Workbook
Assist with dental radiography
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Before you start

Welcome to this workbook for:

Assist with dental radiography

Unit Standard 27449.

For this unit standard you will have:
- This workbook.
- A trainee assessment.

In this workbook you will learn more about:
- Regulatory requirements for dental radiographs.
- Preparing equipment and materials for taking radiographs.
- Processing radiographs.
- Preparing and maintaining equipment and materials for processing radiographs.

How to use this workbook
- This is your workbook to keep – make it your own by writing in it.
- Use highlighters to identify important ideas.
- Do the learning activities included throughout this workbook. Write your answers in the spaces provided.
- You might find it helpful to discuss your answers with colleagues or your supervisor.
- Finish this workbook before you start on the assessment.

Take note!

When you see a sticky note like this, it gives a tip or hint.
Workbook activities

Stop – check what you know about this topic
You will see this stop symbol in places where you are asked to stop and think about what you know and:
- Record your current knowledge or impressions.
- Check your knowledge.

This stop provides a reference point to return to later. Stop activities have blue shading like this.

Learning activities
You will come across learning activities as you work through this workbook.

These activities help you understand and apply the information that you are learning about.

Learning activities have yellow shading like this.

Rewind
When you see this rewind symbol, go back to:
- Think about what you know.
- Check your knowledge.

This rewind gives you an opportunity to add to, change or confirm some of your initial thoughts and ideas. Rewind activities have green shading like this.
Before you go any further in this workbook, think about...

# Taking x-rays

<table>
<thead>
<tr>
<th>How do you maintain the x-ray and processing equipment?</th>
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<table>
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<tr>
<th>What are the safe work practices and regulations that need to be adhered to when taking x-rays?</th>
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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.

In addition x-rays 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.

Wall-mounted x-ray machine
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).

The code is available from:

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.

Key considerations from the code include:

- 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 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 then beamed through the patient’s jaw in the vicinity of the teeth being examined. As the bones and teeth within the jaw and mouth are denser than the skin and tissue they absorb more of the x-rays and create a clear (white) image on the film.
In the x-ray image:

- The white areas represent the denser parts of the mouth (the bones and teeth) where the x-rays could not penetrate through to the film.
- The dark areas represent the parts of the mouth where the x-rays could penetrate (the skin and mouth tissue).

Different types of film are used to capture different information.

<table>
<thead>
<tr>
<th>Types of film</th>
<th>Description</th>
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<tbody>
<tr>
<td>Intra-oral film</td>
<td>Used to identify different dental structures.</td>
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<td></td>
<td>- Periapical film for teeth and the surrounding tissue. It is usually</td>
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<td>large enough to capture about three teeth.</td>
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<tr>
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<td>- Bite-wing that captures the position of the upper and lower teeth to</td>
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<tr>
<td></td>
<td>show the teeth position when the teeth are biting together.</td>
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<tr>
<td></td>
<td>- Occlusal, which is similar to periapical film. It can capture the entire</td>
</tr>
<tr>
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<td>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 type of radiographic film selected will be determined by the particular information required, using the least amount of exposure to the x-rays.
The film should be stored in a cool, dry place because high temperatures and moisture can cause the film to deteriorate. A small refrigerator or lead-lined boxes can be used for storing the film to prevent the film being exposed before it is used.

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 it is essential that the film is not past its expiration date. Ensure that the film can be used up before it expires.

**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.

It 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.

When choosing a film packet holder it is important that the correct holder and size of film is selected. There are different sized film holders and film packets and their selection depends upon 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>
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</thead>
<tbody>
<tr>
<td>Incisors and canines</td>
<td>Anterior holder</td>
<td>Small film packet</td>
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<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.

LEARNING ACTIVITY

In the space below attach, or draw, an example of how you label radiographs. Then briefly explain below how you file these radiographs.

How radiographs are labelled and filed in my workplace:
**LEARNING ACTIVITY**

Consider three patients who have needed dental radiographs taken. For each patient, complete the table below.

<table>
<thead>
<tr>
<th>Patient</th>
<th>What procedure required the x-ray to be taken?</th>
<th>What radiographic equipment and materials were selected?</th>
<th>Why were these materials appropriate for that procedure?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
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<td>Patient 2</td>
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<td>Patient 3</td>
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Safe work practices

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 when taking x-rays.

Creating a distance in space between you and the patient is one of the main ways to avoid radiation exposure. 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 enlisted to help for instance 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.

It is important to remember that safety starts from how you use equipment. You should never expose any part of yourself or another person (except the patient) to the x-ray beam.
**LEARNING ACTIVITY**

It is important to work safely with x-rays.

<table>
<thead>
<tr>
<th>Read a copy of the <em>Code of safe practice for the use of x-rays in dentistry</em>, and then list the points that you think are most important to your safety and the safety of your co-workers and patients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>What policies and/or procedures does your workplace have in place that address safety when using or assisting with the taking of x-rays, and using the x-ray equipment?</td>
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</table>
Personal protective equipment (PPE)

Personal protective equipment (PPE) 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. The following table describes different PPE for taking x-rays.

<table>
<thead>
<tr>
<th>PPE item</th>
<th>Description</th>
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<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>
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<tr>
<td>Dosimeter</td>
<td>This detects and measures radiation. It is worn at neck level or on the upper chest.</td>
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</tbody>
</table>

You should always ensure there is the correct protective equipment available and that a recognised safe procedure is in place when taking x-rays.
**LEARNING ACTIVITY**

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>
<th>PPE item</th>
<th>Tick</th>
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<tbody>
<tr>
<td>Lead aprons</td>
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<tr>
<td>Lead gloves</td>
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<tr>
<td>Structural shielding</td>
<td></td>
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<tr>
<td>Dosimeter</td>
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</table>

Other equipment used in my workplace includes:
Making PPE available to the dentist

As a dental health care worker, part of your role will be to make sure that the personal protective equipment is available to the dentist and dental staff and that it is in good condition. 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 condition of the PPE to ensure it still offers good protection.
- Documenting any maintenance or repairs performed on the PPE or x-ray machine.

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.

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

What policies and/or procedures does your workplace have for the use of PPE when you are taking dental radiographs? **List** them in the table below.

<table>
<thead>
<tr>
<th>Policies and procedures used in my workplace</th>
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Processing dental radiographs

Once the x-rays have been taken, there are two ways of reproducing the final x-ray image:
- Film processing.
- Digital radiography.

Film processing is the traditional way of developing dental radiographs. Recently however, digital radiography has developed as an alternative method.

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, thus eliminating bulky storage cabinets.

With the advent of a special x-ray scanner, traditional film x-rays can now be converted into a digital file enabling them to be viewed as a digital file or emailed and archived digitally.
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”. In order 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 by which the exposed film can be processed:
- 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 should have no sunlight or white light from a light bulb coming into it. The radiographic film is sensitive to white light and will continue to expose if it is left in the light.

Special photographic safelights, which emit only red or orange light, should be fitted so that you can see what you are doing. The safelight should be compatible with the film being used and you should check the film manufacturer’s instructions to ensure the use of an appropriate safelight. The darkroom should also be well ventilated with an extractor fan to remove any chemical fumes.

You should always take great care when entering a darkroom to make sure it is “safe” for you to do so, as opening the door to the darkroom could allow white light to enter and damage x-ray film being processed.
Manual method

The manual method involves passing the exposed film through a series of chemical baths (the developer and the fixer) for a predetermined time, at a set temperature and in a strict sequence. Each stage of the process must be carried out in a darkroom and be done in accordance with the manufacturer’s instructions.

The following steps are involved in developing dental radiographic film manually:

1. Ensure the work area in the darkroom is clean, tidy and the chemicals are prepared properly 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 developer 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
The temperature of the processing chemical baths is very important. Refer to the manufacturer’s instructions for the correct processing temperature of the various chemical baths and use a photographic thermometer to check the temperature of the various processing baths before you start work.

For manual processing, the manufacturer’s instruction sheet supplied with the film will provide a recommended development temperature. This is usually 20°C for four to five and a half minutes, but can vary depending upon the manufacturer’s stipulated temperature, film type and the chemicals used. The fixing temperature is usually equal to that of the developer but is less critical.

Timing
How long the x-ray film stays in the various chemical baths is very important. The film being processed needs to:

- Be developed for the correct length of time so as to not over or under develop it. Over or under development can affect the quality and detail of the image.
- Be immersed in the fixer bath for the correct amount of time so that the unexposed parts of the film are rendered non light sensitive through their removal. Unexposed parts of the film are rendered clear (white) as are the teeth or bone parts – where the x-ray did not penetrate through to the film.

You should refer to the manufacturer’s instructions to see how long the film should be left in each solution and 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. It is important that you read and understand the manufacturer’s instructions before mixing the chemicals as the temperature and ratio of chemical to the parts of water is critical. Solutions should be made up at the dilution rates given by the manufacturer. Always wear gloves when mixing the chemicals, and do it in a well-ventilated room.
**Film holders**
Use the correct x-ray film holder or hanger to handle the film. Extra-oral films will have a different type of holder to the intra-oral films which use clip and hinge holders. Take care when placing the film into the film holder. Only hold the film by the edges to minimise the risk of damage caused by scratching or finger marks.

**Chemical baths**
Special chemical baths are used to hold the processing solutions. The baths should always be checked before using them to ensure there is enough solution in the bath to cover the film. As the chemicals in the processing baths deteriorate on exposure to air, the baths should always be covered with floating lids when not in use. The solutions should also be checked and changed on a regular basis to ensure they work correctly and have not deteriorated.

Follow the manufacturer’s instructions on when to change the solutions in the baths – this is usually determined by the amount of film passed through the solution and its age. As a general rule the solutions in the baths should be replaced every month, or after several hundred films per litre have been processed. Where higher temperatures are used, the solution will need to be changed more frequently as oxidation of the developer occurs more quickly.
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. Ensure any chemical spills are cleaned up immediately. Any chemical spots or spills on a work bench can cause the film to “pre-develop” should they come into contact, 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. The developer and fixer should never be mixed together as this will change the chemical composition and the way 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, eg:

- Rubber gloves.
- Apron.
- Safety glasses.

When manually processing film:

- It must be carried out in a designated and ventilated darkroom.
- Temperature of the solutions is critical.
- The amount of time the film is in each solution is important.
- Mixing of the chemicals needs to done to the manufacturer’s instructions.
- Film holders should be used to hold the film during the processing.
- Wear gloves when mixing and using the chemicals.
- The floor and workbench area should be free from chemical spills.

Take note!

Take care when entering a darkroom so white light does not enter.
Automatic processing

Automatic processing follows the same processing stages as the manual process. The difference between the two processes is 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, you should 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.
LEARNING ACTIVITY

What are the steps you take to process, mount and secure dental radiographs?
List the steps in the table.

Steps I take in my workplace to process, mount and secure dental radiographs

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
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Preparing and maintaining equipment and materials

The equipment and materials that are used in the processing of dental radiographs must be prepared and maintained properly.

Safe practice

There are legal compliances that exist 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.


All equipment must be prepared and maintained in accordance with the manufacturer’s specifications. Each piece of equipment, the film and the materials used will have instructions from the manufacturer. It is important that you follow these instructions as these specifications are to ensure that equipment and material operates 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 ensuring it is returned to a safe storage position after use.

This photo is of x-ray equipment in a mobile dental clinic.
Maintaining stocks of radiographic film and processing chemicals

Film
All stocks of unexposed radiographic film and processing chemicals should be stored in a cool and safe location. The following guidelines should be followed:

- As all film has an expiry date it is wise to use the oldest film in stock first. As new film is purchased it is a good idea to store this behind the older stock in a cool place, such as a small refrigerator or lead box.
- There needs to be enough film stock to meet the needs of the practice on a monthly basis but not so much that expired film has to be thrown away. A stocktake and a balance must be maintained to ensure there is sufficient film stock to cover the expected requirement, but not so much stock that it passes its “use by date” and has to be destroyed.
- It is also a good idea to 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.
### LEARNING ACTIVITY

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>How and where do you store stocks of unexposed x-ray film in your workplace?</td>
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<tr>
<td>How do you maintain the stock level of x-ray film in your workplace?</td>
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<td>How do you ensure the oldest film is used first?</td>
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</table>
The correct handling of radiographic film, equipment and chemicals

Handling of radiographic film, equipment and chemicals must always be done in accordance with the manufacturer’s instructions and any legislative requirements.

Legislative requirements are documented in:
- The *Code of safe practice for the use of x-rays in dentistry*.
- Your workplace’s health and safety policy and documentation.
- The manufacturer’s safety data sheets that accompany each chemical.
- Any local authority or health regulations surrounding the disposal of chemicals.

When handling the film, it is important to:
- Avoid physical damage to the film surface, e.g., creasing, folding, buckling, scratching or finger prints.
- Use only the correct film holders so that there is no distortion of the film.
- Unpack film in the allocated location within your workplace.
- Keep the film away from spilt chemicals, and bright light.
- Wear the correct PPE.

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.
LEARNING ACTIVITY

List below the actions you need to take when:

<table>
<thead>
<tr>
<th>Storing unmixed chemicals in your workplace</th>
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<tbody>
<tr>
<td>Handling chemicals</td>
</tr>
<tr>
<td>Handling x-ray equipment</td>
</tr>
</tbody>
</table>
What practices and processes may you change as a result of the information in this workbook?
Completion and assessment

Congratulations!
You have come to the end of the workbook. Please check over all the activities in this workbook to make sure you have completed them.

Your assessment is next.
You need to complete the assessment successfully to be credited with this unit standard.

Acknowledgements
Careerforce thanks the people who have contributed to this workbook by:

- researching and validating content.
- providing advice and expertise.
- testing the activities.
- sharing personal experiences.
- appearing in photographs.

The images contained in these workbooks are visual illustrations only and are not representative of actual events or personal circumstances.

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