Standard™ AS 4187:2003 Cleaning, disinfecting and sterilizing medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities and Torres and Ehrlich Modern Dental Assisting or literature from your workplace.
2. Complete the following for your workplace.

Brand name of the autoclave ________________________________

The operating cycles, including temperature, pressure and sterilisation time for each cycle.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

3. List the steps involved in operating the autoclave.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
4. List the recommended cleaning and maintenance routine for the autoclave.
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

5. What is the name of the usual service provider?
_________________________________________________________________
_________________________________________________________________

6. List the steps involved in the operation of the autoclave in your workplace. Use diagrams if you wish and attach extra pages if necessary.
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
References

Australian Standard® AS 4031:1992 Non-reusable containers for the collection of sharp medical items used in health care areas.

Australian/New Zealand Standard™ AS 4187:2003 Cleaning, disinfecting and sterilizing medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities.


Oral Health Centre of Western Australia (OHCWA), Infection Control Policy and Guidelines.
# Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABHR</td>
<td>alcohol-based hand rub</td>
</tr>
<tr>
<td>ADA</td>
<td>Australian Dental Association</td>
</tr>
<tr>
<td>aetiology</td>
<td>the systematic study of the causes of anything, especially of diseases</td>
</tr>
<tr>
<td>ANUG</td>
<td>acute necrotising ulcerative periodontitis</td>
</tr>
<tr>
<td>aspirate</td>
<td>to draw or remove by suction*</td>
</tr>
<tr>
<td>BSE</td>
<td>bovine spongiform encephalopathy</td>
</tr>
<tr>
<td>clean</td>
<td>free from dirt; not touched with unwashed hands or contaminated during procedures</td>
</tr>
<tr>
<td>contaminated</td>
<td>soiled by contact, with the potential to spread disease</td>
</tr>
<tr>
<td>CJD</td>
<td>Creutzfeld–Jakob disease</td>
</tr>
<tr>
<td>CWD</td>
<td>chronic wasting disease</td>
</tr>
<tr>
<td>DCA</td>
<td>dental clinic assisting or dental clinic assistant</td>
</tr>
<tr>
<td>deficiency</td>
<td>the state or fact of being deficient; lack; incompleteness; insufficiency*</td>
</tr>
<tr>
<td>disease</td>
<td>a morbid condition of the body, or of some organ or part; illness, sickness, ailment*</td>
</tr>
<tr>
<td>DNA</td>
<td>deoxyribonucleic acid</td>
</tr>
<tr>
<td>decontamination</td>
<td>removal of contamination; the initial cleaning of an instrument</td>
</tr>
<tr>
<td>dirty</td>
<td>not clean; contact with debris, the patient or saliva</td>
</tr>
<tr>
<td>disinfectant</td>
<td>removal of all microorganisms except viruses and spores using a chemical agent</td>
</tr>
<tr>
<td>endemic</td>
<td>peculiar to a particular people or locality*; present more or less continuously in a community, eg sleeping sickness in South Africa; dental caries in developed nations</td>
</tr>
<tr>
<td>epidemic</td>
<td>a temporary prevalence of a disease*; disease that spreads rapidly and attacks a large number of people in a community at the same time, eg influenza</td>
</tr>
<tr>
<td>FFI</td>
<td>fatal familial insomnia</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MRSA</td>
<td>methicillin-resistant <em>Staphylococcus aureus</em></td>
</tr>
<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
</tr>
<tr>
<td>pandemic</td>
<td>a disease prevalent throughout an entire country or continent, or the whole world*</td>
</tr>
<tr>
<td>pathology</td>
<td>the branch of medical science dealing with the origin, nature and course of diseases*</td>
</tr>
<tr>
<td>PPE</td>
<td>personal protective equipment</td>
</tr>
<tr>
<td>prognosis</td>
<td>a forecasting of the probable course and termination of a disease*</td>
</tr>
<tr>
<td>RNA</td>
<td>ribonucleic acid</td>
</tr>
<tr>
<td>sterilisation</td>
<td>removal of all microorganisms including viruses and spores</td>
</tr>
<tr>
<td>swab</td>
<td>wipe over a surface or area</td>
</tr>
<tr>
<td>TME</td>
<td>transmissible mink encephalopathy</td>
</tr>
<tr>
<td>work zone</td>
<td>dental chair, dental assistant’s area, patient’s bracket and operator’s area</td>
</tr>
</tbody>
</table>

*Reproduced with permission from Macquarie Dictionary online 2012, Macquarie Dictionary Publishers Pty Ltd.*
MAINTAIN INFECTION CONTROL IN DENTAL PRACTICE

HLTIN301C • HLTIN302B

Learner’s guide

DESCRIPTION
HLTIN301C Comply with infection control policies and procedures acknowledges the importance of complying with an effective infection control strategy that ensures the safety of the client (or end-user of health-related products/services), maintains personal protection and prevents the transmission of infections from person to person.

HLTIN302B Process reusable instruments and equipment in health work describes the skills and knowledge required for workers in the health care setting to clean and sterilise reusable instruments and equipment and to maintain associated environments. All procedures must be carried out in accordance with current infection control guidelines, Australian/New Zealand Standards™ and the policies and procedures of the health care establishment.

EDITION
2nd edition 2012

TRAINING PACKAGE
• HLT07 HEALTH TRAINING PACKAGE

COURSE / QUALIFICATION
• HLT31802 Certificate III in Dental Assisting
• HLT40702 Certificate IV in Dental Assisting (Dental Radiography)
• HLT40802 Certificate IV in Dental Assisting (assistance during General Anaesthesia and Conscious Sedation)

UNITS OF COMPETENCY
• HLTIN301C Comply with infection control policies and procedures
• HLTIN302B Process reusable instruments and equipment in health work