Learning Guide

Oral health care procedures

29454 Assist with oral health care procedures

Name:

Workplace:
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Introduction

Your role in the oral health care team is to provide person-centred support. To do this, you need practical knowledge about the many instruments, items of equipment, materials and medicaments that are used for various oral health care procedures. You also need to know how to support the other members of the team professionally, and look after the patient appropriately. This learning guide gives you information about what those tasks are and why they are important. This will help make sure you, your workmates and the people you support get the very best from you!

How to use your learning guide

This learning guide supports your learning and prepares you for the unit standard assessment. There are activities to do to guide your learning.

This guide relates to the following unit standard:

• 29454 Assist with oral health care procedures (level 3, 10 credits).

This learning guide is yours to keep. Make it your own by writing notes that help you remember things, or where you need to find more information.

Follow the tips in the notes column.

You may use highlighter pens to show important information and ideas, and think about how this information applies to your work.

You might find it helpful to talk to your workmates or supervisor.

Complete this learning guide before you start the assessment.

What you will learn

This topic will help you to:

• know about the instruments and equipment used and how to handle and maintain them.
• select and arrange instruments and equipment for each dental procedure, in their likely order of use.
• be familiar with the materials and medicaments used and how to handle and maintain them.
• process and store radiographs (x-rays).
• access the patient’s dental records and prepare the surgery.
• use zone and transfer techniques correctly when working with the dentist.
Instruments and equipment

Dental health care workers use a range of instruments, equipment, materials and medicaments to provide dental care treatment. This includes everything needed for radiography, or x-rays. You need to familiarise yourself with all the regular items used in your workplace so that you can effectively prepare the surgery for the procedures. You may also need to help the dentist during the procedures by handling and passing instruments correctly.

Using instruments and equipment correctly

All instruments and equipment must be used in accordance with:

- The New Zealand Dental Association and The Dental Council of New Zealand’s Standards.
- manufacturer’s guidelines.
- your workplace’s policies and procedures.

The Dental Council of New Zealand’s Infection Prevention and Control Practice Standard gives guidelines for the correct use of dental instruments and equipment. These guidelines include information on:

- the need for all instruments used in dental invasive procedures to be sterile at the time they are used.
- the requirements for the decontamination and sterilisation of all re-useable instruments and equipment.
- items that cannot be effectively sterilised or reused.
- the requirements for the decontamination and disinfection of equipment.

Manufacturers of equipment also provide guidelines for the correct use, handling and care of instruments and equipment. These guidelines must be followed so that the instruments and equipment are operated correctly and safely, do the job they are intended to do, in the manner intended and for their intended duration or lifespan.

Your workplace will also have policies and procedures on the correct and safe usage of instruments and their care. It is important that you follow these policies and procedures and ensure the instruments and equipment are used, handled, cared for and maintained appropriately and correctly.
Certain instruments are regularly used during different types of dental procedures. These procedures can be divided into different categories:

- examination, assessment and prevention.
- restorative.
- surgical.
- periodontal.

**Examination**

A dental examination is usually done on the first appointment with the patient or if they have not been to a dentist for a period of time. This procedure involves carefully inspecting the teeth, gums and mouth to check for signs of decay and disease. Any existing fillings will also be inspected and x-rays may be taken.

**Assessment**

An assessment will take place if the patient needs any additional dental procedures. The assessment involves checking the mouth for any signs of oral complications that may arise during treatments or procedures, including gum disease and decayed or infected teeth. These conditions may need to be treated before any procedures can take place.

**Prevention**

Prevention is about helping the patient minimise their chances of disease and teeth decay. It involves protecting the teeth and gums from potential disease and infections.

It also usually involves advising the patient on additional or proper oral hygiene, and advising them to have their teeth professionally cleaned and polished by a dental hygienist on a regular basis. Sealants may also be placed on teeth to help protect them from future decay.

**Restorative**

Restorative procedures like fillings are needed when a patient’s teeth need to be restored (returned) to their original structure or form. Restorative procedures are usually needed for the following problems:

- signs of decay (cavities or caries).
- previous restorations (replacements) have failed.
- the tooth structure has been or is wearing away.
Surgical

Surgical procedures are needed where restorative action will not be adequate. Some examples are when a tooth has decayed beyond repair or wisdom teeth have compacted. Work will include:

- extracting (removing) teeth and their roots.
- reimplanting teeth.
- minor soft tissue surgery, for example, biopsy.
- managing dental trauma (injury).
- managing cuts to the mouth.

Periodontal

Periodontal procedures are needed when the person has problems affecting the gums and soft tissues surrounding the teeth. Periodontal procedures are usually needed for:

- gingivitis (bleeding and swelling of the gums).
- periodontitis (gums pulling back from the teeth).

Instruments and equipment used in examination, assessment and prevention procedures

Instruments used for dental examinations, assessments and prevention procedures will include:

- 2x2s.
- autoclave.
- brushes.
- cotton pellets.
- cotton pliers.
- curing light.
- dental floss.
- DIAGNODENT.
- mouth mirror.
- probes/explorers.
- radiograph film.
- ultrasonic cleaner.
- x-ray machine.

Do it

Use this column to make notes about each instrument and piece of equipment.
2x2s

2x2s (two by twos) are small square pieces of cotton gauze. They are used to help keep areas of the mouth isolated and dry during a dental procedure. They are also used after an extraction (tooth removal) as a ‘bite down’ surface.

Autoclave

An autoclave is used to sterilise equipment by using high pressure steam.

Brushes

The dentist will use different types of brushes to clean the teeth. An interdental brush is a small brush that is usually disposable. They are used for cleaning in between teeth and between the wire of dental braces and the teeth. There are different widths available.

An end-tufted brush is designed for cleaning along the gum line beside the teeth. The bristles of the brush are shaped into a point and this enables the brush to reach into small areas between teeth.

Cotton pellets

Cotton pellets are placed between the tongue and the teeth, or between the cheek and the teeth to isolate and keep an area comparatively dry.

Cotton pliers

Cotton pliers are like sharp nosed tweezers. They are used to pick up small items (like cotton pellets) and place or remove them from the mouth.
Curing light

A sealant is usually applied to a tooth in liquid form or as a soft substance once a filling has been completed. The heat from a curing light helps hardens the substance quickly. It is a blue light.

Dental floss and floss pick

Dental floss is made of nylon or plastic. It is like a long thin fishing line and is used to remove food particles or plaque from between the teeth. The floss is used along the teeth sides and between the teeth. It can be waxed or unwaxed.

Diagnodent

A diagnodent is used to detect bacteria in teeth. A laser is shone into the pits and grooves of a tooth, and any bacteria present will fluoresce (glow). The fluorescence is measured and from that reading the dentist can ascertain how much decay is growing or is present in the tooth.
Mouth mirror

A mouth mirror can be single-sided or double-sided and is often disposable. It allows the dentist to easily see the inner surfaces and back surfaces of the patient’s teeth.

Probes/explorers

There are several different types of probes. They are used to explore the teeth and gums to see if there are any signs of disease and/or decay. They are used by a dentist to help find any:

- pits.
- fissures.
- calculus (tartar).
- plaque.
- problems with bridges, crowns and caries.

Radiograph film

Radiograph film is used to produce the image taken by an x-ray machine.

Ultrasonic cleaner

An ultrasonic cleaner is used to clean the instruments after use. It produces high frequency sound waves that agitate (shake) the dirt particles from the instruments.

X-ray camera

X-rays are used to detect any unseen caries in the teeth that cannot be seen normally during a check-up, or when the dentist suspects a problem, eg if an old filling may have decayed underneath.
Instruments and equipment used for restorative procedures

In addition to some of the instruments mentioned previously, the instruments used for restorative procedures include:

- air compressor gun.
- amalgam well.
- carver.
- cleoid.
- condenser.
- cord packer.
- dental hand piece or drill.
- double ended amalgam carrier.
- excavator.
- hemostat.
- irrigating syringe.
- matrix band.
- retraction cord.
- spatula.
- vacuum evacuator.

Air compressor gun

An air compressor produces dry air under pressure, and is applied via a hand held gun to clean and dry areas around the teeth or gums after drilling has been completed.

An air compressor is also used to power the suction tube for removing saliva from the mouth and for powering the dentist’s drill.

Amalgam well

The amalgam well holds the amalgam filling after it has been mixed. The dentist scoops the amalgam filling from the well with a double ended amalgam instrument to place it into the tooth.
Carver

A carver is used to make an amalgam (silver) filling shaped like the actual tooth.

Cleoid

A cleoid carver is a double-sided instrument used to carve amalgam.

Condenser

A condenser is used to press an amalgam (silver) filling into place into a tooth.

Cord packer

A cord packer is used to put the retraction cord in place between the tooth and gum.

Dental hand piece/drill

The drill used in dentistry is small and high-speed and usually incorporates a water spray. It is used to drill out and remove decayed tooth material before a filling is placed in the tooth.
Double-ended amalgam carrier

A double-ended amalgam carrier is used to scoop up the amalgam from the amalgam well and place it in the hole of the tooth. It is useful for large fillings. The dentist can use the other end to apply additional amalgam if required.

Excavator

An excavator is used to ‘spoon’ out decayed tooth material. The tips resemble small spoons.

Hemostat

A hemostat looks like a small pair of scissors but has small tips that allow the dentist to easily pick and place or retrieve small items in the mouth.

Irrigating syringe

Irrigating syringes are used to flush out an area in the mouth or teeth. An irrigating syringe is made from plastic and looks similar to an injection syringe.

Matrix band

A matrix band is a thin strip of plastic and is placed between the teeth to keep any filling material used on a cavity from bonding with another adjacent tooth.
Retraction cord

A retraction cord looks like a piece of thin woven string. It is used when the dentist is preparing a tooth to receive a crown. The cord is placed all the way around the tooth at the gum line. It allows the dentist to see the margins of the tooth. The dentist can take a perfect impression of the margins for the crown. The cord also helps stops blood from surrounding the tooth during the preparation.

Spatula

The spatula is not used in the mouth. It is used to mix dental materials such as amalgam.

Vacuum evacuator

The vacuum evacuator is used to remove debris, excess saliva and other liquids from the mouth during a dental procedure. It acts like a vacuum cleaner and sucks the debris and excess liquids from the mouth through a tube. It can be left in the mouth throughout the procedure or used as needed.
Instruments and equipment used for surgical procedures

The instruments used for surgical procedures include:

- anaesthetic syringe.
- anaesthetic needle.
- bite block.
- elevator.
- forceps.
- intra-oral camera.
- root canal files.
- scalpel.
- wedges.

**Anaesthetic syringe**

The anaesthetic syringe holds the cartridge containing anaesthetic and is used to administer a local anaesthetic into the gum.

**Anaesthetic needle**

Anaesthetic needles are attached to the anaesthetic cartridge by a plastic hub, and transfer the anaesthetic from the cartridge and into the gum. They are disposed of after use.
Bite block

A bite block helps a patient keep their mouth open during a surgical procedure. They come in different sizes for adults and children.

Elevator

Elevators act like levers. They help loosen the tooth from around the gum before it is removed. There are different sizes of elevators and some are used to loosen the root tips.

Forceps

Forceps are like pliers and are used to remove a tooth. There are different types of forceps designed to remove different types/sizes of teeth. Some of them have a locking mechanism to maintain a grip on the tooth being extracted.

Maxillary extraction forceps are used to remove upper incisors and canine teeth.

Mandibular extraction forceps are used for extracting the six front teeth and the four premolars.

Specialised extraction forceps are used to remove molars or very decayed crowns, small teeth or fractured roots.
Intra-oral camera

An intra-oral camera is a small pen-shaped piece of equipment that can take close-up photographs of a tooth or the mouth. The pictures can be displayed on a computer monitor to be viewed by the dentist.

Root canal files

Root canal files are used to clean the canals (roots) of the tooth. They increase in diameter and fit down the canals, allowing the dentist to remove the pulp of the tooth.

Scalpel

A scalpel is used to cut and open the gum in preparation for a bone graft.

Wedges

A wedge is usually used together with a matrix band to gently separate two teeth. This allows the dentist to fill a side cavity more easily. Wedges come in different shapes and sizes.
Instruments and equipment used for periodontal procedures

As well as some of the instruments mentioned previously, the instruments used for periodontal procedures include:

- periodontal probe.
- scalar.

**Periodontal probe**

A periodontal probe is used to measure the space between the gum and a tooth. There are segmented lines along the tip that are used as a measuring guide.

**Scalar**

The scalar is used to remove calculus (tartar) and plaque from teeth.
Handling and care of instruments and equipment

All dental instruments and equipment should always be handled correctly and with a great deal of care. Some dental instruments have sharp points or blades that have the potential to cause an injury, and if not sterilised, can transmit an infection to the dental care worker.

Your role will require you to ensure that instruments and equipment are correctly cleaned, stored and maintained. Your workplace will have policies and procedures about the correct and safe way to handle and care for instruments. Each instrument or piece of equipment will also have instructions given by the manufacturer for the safe use and care of that instrument. If you are ever unsure, ask the dentist or another experienced dental health care worker.

Cleaning and sterilising instruments

After a dental procedure, all instruments should be immediately cleaned even if they were not used in the procedure. Blood is corrosive to stainless steel (most dental instruments are made of stainless steel) and can cause rust and damage to the instruments. If it is not practical to clean the instruments immediately, they should be left in a pre-soak solution until they can be cleaned.

Instruments are either cleaned manually or by putting them through a machine such as a washer/disinfector or a special ultrasonic cleaner which uses sound waves to remove the dirt from the instruments. Items should be sterilised after cleaning. An autoclave sterilises the instruments by using steam.

The cleaning and lubrication of hand pieces (drills) is usually carried out in special equipment. To decontaminate a hand piece, run the drill hand piece for 30 seconds before disconnecting it from the surgery cart taking care to minimise spray dispersion while this is being performed. Remove any burs.

You should take great care when handling and cleaning sharp instruments. Always wear the appropriate personal protective clothing and equipment (PPE) when cleaning or maintaining instruments.
Sharpening instruments

It is important that dental instruments are kept sharp so that they work effectively.

The cutting edges of instruments are sharpened using a carborundum stone and special honing oil. The honing oil is a mineral oil that is the right consistency (viscosity) for sharpening instruments and it provides just enough lubrication to avoid friction and heat build-up that comes from hard surfaces being rubbed together.

How to sharpen an instrument with a flat edge

1. Apply a little honing oil to the surface of a flat carborundum sharpening stone.
2. Place the instrument’s flat cutting edge on the surface of the stone and then slide the instrument’s cutting flat edge (blade) backwards and forwards in a gliding motion, maintaining the correct angle of the instrument blade to the surface of the stone.
3. Periodically check the blade and test it for sharpness by cutting some gauze.
4. Repeat step 2 until the blade is sharp.
5. Once complete, rinse the stone under running water to remove excess oil and any metal fragments and leave it to dry. Do not use a towel to dry it as fibres may get stuck in the surface of the stone.
6. Use an ultrasonic cleaning machine to remove any excess metal particles from the instrument and then place it in an autoclave for sterilising.

How to sharpen an instrument with a curved edge

1. Apply a little honing oil to the surface of a cylindrical carborundum sharpening stone.
2. Carefully place the curved edge of the instrument blade against the surface of the curved stone and then, following the curve of the blade, rub the instrument along the stone while maintaining a good contact between the instrument blade and the stone.
3. Check the blade from time to time and test it by cutting some gauze.
4. Repeat step 2 if the blade is not sharp enough.
5. Once complete, rinse the stone under running water to remove excess oil and any metal particles and leave it to dry. Do not use a towel to dry it as fibres may get stuck in the surface of the stone.
6. Use an ultrasonic cleaning machine to remove any excess metal particles from the instrument and then place it in an autoclave for sterilising.

Do it

Go and find where your workplace keeps the carborundum sharpening stones, and make sure you know which is the flat one and which is the cylindrical one.
Materials

Materials are all the substances used during oral health care procedures. Materials such as gloves, gauze, cotton rolls and x-ray film will be used during all types of procedure, including examination, assessment, prevention, restorative, surgical and periodontal procedures. These items are used routinely and must always be available for the dental practice to function smoothly.

Materials used in restorative, surgical and periodontal procedures include:

- biomaterials.
- composite materials and polymer resins.
- dental implant materials.
- dental impression materials and silicones.
- adhesives.
- dental cements.
- dental metals and alloys.
- porcelain and ceramics.
- casting and bonding agents.
- sealants.

Key word

| materials | all the substances used during oral health care procedures |
Biomaterials

A biomaterial is a natural or artificial material used to treat, augment (increase or build up) or replace any tissue, organ or function of the body. Natural biomaterials include organs, collagen and other body parts such as a heart valve. Artificial biomaterials can be polymers, metals or ceramics. Biomaterials are used in dentistry to restore decayed, damaged or fractured teeth. They include:

- metals.
- ceramics.
- polymers.
- composite structures.

Composite materials and polymer resins

Composites are materials used for restorative procedures, such as filling cavities caused by dental caries. They are generally made from glass particles bound together with a polymer resin. These are also known as ‘white’ fillings and the composite materials can be made and coloured to resemble the natural colour of a patient’s teeth. Composite fillings are often used for front teeth and small holes in the back teeth where the biting load is not too great, and appearance is important.

Composite materials are also used:

- in place of traditional amalgam fillings because they do not contain mercury.
- to cover marks on teeth or to restore stained teeth.
- to repair chipped or broken front teeth.
- to enhance the shape of front teeth and improve the smile.

There are two types of composite resin fillings: direct or indirect.

In direct resin fillings, the dentist puts the soft material into position and then hardens it with a curing light. The light makes the single molecules in the resin link together to form a solid resin. As the resin can shrink, several layers of composite are added and photo cured (hardened). This photo curing allows the dentist time to work with the material, building and shaping it correctly before exposing it to the curing light.

For indirect resin fillings, the dentist prepares the tooth, takes an impression and a laboratory makes the filling. During a second visit, the filling is cemented into place.
Dental implant materials

A dental implant is an artificial tooth root made of surgical grade titanium. The implant is surgically placed into the jaw like a natural tooth root. An artificial tooth, or crown, made from porcelain or gold is then placed on top of the implant and attached to the implant’s post.

Dental implants can often be an effective method to replace a tooth or teeth lost through injury or periodontal disease. Dental implants can:

- replace one or more teeth without affecting adjacent teeth.
- support bridgework or replace a partial denture.
- help support or secure upper or lower dentures.

The benefit of implants is that they do not rely on neighbouring teeth for support. They are permanent and stable. Dental implants also help maintain facial structures. Natural tooth roots that are embedded in the bone help stimulate the bone and keep it intact.

When teeth are missing, the bone that previously supported those teeth melts away or deteriorates. This can lead to collapsed facial profiles which can be seen in lost lip support or increased wrinkles around the mouth. Dental implants help prevent this loss.

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A dental implant
Dental impression materials and silicones

Silicones are used to take dental impressions. A dental impression is an accurate representation of all, or part of, a person’s teeth and/or other areas of the mouth.

The dental impression material is placed in a dental impression tray and then into the patient’s mouth. The material sets and creates an imprint or a ‘negative model’. This can then be used to make a plaster cast or ‘positive model’. As the cast is a precise representation of the teeth, any dental prosthetic, such as crowns, will fit correctly and comfortably.

Common materials used to make impressions include condensation cured silicones and addition cured silicones. Each involves two parts that are combined to begin the curing process.

Adhesives

Dental adhesives are a type of dental glue. They are used to bond direct and indirect restorations. They commonly come in pastes (creams or gels) and powders. The adhesive is applied to the teeth or mouth to bond dentures, orthodontics, veneers or other restorations firmly in place within the mouth.

Dental cements

Dental cements are used as adhesives. Dental cements can be used to create and restore dental work. Uses include:

- long term cementation of structures such as crowns and bridges.
- temporary securing (when the restoration will have to be removed).

Types of dental cement are described in the following table.
<table>
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<tr>
<th>Type of dental cement</th>
<th>Description</th>
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| Zinc oxide eugenol    | Zinc-oxide eugenol comes in liquid and powder. There are two types:  
  - Type I is used for temporary cementation.  
  - Type II contains reinforcing agents that make it suitable for permanent cementation of cast restorations and applications. |
| Zinc phosphate        | Zinc phosphate comes in liquid and powder. It comes in two types:  
  - Type I is fine grain. It is used for the permanent cementation of cast restorations such as crowns, inlays and bridges.  
  - Type II is medium grain. It is used as insulation for the filling of deep cavities. |
| Polycarboxylate       | Polycarboxylate comes in liquid and powder and is:  
  - for permanent cementation of stainless-steel crowns and orthodontic bands.  
  - to make a non-irritating base under composite or amalgam restorations. |
| Glass ionomer         | Glass ionomer comes in a liquid and a powder form. There are three types of glass ionomer.  
  - Type I is used to cement metal restorations and direct bonded orthodontic brackets.  
  - Type II is used to restore eroded areas near the gingival.  
  - Type III is used as liners and dentin bonding agents. |
| Composite resin       | Composite resin is versatile when used as dental cement. It has a low film thickness and is insoluble in water. This makes it suitable for permanent cementation. It is used to:  
  - cement ceramic or resin inlays and onlays.  
  - cement ceramic veneers.  
  - cement orthodontic bands.  
  - allow direct bonding of orthodontic brackets.  
  - cement all metal castings. |
Dental metals and alloys

Dental metals are used for restorative procedures, such as the manufacture of crowns. Crowns can be used to:

- protect a weak tooth from breaking.
- restore a tooth that has broken or has been severely worn down.
- cover a misshapen or severely discoloured tooth.
- cover a dental implant.
- hold a dental bridge in place.

Dental crowns can be made from:

- metal.
- porcelain fused to metal.
- resin.
- ceramic.

A range of metals is used to manufacture dental crowns. These include noble metals, such as gold, palladium, platinum and silver and other non-noble or base metals such as copper, tin, nickel and beryllium. Most metals used in dentistry applications are alloys.

Gold

Gold has been used in dentistry for a long time, both for treatment purposes and because of its appearance and status as a precious metal. Gold alloys are easily workable due to their good pliability (ability to be easily shaped) and ductility (how much strain a metal can take before breaking).

Silver

Silver is mixed with other metals, such as tin and mercury, to create alloys. The mixture creates an amalgam that is used as a dental filling to repair damage caused by dental caries.

Palladium and platinum

Palladium and platinum are metals that are increasingly being used in dentistry because of the rising price of gold. Dentists have found that platinum and palladium alloys are cheaper and a more affordable alternative to gold alloys. Palladium is typically mixed with gold, copper, silver or zinc and is used for dental crowns or replacement teeth. It is also used with other metals such as copper, zinc, gold or silver. Platinum alloys are typically used as dental inlays, crowns and bridges.
Mercury

Mercury is a component of amalgam, which has been used for over 100 years to repair damage from dental caries. An amalgam is an alloy of any metal with mercury. Amalgam fillings are commonly called ‘silver’ fillings. Dental amalgam is a mixture of metals including silver, copper and tin to which mercury is added. Modern dental amalgam is made of:

- alloy powder (57 per cent to 46 per cent).
- silver, tin, copper with trace amounts of zinc, palladium and indium.
- mercury (43 per cent to 54 per cent).

There have been some concerns recently over the use of mercury in fillings because of the perceived health dangers. This is because very small amounts of mercury can leach (be released) from the amalgam filling and be stored in different parts of the body, such as the kidneys, liver and central nervous system.

The New Zealand Dental Association has stated: “The New Zealand Dental Association (NZDA) affirms the safety of dental amalgam as a restorative material and patients are assured that the current extensive scientific evidence shows amalgam fillings, whether old or new, do not constitute a threat to their health.” Source: The New Zealand Dental Association Inc; Position Statement on Dental Amalgam, 2009.

Alloys

Dental alloys are made when two or more molten (melted) metals are mixed and allowed to cool to form a new substance. Dental alloys may contain up to ten different metals. The combination of metals used and the percentage of each metal determine the properties of the alloy, and therefore how it is best used. Dental alloys are used for making crowns, bridges and dentures.

Alloys contain noble metals and base metals. Noble metals, such as gold, silver and palladium resist corrosion and oxidation in moist air. Base metals are less resistant to corrosion. Noble metals are often expensive whereas base metals are usually inexpensive.

Dental alloys can be classified into three main types.

1. High noble alloys have a noble metal content of 60 per cent or greater (such as gold, palladium or platinum). At least 40 per cent of the composition must be gold. High noble alloys are the easiest type of metal to work with. They give the most accurate crown fit and create the most predictable bond with porcelain.

2. Noble alloys have a noble metal content of at least 25 per cent.

3. Base metal alloys contain less than 25 per cent of noble metal. These alloys often contain large percentages of nickel, chromium or beryllium.

More info

The NZDA’s position statement about the safety of dental amalgam (including mercury) is online at www.healthysmiles.org.nz/assets/pdf/Amalgam_Statement_Final.pdf
Porcelain and ceramics

Porcelain or ceramics are made from ground up rock and minerals that are mixed with clay, shaped and then fired in a kiln. Clay is a particular type of mud that contains feldspar, quartz and kaolinite.

There are three main categories of dental porcelains or ceramics.

<table>
<thead>
<tr>
<th>Category of dental porcelain</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominantly glass</td>
<td>Dental ceramics that contain mainly glass have the best representation of the optical characteristics of enamel and dentin. Small amounts of filler particles control optical effects, such as opalescence, colour and opacity.</td>
</tr>
<tr>
<td>Particle-filled glass</td>
<td>Particle-filled glass ceramics contain additional filler particles for strength as well as thermal expansion and contraction. The advantage of particle-filled glass ceramics is that they can be etched, which makes these dental porcelains bondable.</td>
</tr>
<tr>
<td>Polycrystalline</td>
<td>Polycrystalline ceramics contain no glass. They are tough and strong. Their toughness does mean a 3-D computer system is necessary to create well-fitting dental restorations or substructures.</td>
</tr>
</tbody>
</table>

Dental porcelain is used for dental restorations, such as crowns, porcelain veneers and dentures.

Porcelain veneers

Porcelain veneers are custom-made wafer-thin shells of porcelain that are bonded to the front side of teeth. They cover imperfections to do with the tooth’s colour, shape, size, or position, as shown here.
Crows

Dental porcelain is commonly used in two types of dental crowns, ceramic and porcelain fused metal crowns.

All **ceramic crowns** are made completely from a dental ceramic, usually porcelain. They are generally used for the front teeth as they have the best and most natural looking appearance. They reproduce the colour of natural teeth and can capture and reflect light like natural teeth. This type of crown is harder to fit on the tooth as it needs to be thicker than porcelain-fused metal crowns and more tooth structure has to be removed.

**Porcelain-fused metal crowns** are a combination of porcelain and metal. The porcelain is fused over the metal substructure to create the crown. Porcelain-fused metal crowns are the strongest of all ceramic crowns and this strength means they are often used on the back teeth. The metal substructure also provides a more accurate fit over the tooth than an all porcelain crown. However, the appearance of a porcelain-fused metal crown may not be as lifelike as an all ceramic crown. This is because the metal substructure can show at the edge of the crown, particularly as the gum recedes with age. The metal can also cast a tint in the overlying porcelain.

Another common type of crown is the **stainless steel crowns**. These are pre-formed and made of metal, not dental porcelain.
Dentures

Dental porcelain can be used to make the teeth for dentures. The base of the dentures is made from acrylic resin that is coloured pink to resemble the natural tissues in the mouth. The false teeth can be made from porcelain or plastic (acrylic). Porcelain teeth are harder than teeth made from plastic, so they can chip or crack more easily. However, porcelain teeth are more wear-resistant.

Casts and casting agents

Dental impression materials make a ‘negative’ replica of the teeth and surrounding tissues, whereas dental casts provide a ‘positive’ replica. A dental cast is a prosthetic that is created using a process where liquid material is poured into a mould and then cooled to a solid. The customised resulting prosthetic provides an accurate, strong and comfortable fit for the patient. Prosthetics made by dental casts include: bridges, crowns, implants, dentures and partial dentures.

Dentists can use these casts to:

- examine how the teeth fit together and what may be stopping the patient from chewing or speaking well.
- explain to the patient the particular characteristics of their bite.
- show how a restoration will look when the work is complete.

Generally, casting materials can be divided into two main groups:

- ones that make the mould, such as die stone, dental stone or wax.
- ones that make the prosthetic, such as ceramics and metals.

The first part of the casting process is to make the mould for the prosthetic. Typical steps in making a casting include:

- taking a dental impression of the patient's mouth (a negative copy).
- mixing powdered stone materials such as dental stone or die stone with water (dental or die stone are the casting materials).
- pouring the casting material into the impression.
- allowing the casting material to set.
- connecting the casts to an articulator, if necessary. This shows the position of the teeth and reproduces the movement of the jaw.

If wax is being used to make a mould for a crown, the wax is softened with a Bunsen burner, applied and shaped to form the crown. This is specialised work that is done by a specialist dental technician.

The second part of the process is to make the prosthetic. Casting materials such as ceramics, porcelain powder mixed with water or metals, such as gold, silver and amalgam, are poured into the mould.
Bonding agents

Bonding is the application of a tooth-coloured composite resin (plastic) to repair a decayed, chipped, fractured or discoloured tooth. Bonding:

- improves the cosmetic appearance of discoloured or chipped teeth.
- closes spaces between teeth.
- makes teeth look longer.
- changes the shape or colour of teeth.

Bonding agents are composite resins that can be shaped and polished to match the surrounding teeth.

1. Select the composite resin colour that will have the best match with the colour of the natural tooth.
2. Etch the tooth surface to roughen it then lightly coat the tooth with a conditioning liquid to help the bonding material adhere.
3. Apply the resin and mould it until it is smooth and correctly shaped.
4. Harden the material with an ultraviolet light or laser.
5. Finish any other trimming or shaping that is needed after the bonding material has hardened.
6. Polish the material until it matches the sheen of the other teeth.

The composite resin used in bonding isn't as strong as a natural tooth. It can be chipped by actions such as chewing on pens or biting fingernails.

Sealants

Dental sealants are plastic coatings that are usually placed on top of the chewing (occlusal) surface of the permanent back teeth to help protect them from decay. The sealant is a tooth coloured acrylic ‘coating’ and can be used with children and adults.

Dental sealants protect teeth from plaque build-up and decay by providing a barrier. The chewing surfaces of the back teeth (molars and premolars) have pits and fissures that can be deep and difficult to clean, making them more vulnerable to decay and cavities. Dental sealants are a smooth surface that covers and hardens over the fissures.

Sealants

The dentist can apply:

- a liquid dental sealant on the tooth and harden it with a light.
- a two component dental sealant that sets without using a light.
Medicaments

Medicaments are agents used to treat orofacial injuries, ailments or conditions. They include:

- glass ionomers.
- topical fluoride.
- filling materials.
- calcium hydroxide.

### Key words

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent</td>
<td>a substance that brings about a chemical or physical effect or causes a chemical reaction</td>
</tr>
<tr>
<td>medicaments</td>
<td>agents that are used to treat orofacial injuries, ailments or conditions</td>
</tr>
<tr>
<td>orofacial</td>
<td>refers to the mouth and face</td>
</tr>
</tbody>
</table>

**Glass ionomers**

A glass ionomer is made from acrylic and a component of glass called fluoroaluminosilicate. Types of glass ionomers include:

- traditional that sets without a curing light.
- resin modified or hybrid composite that uses a curing light to set the material.

Glass ionomers are used:

- to cement inlay fillings.
- for fillings in front teeth.
- where there is a lot of decay in the part of the tooth that extends below the gum.
- for filling of baby teeth and cavities in children.
- as a liner for other types of fillings.

Glass ionomers match the colour of natural teeth. They release fluoride that helps to protect the tooth from further decay. However, they are weaker than composite resin and the fillings are more likely to wear or fracture.
Calcium hydroxide

Calcium hydroxide is used in **endodontic** procedures: the branch of dentistry that handles the structure, function and diseases of dental pulp. Calcium hydroxide is used as:

- a liner beneath restorations.
- a pulp capping agent.
- an anti-inflammatory agent.
- an antibacterial agent.
- a component of several root canal sealers.

**Calcium hydroxide paste**
This paste is pH 12.5, which kills most endodontic pathogens (bacteria inside the tooth) that it touches.

Topical fluoride

Fluoride benefits teeth by speeding up remineralisation and strengthening enamel. Strong tooth enamel helps prevent dental caries. Topical fluoride products are applied directly to the teeth, and include:

- toothpastes.
- mouth rinses.
- professionally applied treatments, such as gels, foams or varnishes.

Fluoride supplements can also be prescribed where this is appropriate.

Filling materials

Filling materials fill cavities and return the tooth to its normal shape and use. The type of material chosen for each procedure is based on:

- the extent of the damage.
- whether the patient has allergies to certain materials.
- where the filling is needed.
- cost.
<table>
<thead>
<tr>
<th>Type of filling material</th>
<th>Description and comments</th>
</tr>
</thead>
</table>
| **Gold fillings**        | • Made to order in a laboratory then cemented into place  
• Well tolerated by gum tissues  
• Do not corrode over time, last for over 20 years  
• Expensive  
• Require multiple visits to the dentist to fit |
| **Amalgam (‘silver’) fillings** | • Resistant to wear, strong and can withstand the forces of chewing  
• Relatively cheap compared to other materials  
• Have a distinctive colour so are more noticeable than porcelain or composite materials  
• Not usually used in visible areas, eg front teeth  
• Can be completed in one visit  
• Healthy parts of the tooth might have to be removed to make a space large enough to hold an amalgam filling |
| **Composite (plastic) resins** | • Matched to the same colour as the teeth  
• Have a more natural appearance  
• The ingredients are mixed and placed directly into the cavity, where they harden  
• May not be the best material for large fillings as they may wear over time  
• Can become stained from coffee, tea or tobacco  
• Do not last as long as other types of fillings (generally from three to 10 years)  
• Cost more than amalgam, but less than gold |
| **Porcelain/ceramic fillings** | • Produced to order in a lab then bonded to the tooth in a dental surgery  
• Can be matched to the colour of the tooth  
• Resist staining  
• More resistant to abrasion than composite resin  
• A porcelain restoration generally covers most of the tooth  
• More brittle than composite resin  
• Cost is similar to gold |
Handling and maintaining materials and medicaments

Dental materials and medicaments must be stored, prepared, handled and maintained correctly. Following the manufacturer’s instructions and the systems and procedures of your workplace will ensure the quality and effectiveness of the materials and medicaments.

Storing materials and medicaments

It’s important that dental materials and medicaments are always stored in accordance with the manufacturer’s specifications.

Some materials and medicaments are sensitive to light, temperature or life cycle and so must be stored correctly to maintain their effectiveness and quality. Light sensitive materials include phosphor plates, wet film product and filling materials such as Fuji II and sealants.

Materials sensitive to temperature include composite filling materials.

Medicaments such as local anaesthetic and topical fluoride have expiry dates that make them life-cycle sensitive, so they can only be used before their expiry date.

Materials and medicaments will come with instructions from the manufacturer, for example, store this product away from strong light and in the fridge at a temperature either below or not above a degree that is specified.

Some examples of instructions from the manufacturer
When storing materials, there are several important considerations.

- **Position:** Light and temperature sensitive materials should be stored away from windows, heaters or air conditioning units.

- **Stability:** Temperature sensitive materials should not be stored where they may be subject to large fluctuations in temperatures.

- **Rotation:** Life-cycle sensitive materials need to be rotated so that the older stock is used first before it expires and newer stock is retained until it is needed. Any dental materials or medicaments that are not used before the expiry date must be discarded.

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**Drawer of correctly labelled and stored dental materials**

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**Preparing and handling materials**

Dental materials or medicaments will have their own requirements for preparation and handling. When preparing and handling materials, you will need to follow both the manufacturer’s instructions and your workplace’s policies and procedures. You will need to be aware of:

- using the correct personal protective equipment (PPE) when handling materials.

- preparing the materials at the right time, eg not mixing dental composites too soon.

- preparing the materials in the right way and following the manufacturer’s instructions, eg mixing the correct amounts of liquids, powders and pastes.

- using the correct equipment when preparing materials.

- using the correct handling techniques to minimise any risk of infection or cross contamination.
Maintaining materials

All materials must be maintained to ensure there is a sufficient supply for a given period. Maintenance of materials includes:

- correct storage.
- access.
- stock taking.
- safety and security.
- shelf life.
- spoilage.

Storage and access

All materials and medicaments must be stored in conditions that preserve the effectiveness and quality of the materials or medicaments and is appropriate to the material or medicament. Storage must also allow for easy access to the materials and medicaments. It is important to think about what gets used the most frequently and ensure these are readily accessible. Stock should also be kept in the same place so that dental staff can find what they need quickly.
Stock taking

It is important that there is always an adequate stock of materials and medicaments.

Your workplace will have systems and procedures for maintaining stock levels and will have guidelines on:

- how much of any one item there should be in stock.
- how often items are replenished, eg replaced when stocks reach a certain level or stocks replenished when existing supplies have been completely used.
- how items that are used are tracked, so that replacements can be ordered.

The purpose of stock taking is to ensure there is an appropriate amount of stock available. Having too little stock means there is a risk of running out. Over-ordering could result in too much stock that may not get used within its expiry date and have to be thrown away.

When new stock is received at the dental surgery, it should be checked to ensure the order is correct and complete. Stock should then be put away promptly in its correct storage place and any paperwork (delivery docket, invoice) given to the correct person.

Safety and security

Maintaining materials and medicaments also involves ensuring their safety and security. Materials and medicaments are expensive and potentially a health risk if they are used inappropriately. They must be stored securely where they will be safe, and only able to be accessed by appropriate dental health care workers.

Shelf life and spoilage

Shelf life refers to the length of time that materials or medicaments are given before they are considered unsuitable to use. When dental materials and medicaments are being stored, they should be rotated, so that the older stock is used first. Items with the longest expiry date should be placed to the back so that materials with the shortest expiry dates are used first. Using stock within its expiry life prevents wastage.

Your workplace will have systems and procedures to check materials and medicaments to ensure they are within their expiry date.
Preparing the dental surgery

As a dental assistant, you have an important role in preparing the surgery for oral health care procedures and assisting the dentist and dental clinician with those procedures.

When preparing the surgery for oral health care procedures, you will be responsible for:

- accessing the patient’s dental records.
- applying infection prevention and control procedures.
- selecting instruments and equipment for each planned oral health care procedure.
- arranging the instruments in their likely order of use.

When preparing the dental surgery for oral health care procedures, it is important to follow the procedures of your workplace.

You should follow a set routine to reduce any risk of mistakes.

The routine may involve:

- removing instruments and materials used for the previous patient.
- returning the patient’s chair to the correct position.
- carrying out any infection prevention and control procedures.
- organising new materials for the new patient, eg headrest cover, bibs.
- seating the patient and attaching the bib.
- bringing the tray of instruments and any other equipment into the correct position.
- checking that the supplies (materials) that will and/or may be needed during the oral health care procedure are readily available.
Write

Using your workplace’s policies and procedures, list, in order, the tasks you need to carry out to prepare the dental surgery for the oral health care procedure.

Is the dental surgery always prepared in the same way for different oral health care procedures? Why or why not?
The planned oral health care procedure

It is important that you know and can describe the different oral health care procedures. Knowing the procedure and its requirements allows you to identify and select the right instruments, equipment and medicaments, and to prepare and arrange them.

You need to make sure that everything that is needed for a specific dental procedure is available, including all the required instruments and equipment for each step of the procedure.

Choosing the right instrument cassette for the procedure

Your role may also involve looking after the patient when they arrive at the dental surgery. This may include greeting the patient, answering their questions and helping to put them at ease. A patient may feel anxious or nervous and helping them to understand what is going to happen during the procedure can reassure them and ease their worry. If the patient is a child, this may involve giving information and reassuring the parents.
Retrieving and accessing the patient’s records

Preparing the surgery prior to the patient’s arrival also involves retrieving the patient’s records from the computer or file and having them available for the dentist or dental clinician to view before the procedure starts. For example, paper or electronic records should be available and any dental radiographs (x-rays) should be set out for view.

Records that you may need to access include:

- x-rays (panoramic, bitewing, periapical).
- lab or test results.
- examination and treatment records.
- information from other dentists or dental specialists who may have been consulted about treatment.
- information about the patient’s medical history.

Making the patient’s records available before the procedure enables the dentist and dental clinician to have the most recent information about the patient and the treatment that is required.

It is very important that the patient’s dental records contain complete, accurate and up-to-date information. If the person is a new patient, you will need to record contact details for them, their doctor and an emergency contact person. If the person is a regular patient, it is a good check when they arrive that their records are still correct. For example, have they had a newly diagnosed condition, any recent surgeries or illnesses, or any changes in medications.

If appropriate, the patient may also need to sign a consent form for the procedure to happen that day. This form should be filed with the patient’s records.
Applying infection prevention and control procedures

A key part of your role is to apply infection prevention and control procedures. These procedures are set out in the Dental Council of New Zealand’s *Infection Prevention and Control Practice Standard*, available at www.dcnz.org.nz and search for practice standards.

Your workplace’s policies and procedures will be based on this Standard, and will cover:

- your personal hygiene, including hand hygiene.
- protective equipment.
- procedures following a needle ‘stick’ injury.
- work methods.
- sterilisation, disinfection and decontamination of instruments and clinical surfaces.
- waste disposal.

Infection control is the responsibility of everyone in the workplace. You need to make sure you understand and follow all the policies and procedures relating to infection control in your workplace.

More info

There is detailed information about infection prevention and control in dentistry in the learning guide for 29395. This includes ways to protect people, ways to sterilise equipment and how to dispose of waste.
Selecting instruments and equipment

For each oral health care procedure, the dentist will need different types of instruments and equipment. You may be responsible for selecting and arranging the instruments and equipment required and arranging the instruments on the tray in the order the dentist is likely to need them.

The first step in preparing the instruments is to drape the instrument tray and any special work area with sterile towels. The instrument pack can then be opened and the instruments removed and laid out in the order they will be used. You should then cover the tray with a sterile towel until the procedure is about to start.

Your workplace will have its own guidelines and procedures. You will be expected to know and follow these.

Here is a checklist for selecting and arranging instruments in a surgery before a dental procedure. Tick each line as you check.

<table>
<thead>
<tr>
<th>Checklist for selecting and arranging instruments</th>
<th>Tick ✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear the correct PPE and follow the correct personal hygiene procedures.</td>
<td></td>
</tr>
<tr>
<td>Select the instruments and equipment required for the procedure (the instruments may be in sterilised, wrapped packs).</td>
<td></td>
</tr>
<tr>
<td>Arrange the required instruments on the tray and in the order the dentist is likely to use them, plus standard equipment such as mirror, explorer, and cotton rolls.</td>
<td></td>
</tr>
<tr>
<td>Make sure the required drill hand pieces are available.</td>
<td></td>
</tr>
<tr>
<td>Have the correct medicaments available, such as dental composites or a local anaesthetic that may be needed for the procedure.</td>
<td></td>
</tr>
<tr>
<td>Prepare any additional equipment that may be needed, such as matrix bands and gauze.</td>
<td></td>
</tr>
<tr>
<td>Review all the instruments and equipment that you have prepared and check everything is available for each step of the procedure.</td>
<td></td>
</tr>
<tr>
<td>Ensure the tray is conveniently located for the dentist to use.</td>
<td></td>
</tr>
<tr>
<td>Follow any other instructions given to you by the dentist about the selection and/or arrangement of the instruments to be used in the procedure.</td>
<td></td>
</tr>
</tbody>
</table>
As well as the specific instruments and equipment that you need to set up for each procedure, you also need to prepare some standard items for the patient, for example:

- glass of mouth wash.
- tissues.
- bib.
- dental floss.

**Write**

Take a photo of a dental tray that you have set up for an examination.

<table>
<thead>
<tr>
<th>Attach photo here</th>
<th>List the instruments, equipment and materials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Examination, assessment and prevention**

Examinations and assessment procedures involve inspecting the teeth, gums and mouth to check for signs of decay and disease and evaluating the significance of a problem. Fillings may also be inspected and assessed. Prevention procedures help to minimise the chance of dental disease and decay and protect teeth and gums.

Instruments that you may need to select and arrange for an examination include:

- mouth mirror.
- explorer.
- probes.
- cotton pliers.
- 2" x 2" gauze sponges.
Restorative

Restorative procedures are used when the patient's teeth need to be restored to their original structure or form. Restorative procedures are usually required for the following problems:

- decay and cavities in the teeth.
- previous fillings have failed or broken.
- the tooth structure itself is wearing away.

Instruments and equipment that you may typically need to select and arrange for a restorative procedure may include:

- carver.
- cleoid.
- condenser.
- cord packer.
- dental hand piece/drill.
- double ended amalgam carrier.
- excavator.
- haemostat.
- irrigating syringe.
- matrix band.
- retraction cord.
- spatula.
- mouth mirror.

Many restorative procedures may also require a local anaesthetic to be administered by the dentist. A tray with the necessary equipment may need to be prepared for this, and will involve:

- selecting the correct cartridge of local anaesthetic.
- selecting the correct needle length.
- preparing the anaesthetic syringe.
- preparing 2" x 2" gauze sponges or cotton-tip applicator.
Surgical

Special surgical procedures are needed when making changes to a person’s teeth or jaw. Surgical procedures may include:

- extracting (removing) teeth and their roots.
- reimplanting teeth.
- minor soft tissue surgery, eg biopsy.
- managing dental trauma (injury).
- managing cuts to the mouth.

Typical instruments and equipment that you may need to select and arrange for a surgical procedure include:

- bite block.
- elevator.
- forceps.
- root canal files.
- various scalpels.
- wedges.

Periodontal

Periodontal procedures are needed when the person has problems that affect the gums and soft tissues surrounding the teeth. Periodontal procedures are usually needed for the following problems:

- gingivitis (bad breath, bleeding and swelling of the gums).
- periodontitis (gums pulling back from the teeth).

The instruments and equipment that you may need to select and arrange for this type of procedure include:

- periodontal probe.
- scaler.
Assisting with oral health care procedures

When assisting with planned oral health care procedures, you will be responsible for:

- transferring requested instruments and equipment to the dentist during a procedure.
- providing consistent assistance to the dentist or dental clinician during the procedure.
- providing assistance that supports the patient and contributes to the patient’s wellbeing and safety.
- carrying out exit procedures with the patient.

Correct passing and receiving of instruments and materials to the dentist or dental clinician is a task that must be thoroughly practised. Practice allows you to work efficiently with the dentist or dental clinician and provide the best possible assistance.

Following correct procedure

There will be times when you need to directly assist the dentist with the oral health care procedures being performed. In these situations, you will need to follow the correct procedures and principles of fourhanded dentistry. These principles are designed to help:

- the dental assistant and the dentist to work co-operatively and as a team in a seated position.
- promote efficiency, safety and comfort.
- reduce strain, stress and fatigue.
- make correct and effective instrument transfers during surgical and similar procedures.
- provide a high quality professional service in an efficient and effective way.

These are the basic principles of fourhanded dentistry.

- Equipment must be positioned to minimise unnecessary reaching.
- The patient, dentist and dental assistant should be seated comfortably in ergonomically designed chairs/stools.
- The dentist requests and delegates appropriate tasks to the dental assistant.
- The procedure is planned in advance in a logical sequence.

These principles require planning and organisation and should be carried out before the procedure begins.
Planning should include:

- knowing the procedure so you can prepare the right instruments and materials in advance.
- knowing the procedure so you can anticipate the sequence in which the instruments and materials will be used by the dentist.
- developing a standardised routine for basic dental procedures.

The concept of fourhanded dentistry can be broken down into three basic categories.

- work simplification.
- movement economy.
- zones of work activity and positioning.

**Work simplification**

Work simplification involves:

- eliminating instruments and items of equipment from the tray that will not be required.
- arranging instruments on the tray in a manner that will assist the dentist and improve selection access.
- locating additional equipment nearby.

**Movement economy**

Economy of movement allows physical energy to be conserved and back strain reduced during a procedure. This may include:

- positioning instruments and equipment in advance of the procedure.
- positioning the instruments on the tray in a manner that allows for easy access and minimises extended reaching.
- placing equipment such as the amalgamator or curing lights in a convenient position so that the dental team can reach them with minimum effort.
- placing the patient in a supine position in the dental chair and adjusting the height and angle of the chair so that the amount of bending by the dental team during a procedure is reduced (The supine position is where the dental chair is reclined almost flat and the patient is facing upwards).
- the provision and height adjustment of mobile stools for the dentist or dental clinician and assistant.
Zones of work activity

Once the patient is seated, the area around them is divided into zones of activity. There are four main zones:

- zone of activity for the dentist/dental clinician.
- zone of activity for the assistant.
- transfer zone.
- static zone.

The **dentist or dental clinician zone** is the area where the dentist or dental clinician works, and the **assistant’s zone** is the area where the dental assistant works.

The **transfer zone** is the area where the instruments are exchanged between the dentist/dental clinician and the dental assistant.

The **static zone** is where the least amount of activity or movement happens and is designated as the area where the instruments and other items, such as the portable curing light or the assistant’s tray are placed.

Every exchange between the dentist or dental clinician and the dental assistant should take place in the transfer zone – over the patient's chest area and under their chin. The instrument should be carefully exchanged so that it is not accidentally dropped.
Take extreme care when transferring instruments.
• Always pass instruments in the transfer zone.
• Never pass them over the patient’s face.
• Do not intrude into other zones when passing instruments.
• The dentist may change position depending upon the tooth area being treated, resulting in the work zones moving around.
• The assistant may need to raise their chair for a better view of the lower arch.

**Positioning**

The position of you in relation to the dentist and the patient is important for the smooth flow of the procedure. Part of effective instrument exchange is dependent on how you and the dentist are positioned around the patient. As the dental assistant, you should:

• position your mobile stool close and to the left of the patient and the dentist.
• centre your torso (upper body) on the chair.
• adjust the height of your stool so that your torso (upper body) is aligned with the patient, and you are sitting 10–14 cm higher than the dentist.
• rest your feet on the foot support of the stool parallel to the floor.
• use the upper body support bar of the stool to support your body when leaning forward.
• keep your neck and back as straight as possible.
• avoid reaching or twisting.
• position equipment so it can be easily reached.

---

**Positioning**

The body support is moved around to the front to support the torso when leaning forward.
Techniques for transferring instruments

It is important that you safely and correctly give and receive instruments to/from the dentist. This is so that:

- the dentist can keep an uninterrupted vision of the operative field.
- time is saved and unnecessary movements are avoided.
- stress and strain is reduced.

An important requirement of successful instrument transfer is your knowledge of the procedure. By understanding what will happen at each stage, you will be able to anticipate and meet the dentist’s needs.

It is also important to have clear communication with the dentist so that you know when an instrument exchange is required. The communication may be verbal (spoken) or non-verbal, such as a signal or gesture.

There are two main techniques for transferring dental instruments:

- instrument transfers.
- instrument grasps.

Instrument transfers

The basic instrument transfers are:

- single handed.
- double handed.

Use the single-handed transfer during the most common procedures. The dental assistant transfers instruments with one hand while holding the oral evacuator tip and air/water syringe in the other hand.

When transferring instruments with a single-handed transfer to a right-handed dentist, the dental assistant transfers the instruments with their left hand. When working with a left-handed dentist, the dental assistant transfers using their right hand.

A double-handed transfer requires the dental assistant to pick up the instrument with one hand and deliver the new instrument with the opposite hand.

The photos show the correct procedure when making a single-handed instrument transfer to a right-handed dentist.
Single-handed instrument transfer to a right-handed dentist

**Step 1**
From the tray of instruments, pick up the required instrument to be transferred in your left hand using your first finger and thumb to hold the instrument at the handle or non-working end of the instrument.

**Step 2**
When the dentist is ready to exchange an instrument, they will remove the unwanted instrument from the patient’s mouth with their right hand using their thumb and first finger, while still maintaining a finger rest with the fourth finger on the patient’s open mouth, and extend their arm towards the assistant in the transfer zone.

**Step 3**
The unwanted instrument is then grasped by the dental assistant using their third and little finger, while still holding the ‘new’ instrument between their thumb and first finger.
Step 4
By folding the third and little finger into their palm, the dental assistant moves the unwanted instrument out of the way and delivers the ‘new’ instrument (still in between the thumb and first finger) into the dentist’s hand by slightly turning their hand and wrist.

Instrument grasps

Instruments grasps include the pen grasp and the palm grasp.

Pen grasp
The pen grasp is the most common grasp. It is similar to the grip used when holding a pen or pencil. This grasp is used for holding most operative instruments.

Palm grasp
The palm grasp is used to transfer bulky instruments such as surgical forceps between members of the dental team.
Providing consistent assistance to the dentist

It is important that the assistance you provide to the dentist during oral health care procedures is consistent with the:

- Dental Council of New Zealand’s relevant Codes of Practice and Standards.
- policies and procedures used in your workplace.
- particular requirements of the procedure.
- correct way that the procedures are done.

Providing a consistent and high standard of assistance to the dentist ensures a high standard of care to the patient is maintained. It also ensures the dentist/dental hygienist is able to concentrate on the procedure they are performing, knowing they can trust your abilities, and that the instruments, equipment or materials they need are provided at the right time and in the right way. Other benefits of providing consistent assistance include a saving in time, improved efficiency, seamless transition of instruments, a stress-free environment and professional team work.

Not providing consistent care can compromise treatment and can create problems that may have ongoing effects for the patient, the dentist or dental surgery.

Providing assistance that supports the patient

The assistance that you provide must also support the patient and contribute to the patient’s wellbeing and safety. It is equally important that the assistance you provide is within the boundaries of your own role and follows the policies and procedures of your workplace.

Supporting the patient can include:

- greeting the patient when they arrive.
- reassuring a nervous patient and putting them at ease before, during, and after a procedure.
- communicating with and managing the patient in a way that is appropriate for their age and culture.
- preparing the patient for the procedure, eg seating them in the surgery chair and attaching the bib.
- asking questions appropriately to obtain basic information about the patient and their needs.
- projecting an attitude (or manner) of professionalism, confidence and skill. This will help put the patient at ease.
• providing information or answering questions about the procedure and what the patient can expect. This must always be within the boundaries of your role, eg you will not be able to give clinical information or advice to a patient or parent but you can give information on general oral health or tooth care.

If the patient is a child, you may need to assist the dentist with behaviour management, eg by providing appropriate distractions or holding the child’s hand.

Working within the boundaries of your own role is important because it:

• ensures the patient receives the correct information.
• ensures patients only receive procedural care from staff who have the qualifications and dental training.
• promotes the patient’s wellbeing and safety.
• minimises any risk of misunderstanding by the patient.
• shows respect for the knowledge and expertise of the dentist and other dental clinicians.
• ensures the dental surgery runs smoothly and efficiently as everyone knows their roles and tasks.

Carrying out patient exit procedures

In your role as a dental assistant, you may need to carry out exit procedures for patients in accordance with your workplace’s policies and procedures.

Exit procedures include:

• completing an invoice and taking payment.
• making a follow up appointment.
• giving further information about oral hygiene.
• assisting the patient out of the surgery.
• recording or updating information in the patient’s records.
• filing the patient’s records and/or any other associated documents, for example, x-rays.
• preparing the surgery for the next patient.
Preparing for taking dental radiographs

Dental health care workers often assist the dentist when taking dental radiographs (x-rays). X-rays are important in dental care because they can reveal problems that the dentist may not see in a visual examination.

X-rays can:

- expose areas of decay, particularly in difficult areas, for example, tiny pits of decay that might occur between teeth or be developing underneath a filling.
- show cracks or other damage in fillings.
- highlight possible bone loss that may indicate periodontal disease.
- show problems in the root canal.
- reveal infection or irregular growth.

X-rays also assist the dentist to plan dental work, monitor tooth growth and tooth development in children.

X-rays can be classified into two categories:

1. Intra-oral – where the x-ray film is placed inside the mouth.
2. Extra-oral – where the x-ray film is placed outside the mouth.
Regulatory requirements

There are a number of legal requirements that surround the taking of dental radiographs. The x-rays can only be taken by those qualified to do so, who are over the age of 18 and are either:

- a dentist licensed under the Radiation Protection Act 1965.
- a person with an appropriate scope of practice under the Health Practitioners Competence Assurance Act 2003 who is working under this licensee.

All x-ray equipment, including dental x-ray machines, must also be under the control of a person who holds an appropriate licence issued under the Radiation Protection Act 1965.

The use of x-rays in dental diagnosis must comply with the Code of safe practice for the use of x-rays in dentistry, which states the minimum legal requirements and the currently accepted standards of safety that must be met. It covers working procedures, x-ray equipment, using radioactive material or irradiating equipment, and the protective materials necessary. This code was produced by the National Radiation Laboratory, a specialist unit of the Ministry of Health (the ministry which administers the Act).

A copy of this code is provided to all licensees in dental radiography. Licensees have a responsibility to provide access to the code to all people who may use or have x-ray equipment under their control.

Some key considerations from the code are:

- an x-ray examination should not be performed unless the benefits to the patient outweigh any radiation risks.
- the useful x-ray beam should be restricted to the area of clinical interest only and be confined to as small an area as possible.
- only those people who are required to assist, or who are training, should be present when x-rays are being taken.
- the occasional use of non-radiation personnel to give assistance is acceptable but should involve the full use of protective equipment and procedures.

Preparing radiographic equipment and materials

There are specific materials and equipment that are used for taking dental radiographs. The equipment and materials that need to be used will depend on the information the dentist needs. Equipment and materials used when taking dental radiographs include:

- radiographic film.
- film packet holders.
- film processing and digital radiography equipment and materials.

Radiographic film

Special radiographic film is used to capture the image produced by the x-ray. The x-ray sensitive film, which has been placed in the film holder, is put inside the patient’s mouth and to one side of the teeth. The x-rays are beamed through the patient’s jaw to the teeth being examined.

In the x-ray image:
- white areas represent the denser parts of the mouth (bones and teeth) where the x-rays could not penetrate through to the film.
- dark areas represent the parts of the mouth where the x-rays could penetrate (skin and mouth tissue).
Different types of film are used to capture different information.

<table>
<thead>
<tr>
<th>Type of film</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-oral film</td>
<td>Used to identify different dental structures.</td>
</tr>
<tr>
<td></td>
<td>• Periapical film for teeth and the surrounding tissue. It is usually large enough to capture about three teeth.</td>
</tr>
<tr>
<td></td>
<td>• Bite-wing that captures the position of the upper and lower teeth to show the teeth position when the teeth are biting together.</td>
</tr>
<tr>
<td></td>
<td>• Occlusal, which is similar to periapical film. It can capture the entire upper and lower arches of the teeth being examined.</td>
</tr>
<tr>
<td>Extra-oral film</td>
<td>Used to examine the jaw, facial bones, joints and other large areas.</td>
</tr>
<tr>
<td>Panoramic film</td>
<td>Used to show the entire jaw and surrounding bone structure.</td>
</tr>
</tbody>
</table>

The film should be stored in a cool, dry place because high temperatures and moisture can cause it to deteriorate. A small refrigerator or lead-lined boxes can be used for storage to prevent the film being exposed before it is used.

**Film storage**

There should always be enough film in stock so that when an x-ray is required, it can occur during the patient’s appointment. Film also has a use-by date and cannot be used past that date.
Film packet holders

A film packet holder is used to hold the radiographic film while it is in the mouth. It helps hold the film in the correct position and stops the film from bending when the mouth is closed when taking an x-ray.

The holder may include a bite block which the patient can hold between their teeth to keep the film in place. It may also include an x-ray beam aiming device which centres the x-ray beam on the film packet.

There are different sized film holders and film packets and their selection depends on the type of tooth or teeth being x-rayed.

The following table shows the types of holder and film packet that would be the ideal to be used for different teeth.

<table>
<thead>
<tr>
<th>Type of teeth</th>
<th>Holder</th>
<th>Film packet size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incisors and canines</td>
<td>Anterior holder</td>
<td>Small film packet</td>
</tr>
<tr>
<td>Premolars and molars</td>
<td>Posterior holder</td>
<td>Large film packet</td>
</tr>
</tbody>
</table>

Labelling and filing dental radiographs

To ensure the correct x-rays are matched to the patient, the holders/containers for the films should be labelled with the patient's name, address, the date the x-ray was taken and any other required information. You should familiarise yourself with how to correctly label and file the x-rays in accordance with your workplace’s policies and procedures.

Once the dentist has viewed the x-ray(s) it should be placed in the patient’s file for future reference and safe-keeping.
Safe work practices for x-rays

Safe work practices are an essential part of dental radiography.

The x-ray is produced by beaming low-level radioactive ‘rays’ onto the area the dentist wishes to examine in more detail. These rays are captured to create an image either on special x-ray film or digitally. Cumulative or excessive exposure to x-rays can however be harmful to a person because it can potentially change or alter the cells in a person’s body. Therefore great care and caution should be used.

In practice, minimising exposure to radiation is achieved by:

- maximising the distance between the patient and the x-ray machine operator, and other dental care workers.
- staying at least two metres away from the x-ray radiation source.
- using existing walls and doors, or lead screens as shielding.

Where the film, holder or pad need to be held in position, it is usual for the patient to hold it. A dental health care worker should not hold the patient, the film, the x-ray film cassette, other imaging equipment or the x-ray machine in position during the exposure unless it is otherwise impossible to obtain a diagnostically useful image.

If the patient is unable to hold the film in their mouth, another person who is not exposed to repetitive x-rays could be asked to help, eg the receptionist, friend of the patient etc. As this person will be exposed only a few times it will be safe, whereas a dental health care worker could have frequent cumulative exposure. Any person who does need to hold the film or film holder during the x-ray exposures should wear a leaded apron, and where practicable, leaded gloves.

Never expose any part of yourself or another person (except the patient) to the x-ray beam.

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**Workplace signage**

![Body-Protected Electrical Area](image)

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**Personal protective equipment**

Personal protective equipment is designed to protect both you and the patient when x-rays are being taken. PPE minimises the danger from radiographic rays which can be harmful in high or repeated doses. This table describes different PPE for taking x-rays.

<table>
<thead>
<tr>
<th>PPE item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead aprons</td>
<td>Lead aprons can be worn by the patient to block out the x-rays to the chest area.</td>
</tr>
<tr>
<td>Lead screens</td>
<td>Lead screens can be used to shield the operator or dental professional from repetitive exposure to x-rays.</td>
</tr>
<tr>
<td>Thyroid screens (collars)</td>
<td>These are designed to shield the patient’s neck from exposure to x-rays.</td>
</tr>
<tr>
<td>Protective glasses</td>
<td>These are specifically designed to shield the eyes from x-rays.</td>
</tr>
<tr>
<td>Lead gloves</td>
<td>These are gloves to protect the hands and arms from excessive exposure to radiation.</td>
</tr>
<tr>
<td>Structural shielding</td>
<td>Where there is no access to a separate room, special shielding should be positioned while taking an x-ray.</td>
</tr>
<tr>
<td>Dosimeter</td>
<td>This detects and measures radiation. It is worn at neck level or on the upper chest.</td>
</tr>
</tbody>
</table>
Always make sure there is the correct protective equipment available, in good condition, and that a recognised safe procedure is in place when taking x-rays. This involves:

- following all your workplace’s policies and procedures for the supply and use of PPE when taking dental radiographs.
- following all the manufacturer’s instructions for the safe and correct use of the PPE.
- providing the correct PPE to the dentist, the patient and yourself.
- regularly checking the PPE to ensure it still offers good protection.
- documenting any maintenance or repairs performed on the PPE or x-ray machine.

**Write**

Tick the protective equipment that you use in your workplace.

Add any other equipment that you also use when taking x-rays.

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

Other equipment used in my workplace includes:

![Dosimeter](image)
Workplace procedures

When taking dental radiographs it is essential, for your safety and the safety of others, to follow your workplace’s policies and procedures. These may include:

- working quickly and efficiently to reduce the time using an x-ray machine.
- using the shortest x-ray exposure time suitable to the film being used, to ensure the lowest possible radiation exposure.
- making sure you are following the correct technique to reduce mistakes and the need to repeat the process.
- recording how much x-ray radiation you and the dentist are exposed to.
- never standing in front of the x-ray beam.
- preferably standing behind the patient’s head, as this is the area of less scatter from radiation.
- using a radiation shield, or leaving the room wherever possible when the x-ray is being taken. If there is no shield available or another room you should be at least two metres away from the x-ray radiation source.

Two-metre distance

The photograph shows the safe, two-metre distance from the patient chair and where the operator should be standing when operating dental radiography equipment.
Processing dental radiographs

Once x-rays have been taken, there are two ways of reproducing the final x-ray image:

- digital radiography.
- film processing.

Digital radiography is increasingly common, however film processing is also still in use.

Digital radiography

Digital radiography removes the need to use films or chemicals to produce the final x-ray image. With digital radiographs, film is replaced with a flat, electronic pad or sensor called a film plate and a digital x-ray sensor is used to take the x-ray. The image is then displayed as a digital file on a computer screen.

It is important that:

- the plates are handled correctly to maintain infection control.
- the correct name is selected from those displayed on the scanx computer prior to scanning the plates.
- the plates are re-sleeved in new barrier envelopes after scanning to prevent cross infection.
- the process is completed on the scanx computer to enable the images to be transmitted to the appropriate computer.

The advantages of digital radiography include:

- there is no film processing stage.
- the image is available immediately for viewing on screen.
- the image can be enhanced:
  - to see detail.
  - to correct over or under exposure.
- the image can be emailed to another dental specialist.
- the digital file can be electronically stored as part of the patient’s medical record, eliminating bulky storage cabinets.
Film processing

Film processing involves developing the radiographic film using special chemicals. Once the film has been exposed, it must be developed to allow the image to become visible. The process is done either manually or by a film processing machine.

Dental radiographs that are taken with radiographic film must be correctly processed to obtain a quality image.

Once the x-ray has reached the film, the film is ‘exposed’. To see the image, the exposed film has to be processed. This process is called ‘developing’ and involves a number of processing stages where the film is passed through a series of chemical solutions (developer, water and fixer) in the correct sequence, for a set amount of time and at a set temperature.

There are two methods for processing film:

- **manual** method, which requires you to transfer the film through the solutions.
- **automatic** method, which uses a machine to transfer the film through the solutions.

The darkroom

The developing process can only occur in a darkroom. A darkroom has no sunlight or white light from a light bulb coming into it, as these would damage the film. Instead, photographic safelights, which emit only red or orange light, let you see what you are doing. The film’s manufacturer’s instructions specify appropriate safelights.

Always check that it is safe to do so before entering a darkroom, because opening the door could allow white light to enter and damage any x-ray film that is being processed.

The darkroom should also be well ventilated with an extractor fan to remove any chemical fumes.
Manual method

The manual method involves passing the exposed film through a series of chemical baths (the developer and the fixer) at set times, order and temperatures. Each stage must be done in a darkroom and following the manufacturer’s instructions.

1. Ensure the work area in the darkroom is clean, tidy and the chemicals are prepared as per the manufacturer’s instructions.

2. Ensure the chemicals are fresh, and at the correct levels in the separate baths.

3. Wash your hands and put on gloves.

4. Turn out the light, and turn on the safelight.

5. Place the exposed film into the film holder, being careful to only hold the film at the edge.

6. Set the timer for the development processing stage.

7. Turn on the timer and immediately immerse the film holder into the developer bath. Gently agitate and move the film holder up and down in the bath to ensure bubbles do not form on the surface of the film as they may cause blemishes on the processed film.

8. Remove the film holder from the developer solution when the timer has stopped/sounded.

9. Let the excess developer solution drain off and rinse the film in the running water bath for 20–30 seconds.

10. Remove the film holder from the water bath and let the excess water drain off.

11. Set the timer for the fixer solution and place the film holder in the solution.

12. Remove the film holder from the fixer when the timer has stopped/sounded.

13. It is now safe to turn on the main light.

14. Wash the film holder in running water for 10 minutes to ensure all the fixer is removed.

15. Hang the film holder carefully on the drying rack in the drier.

16. Remove the film from the holder when it is dry.

17. Take care when removing the film from the hanger as the film will be soft and easily scratched. Complete hardening of the film will usually occur within 10–15 minutes.

18. Once it has dried, the dentist can view the image to make a diagnosis.
Temperature

For manual processing, the manufacturer’s instruction sheet supplied with the film will recommend a development temperature. Use a photographic thermometer to check the various processing baths before you start work. This temperature is usually 20°C for four to five and a half minutes, but can vary depending on the film type and the chemicals used. The fixing temperature is usually equal to that of the developer but is less critical.

Timing

Follow the manufacturer's instructions for how long the film should be in each solution, otherwise the image may not be usable. Always use an accurate timer, clock, or stopwatch to ensure the timing is correct.

Mixing the chemicals

The manual method of processing will require you to correctly mix the developer and fixer chemicals with water as per the manufacturer’s instructions for dilution rates. Always wear gloves when mixing the chemicals, and do it in a well-ventilated room.

Film holders

Use the right x-ray film holder or hanger to handle the film. Extra-oral films have a different type of holder to the intra-oral films which use clip and hinge ones. Hold the film by the edges when putting it into the holder, to minimise damage from scratching or finger marks.

Chemical baths

Chemical baths hold the processing solutions. Check before use that there is enough solution in the bath to cover the film. The chemicals deteriorate on exposure to air, so always cover the baths with floating lids when not in use.

Follow the manufacturer’s instructions about when to change the solutions – this is usually determined by the amount of film passed through the solution and its age. As a general rule, solutions should be replaced every month, or after several hundred films per litre have been processed. If higher temperatures are used, the developer oxidises more quickly so the solution will need to be changed more often.
Cleanliness and safety

It is very important to keep the darkroom and work area clean and organised. Everything should be stored appropriately and chemicals labelled correctly.

Film is very sensitive to light, temperature and chemicals so there should also be a strict cleanliness regime in place. Clean up any chemical spills immediately, because if the film touches any chemical spots on the bench it could ‘pre-develop’, which would ruin the image.

If space permits it is a good idea to have a wet and a dry bench – one for the baths of solution, and one for loading the film into the hanger. Never mix the developer and fixer together as this will change the chemical composition and how they are supposed to work. Use a sink for mixing the chemical solutions and flush away any spills.

When mixing, replenishing, changing or disposing of chemicals, always wear the appropriate personal protective equipment, for example:

- rubber gloves.
- apron.
- safety glasses.

Automatic processing

Automatic processing follows the same processing stages as the manual process, but a machine automatically transfers the films between each chemical bath. There are two main groups of processors:

- basic units that are automated versions of the manual development process. These usually operate at close to normal temperature.
- more sophisticated units that have a conveyor film transport system. These usually operate at higher temperatures.

When processing dental radiographs automatically, you may need to:

- check there is a sufficient amount of chemicals in the machine.
- turn the machine on before the films are processed to allow enough time for the chemicals to come up to the right temperature.
- check the temperature of each solution with a thermometer.
- maintain the activity and life of the solutions by replenishing them as required.
- keep all the working parts of the machine clean.

If your workplace uses an automatic processor, follow the manufacturer's instructions when using it.
Mounting and securing dental radiographs

Once the film is completely dry it can be removed from the holder. When handling the film, ensure your hands are clean and dry and wear thin, light cloth gloves to avoid finger marks on the image.

A film mount is used to display the radiographs. They are made from cardboard, plastic or vinyl sheets. The film should always be mounted with the embossed (raised) dots on the film facing the person viewing the x-ray image. This ensures the radiographs are viewed from the correct anatomical position and the right way round.

Write

What are the steps you take to process, mount, secure and store dental radiographs? List the steps below.
Preparing and maintaining radiographic equipment and materials

The equipment and materials used in processing dental radiographs must be prepared and maintained properly.

Safe practice

There are legal compliances around the use of x-rays in dentistry practice. These compliances are designed to promote your safety, the patient’s safety and the safety of other members of the dental health care team.

Each piece of equipment, the film and the materials used will have instructions from the manufacturer. It is important that you follow these instructions, to make sure that everything works as it is meant to.

Your workplace will also have procedures for you to follow. It is important that you only prepare and/or maintain equipment that is within the boundaries of your role so that legal compliances can be met and everyone’s safety is maintained.

Every time an x-ray is taken, there is a very small exposure to radiation. Every dental x-ray that is taken increases that exposure in a cumulative way, so by observing the regulations and only completing the tasks that are within the boundaries of your role, you will reduce the potential for errors or mistakes and exposure to x-ray radiation.

Part of maintaining x-ray equipment is making sure it is returned to a safe storage position after use.

X-ray equipment in a mobile dental clinic
Maintaining stocks of film and chemicals

Film

All stocks of unexposed radiographic film and processing chemicals should be stored in a cool and safe place, following these guidelines:

- as all film has an expiry date, use the oldest film in stock first. When new film is purchased, store it behind the older stock in a cool place, such as a small refrigerator or lead box.
- a regular stocktake needs to be done to make sure that there is enough film stock to meet the expected needs of the practice but not so much that expired film has to be thrown away.
- store the film on its edge rather than laying it flat as the film is less likely to warp or stick together.
- if not using a refrigerator to store the film, check that the heat, humidity and light in the storage room are at appropriate levels for the type of film being stored by referring to the manufacturer’s guidelines on the box.

Chemicals

Maintaining processing chemicals involves:

- storing them carefully on a shelf in a safe and secure place.
- not placing them in positions where they could mix or interact once they are opened.
- ensuring the heat, humidity and light of the storage room are at appropriate levels for the type of chemicals being stored by referring to the manufacturer’s guidelines.
- maintaining the stock level of the chemicals in a similar way to x-ray film, with the old chemicals being used first before new stock is opened for use.
Handling equipment and chemicals correctly

When handling x-ray equipment, it is important to:

- only handle equipment that you have been trained to use.
- follow all your workplace’s policies and procedures about using the equipment.
- wear the correct PPE and ensure the integrity of all protective equipment has been tested and checked.
- know emergency and shut down procedures.
- make sure the equipment has been annually checked and any required maintenance has been performed.

When handling processing chemicals, it is important to:

- only use the chemicals after you have read the manufacturer’s safety data sheet and the instructions for their use, and you know how the chemicals should be used.
- always wear the correct PPE.
- avoid any physical contact with the chemicals.
- know the safety procedures of your workplace and the appropriate first aid procedures in the event of an accident. For example, if any chemicals splash onto your skin or into your eyes, wash the affected area immediately and seek medical assistance if required.
- ensure there is adequate ventilation in the area you are working in.
- ensure the room is at an appropriate temperature and humidity level.
- ensure the areas where chemicals are used or stored are appropriately signed.
- dispose of used chemicals correctly and in accordance with your workplace’s policies and procedures, and those of the local council.
## Glossary

### Key words

<table>
<thead>
<tr>
<th>term</th>
<th>definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent</td>
<td>a substance that brings about a chemical or physical effect or causes a chemical reaction</td>
</tr>
<tr>
<td>materials</td>
<td>all the substances used during oral health care procedures</td>
</tr>
<tr>
<td>medicaments</td>
<td>agents that are used to treat orofacial injuries, ailments or conditions</td>
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<tr>
<td>orofacial</td>
<td>refers to the mouth and face</td>
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