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Unit 301: Ensure Your Own Actions Reduce Risks to Health and Safety

Learning outcomes

1. Be able to identify the hazards in the workplace
2. Be able to act upon hazards in the workplace
3. Be able to reduce the risks to health and safety in the workplace

Outcome 1 assessment criteria
The learner can:
- Identify which workplace procedures are relevant to their job
- Identify those working practices in the job that could harm them or others
- Identify those aspects of the workplace that could harm them or others
- Outline any differences between workplace legislation and supplier's or manufacturer's instructions

Outcome 2 assessment criteria
The learner can:
- Report hazards to the identified responsible person
- Demonstrate the ability to deal with hazards in the workplace

Outcome 3 assessment criteria
The learner can:
- Carry out their work in accordance with workplace legislation or manufacturer's instructions
- Behave in a way that does not endanger their health and safety or that of others, or of the materials in the workplace

Diploma in Dental Nursing, Level 3, Third Edition. Carole Hollins.

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- Contribute to health and safety improvements within the workplace
- Follow guidelines for environmentally friendly working practices
- Ensure personal presentation protects their health and safety and that of others in line with instructions

This unit is assessed by:

- Observation in the workplace, with examples included in the learner's portfolio
- An appropriate alternative method

Details of various elements of theory and underpinning knowledge are included in Chapter 12, and these are assessed within the written paper.

The theory and underpinning knowledge required to understand the need to act responsibly in the workplace, to understand and follow all the health and safety policies and protocols in place, and to recognise which particular workplace activities may be hazardous to the dental team are discussed in detail in Chapters 12, 14 and 15. The actions that the dental nurse will need to take in the event of a medical emergency occurring on the premises are discussed in detail in Chapter 13.

This chapter explains the dental nurses' roles and responsibilities in relation to identifying and dealing with risks and hazards in the dental workplace. Those responsibilities are to themselves and any other person on the workplace premises. In the dental workplace, "any other person" includes patients and their guardians or escorts, visiting utility workers, such as postal workers and meter readers, and visitors such as repair and maintenance personnel.

The relevant workplace procedures that may pose a risk or hazard to the dental nurse are:

- Use of some occupational equipment and items
- Use of some hazardous occupational substances
- Moving and handling of heavy items or hazardous substances
- Disposal of hazardous substances

Overview of responsibilities

All dental workplaces, their staff and patients are covered by the provisions of the Health and Safety at Work Act (1974), as is any other workplace. In addition, other legislation is relevant to the dental workplace, due to the potentially harmful nature of the equipment and chemicals used, as well as the occupational hazards associated with delivering dental treatment or working in the dental environment.

The health and safety legislation seeks to protect staff and patients while on the premises by making staff aware of any potential hazards at work and encouraging them to find the best ways of making their particular premises safer for all concerned. In legal terms, the employer has a statutory duty to ensure that, as far as is reasonably practicable, the health, safety and welfare at work of all employees and all visitors (including patients) are protected at all times. To do this, all of the potential hazards first need to be identified, and then the likelihood of them actually causing harm to anyone must be determined. The chance that a particular workplace hazard could cause harm to someone is known as its risk, and the correct procedure to be followed by the employer (and the staff) to identify those hazards in the dental workplace that could cause harm is called a risk assessment.

Compliance with the Health and Safety at Work Act is overseen and regulated by the Health and Safety Executive (HSE). This is a government body that provides guidance to employers on the correct enforcement of the Act and investigates any serious incidents that occur in any workplace where someone suffers serious harm or is killed. Every dental workplace is required to be registered with the HSE. Compliance with the additional legislation specific to the dental workplace is also a requirement by the General Dental Council (GDC), under their *Standards for the Dental Team* documentation.

In the dental workplace, normal procedures that are carried out on a day-to-day basis include the assessment of a patient's oral health, the diagnosis of oral disease, and performing the necessary dental treatment required to cure that disease. In addition, elective dental procedures are carried out to prevent or reduce the likelihood of disease developing, and an array of administrative procedures will also be necessary to support the clinical functions of the workplace.

To ensure the safety of everyone while on the premises, both the employer and employees have responsibilities to be followed.

Employers' responsibilities

All workplaces must have a current Health and Safety Law poster on display on the premises for all staff to see (Figure 1.1). This gives the name of the employer or employing organisation and states in broad terms what employees can expect from the employer (or organisation) in relation

Health and Safety Law
What you need to know

All workers have a right to work in places where risks to their health and safety are properly controlled. Health and safety is about stopping you getting hurt at work or ill through work. Your employer is responsible for health and safety, but you must help.

What employers must do for you

1 Decide what could harm you in your job and the precautions to stop it. This is part of risk assessment.

2 In a way you can understand, explain how risks will be controlled and tell you who is responsible for this.

3 Consult and work with you and your health and safety representatives in protecting everyone from harm in the workplace.

4 Free of charge, give you the health and safety training you need to do your job.

5 Free of charge, provide you with any equipment and protective clothing you need, and ensure it is properly looked after.

6 Provide toilets, washing facilities and drinking water.

7 Provide adequate first-aid facilities.

8 Report major injuries and fatalities at work to our Incident Contact Centre on 0845 300 9923. Report other injuries, diseases and dangerous incidents online at www.hse.gov.uk.

9 Have insurance that covers you in case you get hurt at work or ill through work. Display a hard copy or electronic copy of the current insurance certificate where you can easily read it.

10 Work with any other employers or contractors sharing the workplace or providing employees (such as agency workers), so that everyone's health and safety is protected.

What you must do

1 Follow the training you have received when using any work items your employer has given you.

2 Take reasonable care of your own and other people's health and safety.

3 Co-operate with your employer on health and safety.

4 Tell someone (your employer, supervisor, or health and safety representative) if you think the work or inadequate precautions are putting anyone's health and safety at serious risk.

If there's a problem

1 If you are worried about health and safety in your workplace, talk to your employer, supervisor, or health and safety representative.

2 You can also look at our website for general information about health and safety at work.

3 If, after talking with your employer, you are still worried, you can find the address of your local enforcing authority for health and safety and the Employment Medical Advisory Service via HSE's website: www.hse.gov.uk.

Your health and safety representatives: LOUISA SHEWARD + KERRY GLYNN

Other health and safety contacts: HSE STOKE ON TRENT LYME VALE COURT, LYME DRIVE, PARKLANDS BUSINESS PARK, NEWCASTLE ROAD, TRENT VALE, SOT. ST4 6NW

Fire safety
You can get advice on fire safety from the Fire and Rescue Services or your workplace fire officer.

Employment rights
Find out more about your employment rights at www.gov.uk.

HSE
Health and Safety Executive

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Figure 1.1 A health and safety poster.

to the safeguarding of their health and safety while on the premises, as well as what employees can do themselves. It also gives contact details for the HSE in case any problem arises with regard to the employee safety.

To comply with the basic requirements of the Health and Safety at Work Act, every employer in the dental workplace must abide by the following requirements:

- Provide a working environment for employees that is safe, without risks to health, and adequate as regards facilities and arrangements for their welfare at work
- Maintain the place of work, including the means of access and exit, in a safe condition
- Provide and maintain safe equipment, appliances and systems of work
- Ensure all staff members are trained in the safe handling and storage of any dangerous or potentially harmful items or substances
- Provide such instruction, training and supervision as is necessary to ensure health and safety
- Review the health and safety performance of all staff annually, and be aware of and investigate any failures or concerns highlighted when they occur
- Display the official health and safety poster for all staff to refer to

To comply with these statutory obligations, dentists must keep their staff informed of all the safety measures adopted. Practices with five or more employees must produce a comprehensive health and safety policy and provide all staff with a copy. The policy will classify the practice's health and safety procedures and name the persons responsible. It should also list the telephone numbers of all dental, administration and equipment maintenance contractors, the local HSE contact and the emergency services.

Under the Act, all employers must therefore ensure, as far as is reasonably possible, that the health and safety of all persons on the premises is protected – and this must be achieved by carrying out a risk assessment of the workplace activities that occur on the premises. This is a specific requirement under the Management of Health and Safety at Work Regulations 1999.

Risk assessment to identify the hazards

A risk assessment is merely a detailed examination of the normal day-to-day activities that occur in the workplace in an effort to identify those that have the potential to cause harm to anyone on the premises – these are called the **hazards.** Once the hazards have been identified, a set of **precautions** can be determined that will prevent or minimise the risk associated with each hazard, thereby ensuring the safety of all those on the premises.

The aim is not necessarily to eliminate every risk completely – this is probably impossible in most workplaces, including dental surgeries – but instead to minimise those risks identified as far as possible, so that there is little chance of them causing harm to anyone.

For example, various chemicals are used in the dental workplace to carry out dental treatment successfully, including decontamination solutions, X-ray processing solutions, and mercury in amalgam fillings – all are potentially harmful, but only if they are mishandled. Knowledge of their correct storage and usage by staff, and protection from misuse by all others are key factors in avoiding a hazardous event from occurring.

The procedure for carrying out a risk assessment on a hazard, whatever its nature, should always follow the same steps:

1. **Identify the hazard** – e.g. a chemical, a piece of equipment, a procedure that occurs in the workplace
2. **Identify who may be harmed** – e.g. certain staff, certain patients, visitors, everyone
3. **Evaluate the risk** – is there a hazard only if the item in question is misused; is there a hazard with every use; or is there a hazard only if certain precautions are not followed?

4. **Control the risk** – e.g. train all staff in correct usage, improve precautions to prevent misuse, keep hazards away from untrained persons, install health monitoring where appropriate, remove the risk where possible
5. **Record the risk assessment findings** – this is done to prove compliance, to provide a reference for all users, to ensure all staff are fully informed of the potential hazards in the dental workplace
6. **Review the assessment process** – do this on a regular basis to ensure that hazardous events or injuries do not occur

Recording the findings of the risk assessment is considered "best practice" for all workplaces, and is a legal requirement for all employers with five or more employees. As any relevant laws and regulations are updated, areas of the risk assessment may then need to be reconsidered and updated too.

Employees' responsibilities – role of the dental nurse

All employees are legally required to take reasonable care for their own and others' health and safety, and to cooperate with their employer to this effect while carrying out their normal workplace activities. Indeed, it is an offence for an employee to intentionally break the workplace rules and policies in relation to health and safety, whether or not this causes harm to themselves or others.

All dental nurses have a legal obligation to co-operate with their employers in carrying out the practice requirements in respect of these safety measures. They are designed to protect not only the staff and patients, but also anyone else using or visiting the premises. In a large dental workplace, a dental nurse may be appointed as the safety representative under the Act for the purpose of improving liaison within the practice about health and safety matters.

Many dental nurses begin their careers as young trainees in the dental environment, so the following two sets of regulations are specifically important in protecting their welfare too:

- Health and Safety (Young Persons) Regulations 1997
- Management of Health and Safety at Work Regulations 1999

These sets of regulations dictate that a risk assessment of the dental environment has to be carried out with particular regard to the protection of younger staff members, by taking into account the following points:

- The risks to young people before they start work
- The psychological or physical immaturity and inexperience of young people
- Their lack of awareness of existing or potential risks to their health and safety
- The fitting and layout of the workplace and surgery areas, with regard to the safety of young people
- The nature, degree and duration of any exposure to biological, chemical or physical agents in the work environment
- The form, range, use and handling of dental equipment
- The way in which processes and activities are organised
- Any health and safety training given, or intended to be given

A typical risk assessment summary of the types of work activities that a young dental nurse is likely to carry out in the workplace is shown in the following table. The second column identifies

all of the possible hazards that the dental nurse may be exposed to when carrying out each particular activity, and the third column shows the precautions that must be taken to ensure that the hazards are reduced as far as possible.

Work activity	Potential risk	Prevention with controls
Chairside assisting	Eye injury from projectiles during treatment Inhalation of aerosols during treatment	Explanation of risks, training in activities undertaken, initial supervision Provision and use of all personal protective equipment (PPE)
Instrument decontamination	Inoculation injury (clean or dirty) Contamination splash during cleaning	Explanation of risks, training in cleaning methods, initial supervision Additional PPE – plastic apron and thick rubber gloves
Use of autoclave	Burns from hot machine or instruments Scalds from steam	Explanation of risks, training in handling methods, initial supervision
Exposure to hazardous chemicals	Inhalation of vapours, skin contact, eye contact	Explanation of risks, training in handling methods, initial supervision Provision and use of full PPE Adequate ventilation
Use of X-rays	Accidental exposure to X-rays	Explanation of risks, inform of designated control area, avoid unauthorised entry to area

Without exception, the reduction of risk for each activity relies on suitable induction training being given, where dental nurses are made aware of the hazards they face and are then trained how to carry out each activity safely. They will then be supervised by a more senior colleague until they can carry out the activity correctly and without putting themselves or others at risk. This supervision also forms the basis of the observation and assessment criteria "sign-off" that is carried out by the assessor during the Level 3 Diploma qualification, where student dental nurses are formally observed during their training and gradually build up their portfolio of evidence.

There are also everyday activities and events in the dental workplace that may present a hazard to people on the premises and that are not exclusive to the dental workplace but may occur anywhere. The risk assessment process must consider them as well, rather than focusing solely on the particular hazards of the dental workplace, and must then produce a list of methods to avoid or control them too. Obvious examples of these commonplace events and the sensible actions to take to avoid them are shown in the following table, but the list is not exhaustive and will vary greatly between dental workplaces.

Scenario of potential hazard	Common-sense actions to avoid harm
Injury sustained by falling down on the premises	Keep all access routes clear of debris and blockages Maintain floor covering adequately Avoid cleaning during work time Clear all spillages immediately Use hazard signs to highlight potential sources of injury (Figure 1.2)

Scenario of potential hazard	Common-sense actions to avoid harm
Child drinking harmful chemical	Keep harmful chemicals out of reach Keep chemicals in locked storage area Keep children out of storage area Keep children under control at all times
Person falling out of window on premises	Install window locks Install restricted opening device Keep staff-only areas locked
Injury sustained from slammed door	Keep doors locked when rooms are not in use Install slow-closure devices to prevent slamming Install safety glass

Figure 1.2 Hazard sign indicating a wet floor.

If the simple common-sense actions have not been carried out initially, then the employer is to blame if someone is harmed as a direct result of these failings. If, however, a risk assessment has resulted in the necessary preventative measures being put into place, and someone else has flouted them – such as by leaving a door or cupboard unlocked to avoid the inconvenience of having to keep unlocking it – then that person is to blame instead.

Dental nurses will be required to carry out the following tasks within their own workplace, and provide evidence to their assessor of having done so in their workplace portfolio:

- Identify the workplace procedures that are relevant to their role as a dental nurse
- Identify the working practices in their role as a dental nurse that may cause harm to themselves or others (these are shown in the preceding table)

- Identify the aspects of their particular workplace that may cause harm to themselves or others (these will vary between workplaces)
- Outline any differences between workplace legislation and suppliers'/manufacturers' instructions

All members of staff have a legal obligation under the Health and Safety at Work Act to co-operate with their employer by following the policies and procedures put in place to protect all persons while on the premises. They must also take reasonable care for their own and others' health and safety while on the premises. Failure to do so, as indicated earlier, will result in their possible investigation and prosecution by the HSE and a "fitness to practise" hearing with the GDC, for those who are registrants.

The level of reasonable care expected to be taken for their own health and safety as employees (and in line with fitness to practise requirements by the GDC) requires dental nurses to abide by the following when in the dental workplace:

- Undergo suitable training in the use of dental materials and equipment items
- Always follow that training when using those materials and equipment items
- Always follow all policies in relation to health, safety and welfare issues
- Never misuse any materials or equipment on the premises
- In particular, never misuse or fail to use any materials or equipment that are specifically meant to reduce or eliminate hazardous risks
- Always report any faults in procedures or equipment to a senior colleague immediately
- Never enter certain designated "hazardous" areas unless authorised to do so
- Always report any suspected health problem that will impact on their normal work to a senior colleague as soon as possible

Personal presentation

In the dental workplace the emphasis is often very much on the avoidance of cross-infection from patients to staff, especially by following "standard precautions" in relation to infection control (see Chapters 4 and 12). However, patients may also be at risk of cross-infection from staff members if the latter's basic personal hygiene is inadequate or if they fail to apply the relevant health and safety actions when dealing with patients.

Consequently, a certain standard of personal presentation is required of the dental nurse when in the workplace, under the following three areas:

- Personal hygiene
- Use of PPE
- Suitable clothing and accessories when in the workplace

Personal hygiene

A good standard of personal hygiene by any healthcare worker could be considered to be a professional obligation by some, and the dental nurse working in close proximity to patients on a daily basis is no exception. It is therefore reasonable for patients to expect the following standards from dental nurses:

- Body washed to avoid odours, and the sensible use of anti-perspirant/deodorants
- Clean hair, with long hair tied back while working so that it does not fall across the face or onto any surrounding items
- Clean hands and nails, with no nail varnish or false nails present and hands washed to a clinical/hygienic standard when working at the chairside (see later)
- Clean and well-restored teeth, and the sensible use of oral health products
- Sensible use of any facial make-up

- Minimal evidence of any facial piercings or tattoos – some employers may request the removal of various facial jewellery if they are considered to be a health and safety issue, and tattoos may have to be kept covered if they may cause offence

Hand washing is the most important method of preventing cross-infection, and the technique used should be that stipulated by the Health and Safety Council. The three recognised levels of hand hygiene are as follows:

- **Social** – to become physically clean from socially acquired microorganisms, using general purpose liquid soap
- **Clinical/hygienic** – to destroy microorganisms, maintain cleanliness and avoid direct cross-infection, using an approved antibacterial hand cleanser
- **Surgical** – to significantly reduce the numbers of normally resident microorganisms on the hands, before an invasive surgical procedure is carried out, using an approved antibacterial hand cleanser

Generally, hand hygiene of a socially acceptable standard is adequate, but when working at the chairside the dental nurse will need to achieve a clinical standard of hand hygiene instead. The correct procedure for **hygienic hand washing** should be displayed in poster form at each dedicated hand washing sink in the workplace, and the instructions are as follows (Figure 1.3):

- Turn on the tap using the foot or elbow control, to prevent contamination of the tap
- Wet both hands under running water of a suitable temperature
- Apply a suitable antibacterial liquid soap from the specially operated dispenser and wash all areas of both hands and wrists thoroughly – this should take up to 30 seconds to carry out correctly
- Nail brushes are not advised unless they are autoclavable, as they can become contaminated with repeated use
- Rinse both hands under running water, holding them up so that the water does not flow back over the fingers
- Dry the hands thoroughly, using single-use disposable paper towels
- Heavy-duty gloves must be worn whenever the cleaning of dirty instruments is being carried out
- Clinical gloves must be worn whenever patients are being treated, and discarded between patients – these should be non-powdered and of a non-latex material, such as nitrile or vinyl, to avoid the development of skin sensitisation conditions

Use of PPE

This is worn to prevent staff from coming into contact with blood and other bodily fluids, and its correct use should be stipulated in the infection control policy. If the dental nurse has any wounds present on the hands or fingers, they should be covered with waterproof dressings beneath the PPE. It is a legal requirement for dental employers to provide the following protective clothing for their staff:

- **Gloves** of varying quality (clinical or household)
- High-temperature-washed **uniform**, to be worn in the work area only
- **Plastic apron** to be worn over the uniform when soiling may occur during surgical procedures or while cleaning the surgery
- **Safety glasses** or goggles, to prevent contaminated material from entering the eyes
- Prescription glasses should be further protected by wearing a **visor** or face shield
- Visors or face shields alone do not provide adequate protection to the eyes, or prevent the inhalation of aerosol contaminants without the use of a **face mask** too

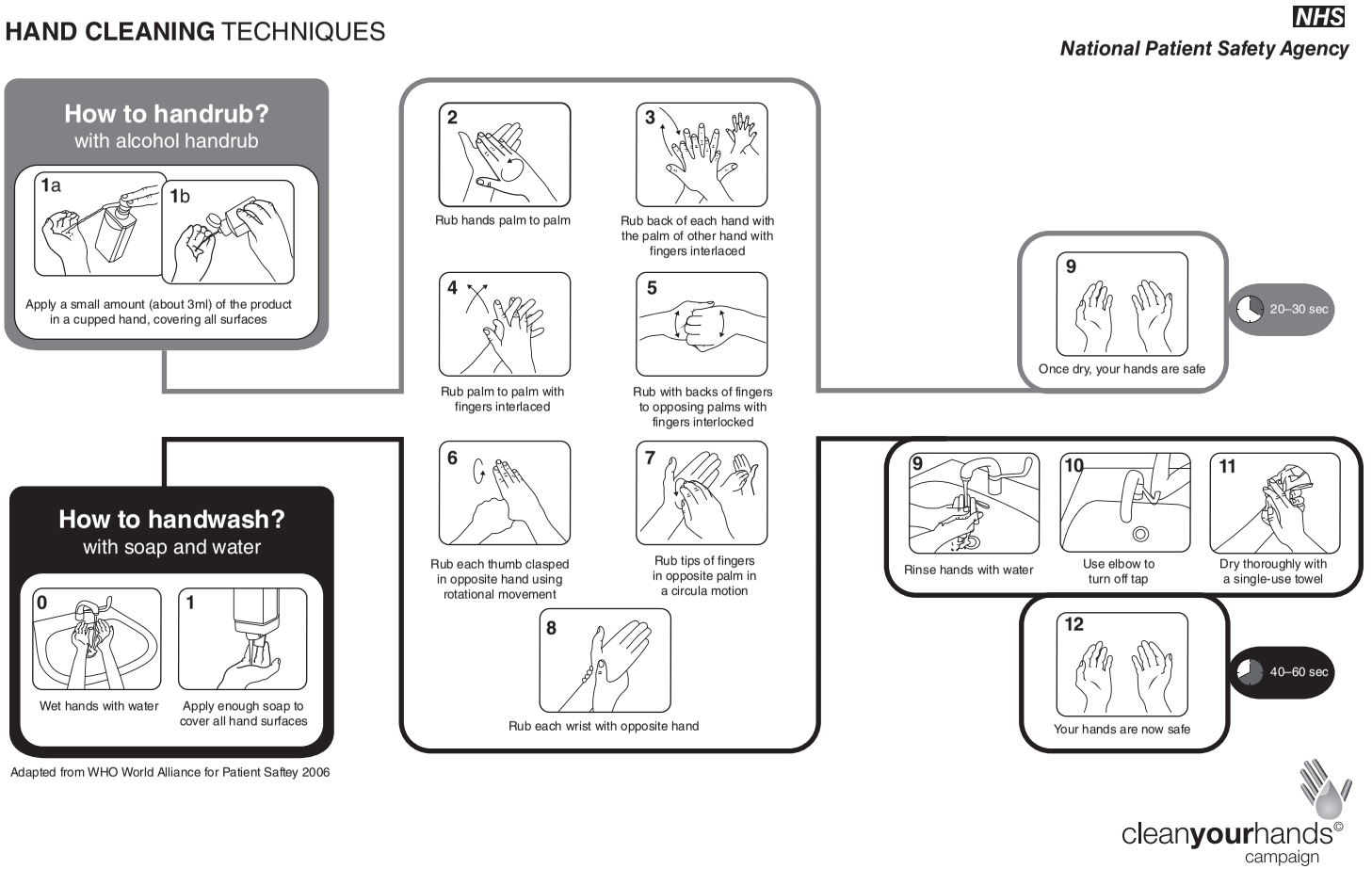


Figure 1.3 A hand washing poster.

- **Face masks** of surgical quality should be worn whenever dental hand pieces or ultrasonic equipment are in use, to prevent the inhalation of aerosol contamination and pieces of flying debris

Alcohol-based hand gels should not be used with clinical gloves, as they can damage the nitrile or vinyl material, allowing leakage to occur. Household gloves can be safely washed with detergent and hot water, and then left to dry naturally.

Suitable clothing and accessories

When working at the chairside, dental nurses must wear the uniform provided by their employer. This can then be removed before leaving the workplace so that contaminants from the surgery area are not transferred into the wider community. Suitable footwear is provided by some employers, too, and is usually a style of surgical clog which provides adequate coverage and protection of the toes. Alternatively, personal footwear is worn and must be flat or minimally heeled and also provide full coverage of the toes. Ideally the shoes worn should not have a patterned surface or a lace-up design, so that they can be cleaned more easily if they become contaminated by spillages and so on.

If dental nurses are carrying out administrative duties rather than clinical duties, some employers may allow their attendance without a uniform, so their attire should be smart and sensible. In particular, denims and T-shirts bearing logos should be avoided in these instances, as should party-style or casual clothing and footwear. The dental nurse should always give the impression of being a professional member of staff when working in the dental workplace.

Any jewellery worn should be discreet – dangling earrings or necklaces must be removed during work time. To reduce the risk of cross-infection, it is ideal for all rings, bracelets and watches to be removed when the dental nurse is working at the chairside, but this is not necessary when only performing administrative duties.

Summary of health and safety requirements

Full compliance with health and safety legislation for all dental workplaces, be that is a practice, a clinic or a hospital department, involves all of the following:

- Fire Precaution (Workplace) Regulations (1999)
- Health and Safety (First Aid) Regulations (1981) – see Chapter 3 for full details
- COSHH – Control of Substances Hazardous to Health (1994)
- RIDDOR – Reporting of Injuries, Diseases and Dangerous Occurrences (1995)
- Environmental Protection Act (1990)
- Special Waste and Hazardous Waste Regulations (2005)
- Ionising radiation legislation (IRR 99 and IR(ME)R 2000) – see Chapter 7 for full details
- Occupational hazards – inoculation injury
- General safety measures – moving and handling

Dental nurses must understand and demonstrate how each area of legislation and regulation impacts on them and their daily duties in the dental workplace.

Fire Precaution (Workplace) Regulations

These became law in 2006 and state the following:

- Employer/owner of the premises must take reasonable steps to:
  - Reduce the risk of fire
  - Ensure adequate means of safe escape from a fire
- They must therefore risk assess their premises to determine the fire precautions required

The fire precautions required will vary from one workplace to another; for example, a ground floor practice will be considered less dangerous to staff and patients in the event of a fire than one that is in a multi-storey building.

A typical fire risk assessment should consider the following points, in the order shown:

1. **Identify the fire hazards on the premises** – these will include flammable materials (liquids, vapours, textiles, paper products), heating appliances with naked flames, electrical equipment, static sparks from electrical equipment, flammable sedation gases, flammable rubbish
2. **Identify who may be harmed** – consider anyone on the premises, paying special attention to children and vulnerable adults who may be attending, and where they may be on the premises
3. **Evaluate the risk of a fire occurring** – consider the amount of various flammable materials on the premises, and where they are used or stored, the number of heating appliances and items of electrical equipment, any sedation gases, the amount of flammable rubbish at any time
4. **Control the risk by taking precautions** – reduce the amount of flammable materials used where possible, and ensure they are stored away from heat sources; replace naked flame heat sources with safer alternatives (the only likely exception will be portable burners used for denture work); ensure electrical appliances are properly serviced and maintained; use and store sedation gas cylinders away from heat sources; avoid storing flammable waste near heat sources; consider whether or not current fire detection methods, firefighting equipment and evacuation procedures are adequate
5. **Record the risk assessment findings** – in particular, record all findings and details of the actions taken to improve precautions; ensure all staff are notified of the findings and any new actions to be followed
6. **Review the risk assessment periodically** – annually is adequate, recording the date of the review and whether or not any revisions were made

All dental workplaces then undergo a fire safety inspection, so that the premises can be formally recorded as having carried out the necessary risk assessment. Although several companies provide the means for this to be carried out by post, a visit by a suitably qualified inspector from the Fire Service will hold more weight if a fire does occur, and the practice is held to account for its level of compliance.

The inspection will give advice with regard to the following:

- The number and positioning of smoke detectors
- The number and positioning of fire extinguishers
- Written records of staff training in the use of fire extinguishers
- The types of fire extinguishers to be provided, with at least two types present in all workplaces
- The presence of any obvious fire risks that must be removed, such as the use of open-flame gas heaters to warm a room

Fire detection

Fires are detected by some type of alarm system, operated either manually by an individual when a fire has been discovered or automatically by smoke or heat detection. The larger the workplace premises, the more sophisticated the detection system tends to be. The types of premises that require an electrical fire alarm system and/or an automatic detection system are large workplaces, perhaps over several levels, where a fire breaking out in one area could go undetected by an ordinary smoke alarm or unnoticed by a person for some time. Hospital departments and health clinics are likely examples where these additional fire detection methods would be required.

In smaller workplaces (the majority of dental practices), a fire risk assessment should determine that adequate fire detection is provided by the use of strategically placed, battery-operated smoke alarms around the premises (Figure 1.4). These should be tested on a regular basis to ensure they are functioning correctly, and a record kept of these test dates and results. Obviously the battery should be changed as soon as it begins to fail, or the alarm changed if any malfunctions occur.

Figure 1.4 A smoke alarm.

Figure 1.5 A fire extinguisher.

Firefighting

The main equipment available for use in firefighting is the fire extinguisher (Figure 1.5), although some premises will have additional equipment such as fire blankets, water sprinklers and hoses. To decide what firefighting equipment should be available, the classification of fires is considered to determine which products are the most likely to pose a fire risk in the workplace:

- **Class A fire** – caused by the ignition of carbon-containing items, such as paper, wood and textiles
- **Class B fire** – caused by flammable liquids, such as oils, solvents and petrol
- **Class C fire** – caused by flammable gases, such as domestic gas, butane, liquefied petroleum gas (LPG)
- **Class D fire** – caused by reactive metals that oxidise in air, such as sodium and magnesium
- **Class E fire** – caused by electrical components and equipment
- **Class F fire** – caused by liquid fats, such as used in kitchens and restaurants

In the dental workplace, the likeliest causes of fire suggest that extinguishers to fight classes A, B, C and E should be available. The content of each fire extinguisher varies depending on its recommended use, and is identifiable by a coloured label or specific wording on the label of the extinguisher. All extinguishers are coloured red so that they are easily visible, while the label and its wording describe the fire classification it is suitable for, as follows:

- Red (water) extinguisher – for use on all except electrical fires
- Black (carbon dioxide) extinguisher – for use on all fires
- Blue (dry powder) extinguisher – for use on all fires

The extinguishers must all be inspected and certificated by a competent person on an annual basis, and replaced as necessary. The dental nurse will receive induction training with regard to the health and safety in the workplace, and this should include the location of all firefighting equipment and instruction in its use. The extinguishers should be located:

- Within easy reach, ideally along escape routes
- Placed in conspicuous positions (e.g. not hidden by surrounding cupboards)
- On wall mountings and signposted
- In a similar position on each level of the premises

Evacuation and escape routes

During the risk assessment process, consideration will be given to whether, in the event of a fire, all persons on the premises could leave safely and reach a place of safety. There should be no possibility of anyone being cut off from escaping from the premises by either smoke or flames.

In particular, the following areas of fire safety must be complied with:

- Escape routes must be kept free from all obstructions to allow immediate evacuation from the premises if necessary – in particular, key-operated outer doors must be kept **unlocked** during normal working hours
- In large dental workplaces such as a hospital, security is maintained during normal working hours by having fire exits that cannot be opened from the outside of the building but can be opened from inside the premises by activating an alarmed "lift bar" device
- Fire exits must lead directly to a place of safety, usually outside the building itself
- They must be clearly marked by green "fire exit" signs, with an accompanying pictogram of a running man (Figure 1.6)
- Emergency lighting should be provided if necessary – this applies to hospitals rather than smaller workplaces, and their need will have been identified during the fire risk assessment
- Emergency doors should open manually in the direction of escape and should **not** be operated electrically
- Sliding or revolving doors should **not** be used as fire exits
- All staff must be aware of the fire safety and evacuation process, and the procedure for evacuation should be practised at least annually
- In addition, some staff should be charged with certain actions during the evacuation procedure, such as checking certain areas are clear, or closing certain doors to contain the fire
- Special consideration also needs to be given to the needs of disabled persons, and in small workplaces they should only be treated in ground floor surgeries so that they can be easily evacuated from the premises

The culmination of the findings from the fire risk assessment will ultimately be the development of a written fire policy, or an emergency plan. This is a legal requirement in workplaces with more than five employees and it must be available to all employees and to the fire inspector. It should detail what action everyone on the premises should take in the event of a fire, and may be covered by a simple "fire action" poster displayed in the reception area (Figure 1.7).

Figure 1.6 A fire exit pictogram.

Figure 1.7 A fire action poster.

Larger dental workplaces (hospitals, clinics and large multi-surgery premises) will be expected to provide more detail still, and a suitable emergency plan should cover the following points:

- Action to take in the event of a fire
- Alarm warnings (klaxon, whistle, bell, etc.)
- How to call the rescue services
- Evacuation arrangements, including details for disabled persons
- Assembly point
- Method of accounting for all persons (e.g. use of the day list)
- Key escape routes
- Location and use of firefighting equipment
- Responsibilities of nominated persons
- Power shutdown methods
- Staff training

Whatever the size and layout of the particular dental workplace, the dental nurse must be fully aware of the following:

- The fire alarm system in use on the premises and when a test drill is being carried out
- The location of all firefighting equipment and its correct use
- The escape routes available and the assembly point(s)
- How to open any fire exits along the escape route taken
- The method to be used to account for all persons on the premises

Smoking in the workplace

Smoking in all enclosed workplaces is now prohibited throughout the UK. All enclosed workplaces, which include all types of dental workplace, must display a "no smoking" sign at each entrance to the premises, and they must contain the following wording: "No smoking. It is against the law to smoke in these premises."

Before the ban, careless disposal of cigarettes was a significant cause of fires in the workplace. As a member of staff, the dental nurse must abide by this ban and actively assist the employer in enforcing it, by reporting all breaches to a senior colleague, whether another staff member or any other individual is involved.

First aid regulations

In the dental workplace, a health and safety policy will have been developed after a risk assessment has been carried out for the premises, usually by the employer. The dental nurse must follow this policy when on the premises at all times, as should all other personnel, to avoid the potential for accidents to occur.

Specifically, dental nurses must ensure they are not responsible for any acts or omissions in relation to the health and safety policy that would put themselves, their colleagues or any other individuals in the workplace at risk of harm, at any time. Obvious examples of poor practice would be a failure to follow ionising radiation regulations, failure to wash their hands and wear PPE when dealing with patients, or failure to take adequate precautions when using cleaning chemicals.

Dental nurses must therefore ensure that they are familiar with the following:

- Where the health and safety policy is kept
- Its contents
- The details of any updates or amendments to the policy
- The changes required in their actions following the updates or amendments

When dental nurses are called upon to act as emergency first aiders away from the dental workplace (such as coming upon the scene of a car crash), the knowledge and skills they have in relation to health and safety must be adapted accordingly. They must use their common sense in the emergency situation to ensure that no one else is put at risk while attempting to help any casualties.

Knowledge and use of emergency equipment

All dental workplaces should have first aid provision available for their employees, in the form of a first aid box (Figure 1.8) that is in an easily accessible position and highlighted with a typical poster showing a white cross on a green background (Figure 1.9).

In a workplace of five or more employees, at least one person should be trained as an emergency first aider, although having as many trained staff as possible is ideal so that holiday periods and sick leave are covered too. The contents of the first aid box will have been chosen in light of the risk assessment carried out on the premises, and should include all of the following items in the dental workplace as a minimum:

- Emergency first aid booklet – as a quick reference guide
- Assorted waterproof plasters
- Eye pads
- Assorted medium and large dressings, with scissors
- Triangular bandage and safety pins to secure once applied
- Sealed cleansing wipe packets
- Face shield for non-contact mouth-to-mouth resuscitation
- Burn shield
- Finger dressings
- Space blanket to maintain body temperature
- "Micropore" tape
- Non-latex clinical gloves

Suitable first aid training will cover the use of each item. When the dental nurse has received training it is advisable to maintain a similar first aid box for personal use away from the dental workplace; it could be stored in the car, for example. Some of the items will have "use by" dates,

Figure 1.8 A first aid box.

Figure 1.9 A first aid box location poster.

and there must be a simple process in place to ensure that they are checked on a regular basis so that items can be replaced as necessary. This should be a duty of the first aider and must be delegated within the workplace accordingly.

In addition to the first aid kit, the dental workplace must also have certain specialist resuscitation equipment available on the premises and in good working order, and all personnel must be regularly trained in its use. The management of medical emergencies is a verifiable continuing professional development requirement for all staff in the dental workplace. Medical emergencies and their management are discussed in detail in Chapter 13.

Control of Substances Hazardous to Health (COSHH)

Many of the chemicals and other hazardous substances used in the dental workplace on a day-to-day basis can be harmful to a person's health if they are misused or if adequate precautions are not taken to prevent access by unauthorised persons. However, without these substances, the business of dentistry could not be carried out, so the continued use of the chemicals under safe conditions is the desired outcome.

Again, the determination of the level of risk from any of the chemicals or substances involved, those who may be harmed and the necessary precautions to take are all determined by carrying out a risk assessment.

The risk assessment process to be followed in this case is determined by the COSHH regulations, which require all dental workplaces to carry out a risk assessment of all the chemicals and potentially hazardous substances used on the premises, to identify those that could harm or injure staff members. Hazardous substances include any that have been labelled as **dangerous** by the manufacturer, and these are easily recognised by the use of a universal system of symbols indicating the specific hazard of the substance (Figure 1.10) – they may be classed as "toxic", "harmful", "corrosive", "irritant", and so on.

Harm may be caused if an accident occurs to expose personnel to an unusually large amount of a chemical, or if a chemical accidentally gains entry to the body (e.g. by being inhaled), or merely just by the dangerous nature of even small amounts of a chemical (e.g. mercury).

The risk assessment process follows the usual steps (as detailed previously), but the written report produced must include every potential chemical hazard found and the following specific information:

- The hazardous ingredient(s) it contains
- The nature of the risk, ideally by indicating the risk category using recognised symbols
- The possible health effects of the hazardous ingredient(s)
- The precautions required for the safe handling of the product
- Any additional hazard control methods required for its safe use
- All necessary first aid measures required in the event of an accident involving the product

The reports are then kept in a COSHH file for quick reference as necessary, and updated regularly. They should be available to the whole dental team for reference, and all staff members should sign to say they have read and understood the information. An example of a COSHH assessment sheet is shown in Figure 1.11.

The risk assessment follows the usual steps, with pertinent points to be determined as detailed in the following for each substance used in the dental practice – ranging from specific dental materials through to general cleaning agents:

- **Identify those substances that are hazardous** – by reading the manufacturer's leaflets and instruction sheets enclosed with the product, or shown on the label
- **Identify who may be harmed** – this is likely to be anyone who uses the substance, although potential public access must be taken into consideration too

Know your hazardous chemical products. Below are the four health categories:

TOXIC
– can cause damage to health at low levels
for example, mercury is toxic by inhalation

HARMFUL
– can cause damage to health
for example, some disinfectants /tray adhesives are harmful by inhalation

CORROSIVE
– may destroy living tissue on contact
for example, phosphoric acid (etchant) causes burns in contact with skin

IRRITANT
– may cause inflammation to skin and/or eyes, nose and throat
for example, some disinfectants and x-ray developer can irritate the eyes and skin

Note:
For packaged hazardous chemical products, the label (depending on the size) should contain a symbol (as above) and simple information about the hazard and the precautions required. The Safety Data Sheet will provide more detailed information and the supplier is obliged to provide this if the substance is hazardous to health and is used at work.

Figure 1.10 Symbols of Control of Substances Hazardous to Health (COSHH) risk categories. Source: *Levison's Textbook for Dental Nurses*, 11th edition (Hollins), 2013. Reproduced with permission of Wiley-Blackwell.

- **Identify how they may be harmed** – e.g. is the product hazardous on skin contact, or by inhaling fumes, or an eye irritant?
- **Evaluate the risk** – is the substance only harmful if misused or is it harmful with every use?
- **Determine whether health monitoring is required** – e.g. during exposure to mercury or nitrous oxide gas used in inhalation sedation as a conscious sedation technique
- **Control the risk** – by ensuring the substance is not misused, by providing suitable PPE, or reduce the risk as far as possible if it is harmful with every use; this may involve changing the product if the potential risk is considered too great
- **Inform all staff of the risks** – by staff meetings, and introduction of the COSHH sheets to be read and signed by all team members
- **Record the risk assessment** – keep documented evidence that the assessment has been carried out, with review and update dates recorded as necessary

While the dental nurse is an integral part of the risk assessment procedure as a member of staff, more senior dental nurses may take over the role of maintaining the COSHH files and updating them as necessary, once suitable and documented training has been given. However, all student dental nurses must receive health and safety information covering these issues as part of their induction training with their employer.

Some general safety points with regard to hazardous substances likely to be found in the dental workplace are given in the following sections.

Name of Substance							
Hazardous Ingredients							
Used for							
By whom							
Frequency							
Amount							
Nature of Risks	Chemical		Flammable		Poisonous		Biological
Exposure Limits	OES (MEL if applicable)			ppm		mg m^{-3}	
	Long term (8 hr TWA)			–			
				–			
Other							
Health Effects							
Eye contact							
Skin contact							
Inhalation							
Ingestion							
Precautions for Safe Handling and Use							
Spillage							
Waste disposal							
Storage							
Control Measures							
Ventilation							
Eye protection							
Respiratory protection							
Gloves							
Health monitoring							
Staff training							
Other							
First Aid Measures							
Eye contact							
Skin contact							
Inhalation							
Ingestion							

Dentists and staff members to sign to confirm these Control Measures are carried out:

1 ..... **4** ..... **7** .....
2 ..... **5** ..... **8** .....
3 ..... **6** ..... **9** .....

Figure 1.11 Example of a Control of Substances Hazardous to Health (COSHH) assessment sheet. Source: *Levison's Textbook for Dental Nurses*, 11th edition (Hollins), 2013. Reproduced with permission of Wiley-Blackwell.

Storage

All chemicals should be stored in the dental workplace as follows:

- In cupboards/rooms away from public access, or in locked cupboards/rooms in areas of public access
- In separate fire-resistant locked storage facilities for inflammable substances and poisons
- At the ideal storage temperature as indicated by the manufacturer's instructions (this is usually room temperature of 20°C or less)
- Mercury must be stored in a cool cupboard in properly sealed containers
- Oxygen and nitrous oxide cylinders should ideally be stored outdoors, but if this is not possible, a well-ventilated fire-resistant storage area should be used
- Larger cylinders should be secured in an upright position so that they cannot fall over and be punctured or harm someone
- An appropriate trolley should be available for moving heavy cylinders

Exceptions to these storage requirements are emergency oxygen cylinders, which must remain in easy access locations throughout the dental workplace at all times.

Ventilation and temperature control

Suitable ventilation in the dental workplace can be achieved simply by having windows open, or by the use of extractor fans that are positioned so that they do not exhaust directly onto any passers-by. Air conditioning units may also be installed, but the correct location of their vents and adequate system maintenance are crucial to prevent the risk of passers-by contracting Legionnaires' disease. Units that use recycled air are not recommended for the dental workplace, as they will allow airborne contamination to cross-infect other persons.

Where nitrous oxide gas is used during inhalation sedation sessions, the waste gas must be removed by a suitable scavenging system to prevent the build-up of harmful levels of the gas in the surgery.

In summary, then, adequate ventilation is essential to prevent the accumulation of hazardous vapours and gases, and in this way to minimise any risk of harm from them. This is particularly relevant to dangerous or irritant vapours from mercury, some disinfectants, nitrous oxide and some laboratory chemicals.

The temperature within the dental workplace is usually maintained by the central heating system in cooler months and by adequate ventilation throughout the summer. While the minimum working temperature should be no less than 16°C, there is no maximum temperature above which work should stop.

However, higher temperatures usually allow for a greater volume of vapours, gases and fumes to develop, so in warmer periods the ideal is to maintain a temperature of around 20°C – "room temperature".

Occupational hazardous chemicals

In the dental workplace, there are three hazardous substances used on a daily basis by most staff that require special mention in relation to COSHH:

- Mercury
- Acid etchant
- Bleach (and other disinfectants)

Mercury

Mercury is a liquid metal that is mixed with various metal powders to form dental amalgam – a material used to fill teeth. Mercury is classed as a hazardous substance because it is toxic and it can enter the body in the following ways:

- **Inhalation** – toxic vapours are released from uncovered sources at room temperature and above, and are particularly hazardous because they are colourless and odourless and therefore difficult to detect
- **Absorption** – particles can be absorbed through the skin, nail beds and eye membranes, and eventually become lodged in the kidneys
- **Ingestion** – particles can contaminate foodstuffs and drinks, and be taken into the digestive system and eventually lodge in the kidneys

Dental amalgam is still the commonest material used to fill teeth, so mercury is present in significant amounts in the majority of dental workplaces. Exposure to the hazards mercury poses cannot easily be avoided, but the risks can be minimised by following simple rules designed to limit the chances of staff contact.

Inhalation

- Ensure that the workplace is adequately ventilated and kept at a reasonable working temperature, so that fumes do not build up
- Avoid placing mercury and waste amalgam near heat sources (including sunny windowsills), as more fumes are given off at higher temperatures
- Use pre-loaded amalgam capsules (Figure 1.12) so that bottles of mercury do not have to be stored on the premises
- Store all waste amalgam in special sealed tubs containing a mercury absorption chemical (Figure 1.13)
- Similarly, used amalgam capsules must be stored in special sealed tubs, as it is likely that tiny amounts of mercury will remain in them after use (Figure 1.14)
- Ensure every trace of amalgam is removed from instruments before they are sterilised in the autoclave, otherwise fumes will be released as the autoclave heats up
- If a mercury spillage occurs, wear appropriate PPE, including a face mask, to avoid inhalation

Absorption

- Always wear the correct PPE when handling amalgam capsules and waste amalgam, to avoid skin, nail and eye contact
- Open-toed shoes must not be worn in the surgery area, to avoid absorption through the feet if any amalgam or mercury is spilled

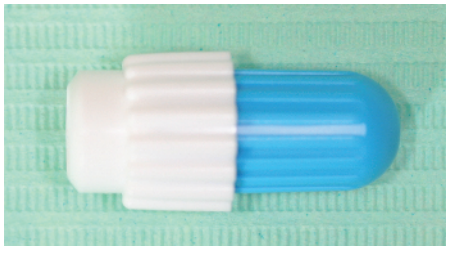


Figure 1.12 A pre-loaded amalgam capsule.

Figure 1.13 A waste amalgam tub.

Figure 1.14 A tub for waste amalgam capsules.

- Always wear safety goggles or a face visor when old amalgam fillings are being removed, so that stray specks do not enter the eyes
- If a mercury spillage occurs, wear gloves and safety goggles to avoid skin or eye contact

Ingestion

- Food and drink must never be consumed in the surgery area
- Stocks of mercury and amalgam capsules must not be stored within the staff bathroom
- Waste amalgam containers must not be stored within the staff rest room

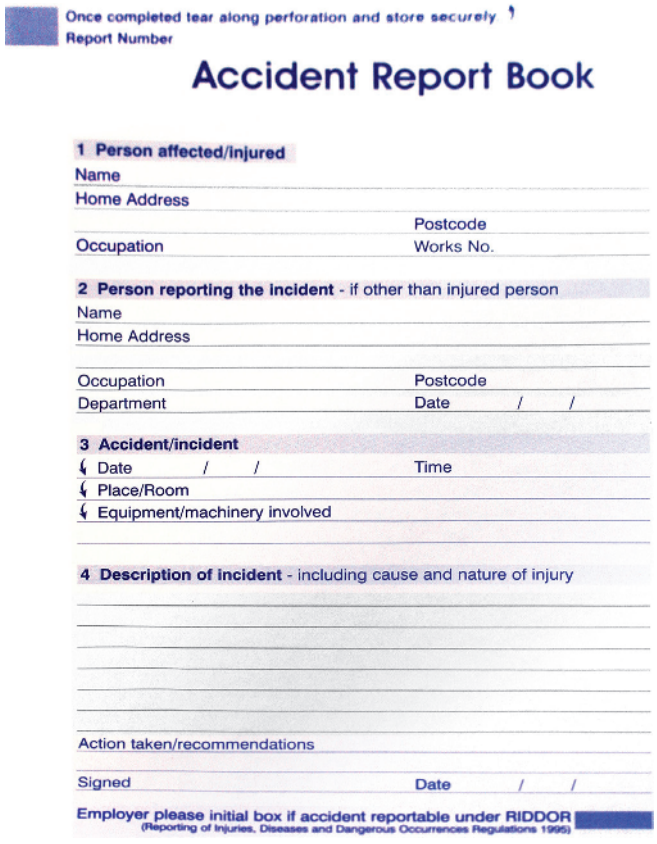
Handling of mercury spillages

The use of capsulated amalgam products will limit the likelihood of a large mercury spillage, but the capsules themselves can rupture during use, releasing liquid mercury into the environment, although on a much smaller scale.

All spillages of mercury, no matter how small, must be reported to the responsible person and recorded in the workplace "accident book" (Figure 1.15). The responsible person will vary between dental workplaces and may be a senior dental colleague, a line manager or supervisor, a hospital section leader or a designated health and safety person. Dental nurses will be required to be able to identify the responsible person in their own workplace.

The accident book entry will provide a written record of any accident or incident that has occurred on the premises, and which could have potentially harmed someone. It must include details of the following:

- The date and location of the accident/incident
- Who was affected
- The names of any witnesses



Once completed tear along perforation and store securely

Report Number

Accident Report Book

1 Person affected/injured

Name

Home Address

Postcode

Occupation Works No.

2 Person reporting the incident - if other than injured person

Name

Home Address

Occupation Postcode

Department Date / /

3 Accident/incident

Date / / Time

Place/Room

Equipment/machinery involved

4 Description of incident - including cause and nature of injury

Action taken/recommendations

Signed Date / /

Employer please initial box if accident reportable under RIDDOR

(Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995)

Figure 1.15 A page of an accident book.

- Details of the accident/incident
- Actions taken to assist those affected

In the unfortunate event of any long-term health effects, this report will provide valuable evidence about whether correct procedures were followed, and whether the accident/incident was unavoidable or not.

If mercury is spilled, it tends to form into liquid globules or small balls. In this shape, the liquid can easily roll around and be difficult to pick up; indeed larger globules often break into smaller ones when attempts are made to handle them. The correct actions to take after a mercury spillage are therefore very important, to prevent further contamination and spread into the workplace environment.

If there is a **small spillage**:

- Wear suitable PPE
- Suck up small globules into a disposable plastic syringe or a dedicated bulb aspirator (Figures 1.16 and 1.17)
- Put the particles into the waste amalgam special waste container
- Never use the dental suction unit, or the vacuum cleaner, to suck up spilt mercury – their use will release toxic mercury vapours into the workplace
- Alternatively, the lead foils present in intra-oral X-ray film packets can be used to gather the globules together and scoop them up, but the use of a disposable syringe is preferable

Figure 1.16 Collection of mercury droplets.

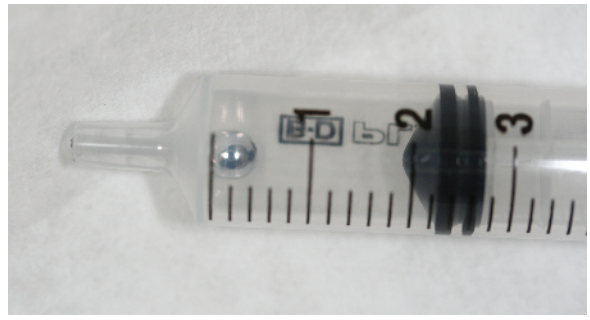


Figure 1.17 Mercury droplets collected in a syringe.

Figure 1.18 An amalgamator with a lid.

Figure 1.19 A mercury spillage kit.

To avoid the release of small globules into the workplace, the amalgamator machine should have a lid on it and be stood on a foil tray to collect any spillages without them contaminating the workplace (Figure 1.18). Any globules collected by these methods can be simply tipped into the waste amalgam store.

If there is a **larger spillage**:

- Wear suitable PPE
- Open windows to ventilate the area
- Inform the responsible person
- Use the contents of the mercury spillage kit to control the spread of the spillage (Figure 1.19)
- Mix the powders of flours of sulphur and calcium hydroxide with water to make a paste, and paint this around the spillage to contain it
- The remaining paste can be painted over the spillage
- Once dry, the contaminated paste and spillage are wiped up thoroughly with damp paper towels and disposed of in the waste amalgam store

If the size of the spillage is significant, such as a full bottle of mercury, or if globules roll into inaccessible areas, the work area must be sealed off and closed down. The HSE must be informed of the spillage, and Environmental Health will attend to clear away the contamination professionally and safely.

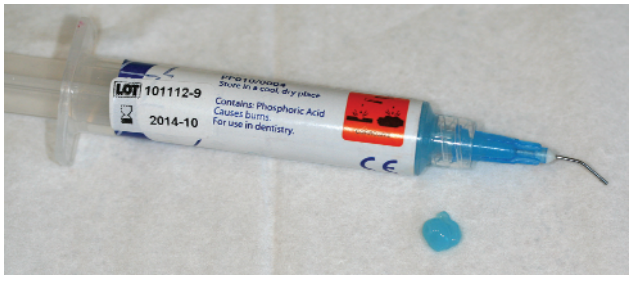


Figure 1.20 An acid etchant gel.

Acid etchant

This material is used during the placement of composite (tooth-coloured) fillings. As the name suggests, it is acidic and can therefore burn soft tissues inside the patient's mouth or the skin of those handling it. The material itself is 33% phosphoric acid and comes as either a liquid or a gel (Figure 1.20).

All staff handling the etchant must be wearing the correct PPE, and when placed within the patient's mouth it must be confined to the tooth undergoing restoration. Very careful aspiration must be used while the material is washed off the tooth, so that it does not fall elsewhere and burn the patient's oral mucosa. To help with this, the acid etchant is usually brightly coloured so that it is easily visible – some manufacturers produce a bright pink liquid, others a bright blue gel.

The manufacturer's instructions for use will show the necessary symbol indicating that it is a hazardous substance and will provide details of the first aid actions to be taken should an accident occur, in accordance with COSHH regulations.

Bleach (and other disinfectants)

With the major emphasis on robust infection control in all healthcare environments nowadays, including the dental workplace, exposure to many types of disinfectant throughout the working day is the norm for all staff. Some disinfectants can irritate the skin, the airway and the eyes when used carelessly, while others can cause irritation or initiate hypersensitivity or even allergic reactions in staff, no matter how low their exposure to the disinfectant. PPE consisting of gloves, mask and glasses should be worn when handling them and working areas must be well ventilated to avoid irritation of the airway. Manufacturers' instructions must always be followed, in particular the first aid advice recorded in the COSHH file in the event of an accident.

Having said that, all disinfectants have a huge role to play in the decontamination of work areas and fixed equipment in the dental practice. Bleach (sodium hypochlorite) is a powerful disinfectant and is used in many situations in the workplace:

- Fresh solution (10 000ppm ~ 1%) to disinfect all non-metallic, non-fabric surfaces within the surgery
- Fresh solution to disinfect impressions and removable prostheses before transferring between the patient and the laboratory
- Fresh solution to clean away blood spillages within the surgery

Other disinfectants used for surface and laboratory item decontamination include a variety of anti-microbial and isopropyl alcohol solutions, often also sold as spray solutions or pre-soaked wipes (Figure 1.21).

Bleach has an unpleasant taste and smell, and is a chemical irritant to soft tissues. It can cause tissue damage to the mouth and digestive tract, the eyes and the lungs if strong vapours are

Figure 1.21 Examples of disinfectants.

Figure 1.22 Bottle label displaying hazard symbol.

inhaled. Appropriate PPE must be worn whenever it is handled and fresh solutions made daily for the uses indicated earlier should be held in lidded containers, so that the noxious chlorine vapours do not become overpowering.

Disinfectant bottles of any solutions used will show the necessary hazardous substance symbol, and give the necessary first aid actions in the event of an accident, in line with the COSHH regulations (Figure 1.22).

Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations (RIDDOR)

From time to time an accident may occur within the dental workplace and the dental nurse must be aware of the correct procedure to be followed in each instance. Accidents that occur in the workplace fall into one of two categories:

- **Minor accidents** – these result in no serious injury to persons or the premises, and are dealt with "in house" and recorded in the accident book:
  - A written record of the minor accident must be made and kept by the workplace in the accident book, under the Notification of Accidents and Dangerous Occurrences Regulations (see Figure 1.15)
  - Examples of minor accidents include a trip or fall resulting in no serious injury, a clean (non-infectious) needlestick injury, or a minor mercury spillage that can be safely dealt with using the spillage kit

- **Major accidents** – these result in a serious injury to a person, or severe damage to the premises; they are classed as "significant events" and are therefore **notifiable incidents** that must be reported to the HSE under RIDDOR

Notifiable incidents do not include those occurring to a patient while undergoing dental treatment, but do cover all persons on the premises otherwise.

Once notified, the HSE will carry out an investigation into how the incident occurred, to determine whether it was purely an accident or whether the practice or a staff member was at fault. Advice will then be given on how to avoid similar incidents in future, but in serious cases prosecution may follow.

Dental nurses should remember that, once qualified and registered with the GDC, they are personally responsible for their own errors and acts of omission under health and safety law – so it may be that they are the ones who are prosecuted. While in the dental workplace as a student, the trainee dental nurse is under the supervision of a more senior colleague at any one time, and that senior person will be the one held accountable for any event under RIDDOR. The only exception to this would be if written records proved that the trainee had received the correct training in health and safety issues, but had knowingly and blatantly disregarded them, resulting in the occurrence of the notifiable incident.

The significant events covered by the regulations fall into one of three categories – injuries, diseases, or dangerous occurrences. Further information is available at www.hse.gov.uk/riddor.

As with any other workplace, the occurrence of an accidental injury while on the premises is a rare event in the dental world – but nevertheless injuries can, and do, happen. Minor injuries, as discussed earlier, are handled "in house" as they are not life-changing or do not result in serious harm. However, major injuries do result in serious harm or even death to the casualty.

The **injuries that must be reported** are:

- Fracture of the skull, spine or pelvis
- Fracture of the long bone of an arm or leg
- Amputation of a hand or foot
- Loss of sight in one eye
- Hypoxia (oxygen deprivation to the brain) severe enough to produce unconsciousness
- Any other injury requiring 24-hour hospital admission for treatment

The dental team may be exposed to common diseases in the workplace on a daily basis from patients (such as with simple colds or chest infections), or they may be exposed away from the workplace – in this case they are at risk of transmitting the infection to others in the workplace themselves. Dental personnel are also at risk of exposure to more serious pathogens by direct contact with infected blood and saliva from patients, and particularly from an inoculation injury.

The risk of infection by airborne diseases is increased significantly when the workplace is inadequately ventilated or poorly temperature-controlled, and through the possibility of cross-infection when the workplace is inadequately cleaned.

The **diseases that must be reported** under RIDDOR are any that cause acute ill health as a result of infection with dangerous pathogens or infectious materials, such as:

- Legionella – causing Legionnaires' disease
- Hepatitis B or hepatitis C infection – both linked to the development of liver cancer
- Human immunodeficiency virus (HIV) – causing acquired immune deficiency syndrome (AIDS)

In the hospital environment or in those with poor personal hygiene, dental personnel may also be exposed to, or even transmit, other dangerous pathogens, such as methicillin-resistant *Staphylococcus aureus* (MRSA – referred to as one of the "superbugs" by the lay public), or *Clostridium difficile* (an intestinal microorganism associated with diarrhoea and tetanus).

A dangerous occurrence is a significant event that could result in a serious injury or death to anyone on the premises at the time that it happens. It would result in the attendance by the emergency services (ambulance, firefighters and/or police) as well as specialists in service provision, depending on the cause (e.g. gas, electricity, service engineer, environmental health officer).

The **dangerous occurrences that must be reported** are:

- Explosion, collapse or burst of a pressure vessel (an autoclave or compressor)
- Electrical short circuit or overload that causes more than a 24-hour stoppage of business
- Explosion or fire due to gases or inflammable products that causes more than a 24-hour stoppage of business
- Uncontrolled release or escape of mercury vapour due to a major mercury spillage
- Any accident involving the inhalation, ingestion or absorption of a hazardous substance that results in hypoxia that is severe enough to require medical treatment

Several of the dangerous occurrences listed involve a catastrophic failing of an electrically operated equipment item, resulting in a fire or an explosion. Fire is a daily hazard that can occur in any workplace and, as discussed previously, a risk assessment of the dental workplace will identify several specific fire hazards.

In addition to the fire potential from chemicals and gases, all dental equipment is electrically operated and may short circuit, malfunction or spark and cause a fire at any time, especially if not serviced and maintained correctly. Of equal importance is the fact that all electrical items and equipment are handled and operated correctly by all members of staff at all times, so that the risk of a dangerous occurrence is reduced to a minimum. Dental nurses have a duty to behave in a way that does not endanger the health and safety of anyone (including themselves) while on the premises, and not to use items, materials or equipment in a way that would put someone at risk of harm.

The health and safety requirements and protocols to be followed may have to vary between workplaces – those suitable for a hospital may not be relevant for a small dental practice, for example – and dental nurses must be familiar with any variations between workplaces and act accordingly. Sensible precautions to avoid accidents that should apply to all workplaces, however, include the following:

- **Surgery area** – no trailing wires from electrical equipment; good ventilation at all times; all chemicals stored away safely and securely when not in use
- **Reception and waiting room** – no trailing wires from electrical equipment; heaters surrounded with a guard to prevent burns; floor uncluttered to avoid trips; display cabinets not overloaded
- **Kitchen and staff rest room** – kept hygienically clean and tidy; no storage of stock or waste materials in food fridge; cupboards not overloaded; all equipment undergone portable appliance testing (PAT)
- **Store rooms** – no access to anyone except staff members; floors uncluttered
- **Stairs** – double hand rails for ease of use; uncluttered steps; stair covering kept in good repair

Waste disposal

The current legislation and regulations in relation to the safe disposal of hazardous waste apply to all healthcare waste producers, which includes all dental workplaces. Healthcare waste is of particular concern for environmental and personal safety because, by its nature, it is likely to be contaminated with body fluids or body parts and could therefore potentially cross-infect anyone who handles it. This may be dental personnel or waste management contractors as well as the public, if the waste is not disposed of safely. In addition, if hazardous waste is not disposed of correctly, it may also pose an environmental contamination issue, such as the incorrect disposal of amalgam waste causing mercury contamination in a landfill site.

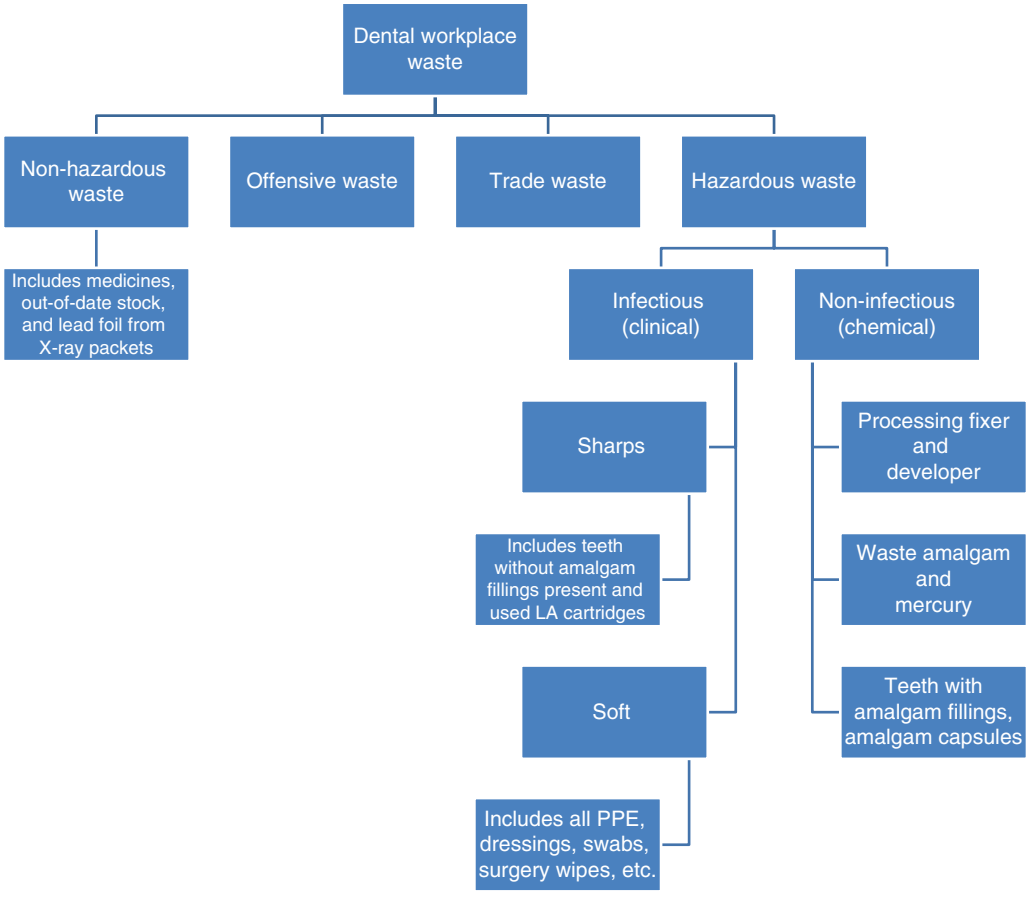


Figure 1.23 Current waste classifications relevant to the dental workplace. PPE, personal protective equipment; LA, local anaesthetic.

Some waste products in the dental workplace will pose a greater risk of cross-infection than others, while other waste products are hazardous by their chemical nature and possible toxicity. All must be correctly segregated, safely stored and then handed over to a licensed waste contractor to be disposed of in a suitable manner.

Dental workplaces produce a wide range of both hazardous and non-hazardous wastes, and in order to segregate the waste correctly, it must first be identified and then classified in line with the current regulatory guidance. The legislation that sets out which waste products must be classed as hazardous is contained in the Special Waste and Hazardous Waste Regulations (2005). The current waste classifications relevant to the dental workplace are shown in Figure 1.23.

Offensive waste is defined as "wastes which are non-infectious, do not require specialist treatment or disposal but may cause offence to those coming into contact with it". In the dental workplace this will include any PPE, cleaning towels, X-ray films and other similar items that have not been contaminated with body fluids, medicines, chemicals or amalgam, as well as toilet hygiene waste. Trade waste includes items such as dental equipment (dental chairs, curing lights, portable suction units, etc.), as well as commercial electronic waste like computer screens, televisions, fluorescent lighting tubes and batteries.

Figure 1.24 Blue-lidded sharps box.

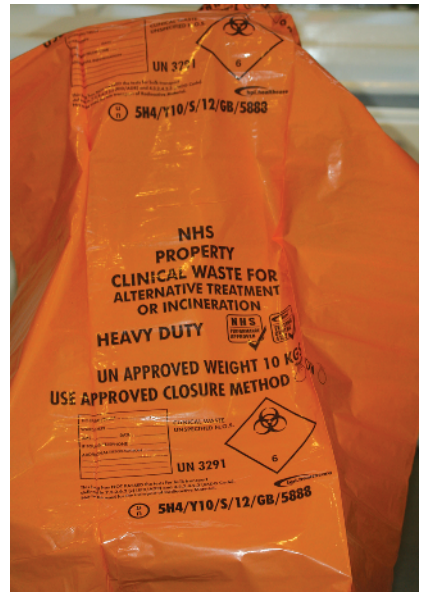


Figure 1.25 An orange hazardous waste sack.

Each category of waste must be segregated and stored in the correct container, so that it is easily recognised by the waste contractors and can also be handled safely without any risk of cross-infection. The dental nurse must be aware of the correct segregation categories and the correct storage containers to be used in their workplace, and follow the waste storage and disposal policy at all times.

Details of the storage containers to be used are as follows:

- Offensive waste – yellow sack with black stripe, tied at the neck
- Non-hazardous medicines and out-of-date stock – blue-lidded yellow rigid container (Figure 1.24)
- Soft infectious (clinical) hazardous waste – orange sack, no more than three-quarters full and tied at the neck (Figure 1.25)
- Sharps infectious (clinical) hazardous waste – all yellow rigid container, no more than two-thirds full (Figure 1.26)
- Non-infectious (chemical) hazardous waste:
  - Processing chemicals – separate securely lidded, rigid containers (Figure 1.27)
  - Waste amalgam/mercury – white, securely lidded container with a mercury vapour suppressant sponge insert (see Figure 1.13)
  - Amalgam-containing teeth and spent capsules – white, securely lidded containers with a mercury vapour suppressant sponge insert (see Figure 1.14)

Dental nurses will be required to demonstrate the ability to handle waste safely and dispose of it appropriately during observation sessions with their assessor.

In accordance with the Environmental Protection Act, the duty of care is with the dental workplace to ensure that healthcare waste is managed and disposed of safely and correctly. To comply fully, managers of every dental workplace must ensure that they:

- Have a written healthcare waste policy in place which identifies a named person as responsible for waste management on the premises (referred to as the "registered manager" in HTM 01-05)
- Provide staff access to the policy and give recorded training in correct waste management methods

Figure 1.26 A sharps box.

Figure 1.27 Waste processing chemical storage drums.

- Segregate waste in accordance with Figure 1.23 and store it safely while on the premises, away from public access
- Use the correct storage containers for each waste category
- Only use licensed waste collectors for the removal from the premises and disposal of the waste at an authorised disposal site
- Accurately describe the container contents of all non-hazardous waste on transfer notes, which must be kept for a minimum of two years from the date of collection
- Accurately describe the container contents of all hazardous waste on consignment notes, which must be kept for a minimum of 3 years from the date of collection
- Receive and keep the quarterly "consignee returns" documentation, which records the final destination of the hazardous waste consignment, and its disposal details
- Register with the Environment Agency as a hazardous waste producer if more than 500 kg of hazardous waste is produced annually

Waste handling training

All dental personnel who are likely to be involved in handling any healthcare waste must be correctly trained to do so. The training should cover all of the following points:

- Risks associated with each category of waste (such as sharps injury, exposure to toxic vapours, cross-infection)
- Correct classification, segregation and storage procedures, in line with the healthcare waste policy of the workplace
- COSHH information on all non-infectious hazardous waste chemicals used on the premises
- Safe handling, including the use of appropriate PPE and moving techniques

- Correct procedures in the event of spillages or accidents
- Correct completion of relevant documentation – transfer notes and consignment notes

The avoidance of cross-infection when handling hazardous waste relies on dental nurses wearing the appropriate PPE at all times, following the infection control policy of the workplace, and ensuring that their own immunity from the relevant pathogens is up to date, through vaccination. This is especially important with regard to immunisation against hepatitis B.

The principles of infection control, including details of pathogens and immunity, are discussed in detail in Chapter 12.

Ionising radiation

Ionising radiation, in the form of X-rays, is widely used in dentistry as a diagnostic and treatment tool. However, there is no "safe" level of use of ionising radiation – every X-ray exposure can cause some amount of tissue damage in the patient, or indeed anyone else in the imaging area who is exposed to the X-ray beam. An overdose can cause serious health effects, ranging from a mild burn to leukaemia and, ultimately, death.

For this reason, specific legislation is in place to ensure full compliance with the health and safety aspects of ionising radiation by all dental workplaces, under the following regulations:

- Ionising Radiation Regulations 1999 (IRR99)
- Ionising Radiation (Medical Exposure) Regulations 2000 (IR(ME)R2000)

While IRR99 is concerned with the protection of staff and IR(ME)R with the protection of patients, the aim of both sets of regulations is to keep the numbers of X-ray exposures, and their dose levels, to the absolute minimum required for clinical necessity, at all times.

In relation to these regulations, dental nurses must be fully knowledgeable of the following:

- Actions they can take in relation to imaging procedures
- Actions they cannot take in relation to imaging procedures
- How to protect patients and others from unwanted ionising radiation exposure

The safe use of dental radiography is discussed in detail in Chapter 14, and the roles and responsibilities of dental nurses in ensuring that they reduce the risks to themselves and others during the use of ionising radiation are reiterated here.

In relation to IRR99 the dental nurse must have received documented training and then comply with the following:

- Local rules in association with each X-ray machine in the dental workplace, in particular:
  - Location of the 1.5-metre controlled area and the 2-metre safety zone (Figure 1.28)
  - Location of the isolator switch in case of malfunction
  - Contingency plan in case of malfunction
  - Name of the radiation protection supervisor (RPS) in the workplace, as the person to contact in case of malfunction
  - Methods in place to ensure that no person but the patient can enter the controlled area during exposure, and to follow them at all times
- The dental workplace requirements with regard to the use of monitoring badges
- The GDC's continuing professional development requirements with regard to ionising radiation updates, which is a core topic

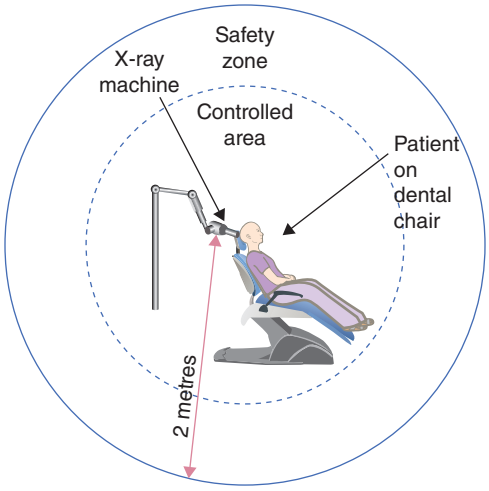


Figure 1.28 Controlled area and safety zone. Source: *Levison's Textbook for Dental Nurses*, 11th edition (Hollins), 2013. Reproduced with permission of Wiley-Blackwell.

In relation to IR(ME)R 2000, dental nurses must have received documented training and then comply with the following:

- Only carry out those duties that they are legally able to, specifically:
  - Patient identification
  - Setting up the resources to enable exposure to occur
  - Pressing the exposure button, but only when requested by the "set up" operator
  - Processing and mounting of radiographs
  - Contribute to quality assurance programmes
- Correctly store dental films so that they do not become damaged before use
- Maintain processing equipment correctly, so that re-takes are not necessary
- Use processing chemicals correctly to avoid accidents and be aware of COSHH guidelines in relation to any accident and follow them accordingly
- Maintain the security of controlled areas at all times in accordance with the workplace policies, to avoid the possibility of accidental exposures

If any processing chemicals are accidentally spilled, the following actions should be taken:

- Remove all other persons from the area, to avoid the inhalation of any fumes as well as to avoid someone slipping on the wet floor
- Erect the "wet floor" hazard sign
- Ventilate the area if possible to remove the chemical fumes – these are not harmful as such, but they are strong-smelling and may be irritant to such persons as asthmatics
- Apply appropriate PPE – rubber gloves, safety glasses, face mask, and plastic apron
- Cover the spillage with paper towels to soak up the chemicals, or mop up the excess liquid and carefully pour it into the appropriate storage drum
- Once the liquid has been removed, wash the floor area with a suitable detergent solution and leave the hazard sign in place until the area is completely dry
- Complete the accident book, if relevant, and review the incident to determine if changes are required in the handling and use of the processing chemicals, including further staff training

Occupational hazards

The three major occupational hazards in dentistry are:

- Exposure to ionising radiation
- Exposure to high levels of mercury, resulting in mercury poisoning
- Exposure to pathogens, resulting in cross-infection

All three hazards are relevant to the dental nurse, and they must be trained to be aware of the dangers and know how to avoid them. The hazards associated with ionising radiation and mercury are described earlier, and cross-infection by inoculation injury is covered in the next section.

Inoculation injury

This is an injury caused by the piercing of the skin (or other membrane) by a sharp object, and in this context the sharp object involved is usually a dental instrument or needle. Nearly all dental procedures involve the use of sharp items; these include local anaesthetic needles, sharp instruments such as probes, and scalpel blades. All must be handled with great care by staff to avoid an inoculation injury.

Every dental workplace must have a policy in place to avoid a sharps injury and it should ideally include all of the following points:

- The operator using a local anaesthetic needle should be the person responsible for its re-sheathing and safe placement in a sharps bin, so that injury to others does not occur as there is no transference of the sharp item from one person to another
- Needle guards should be used when re-sheathing needles, so that they can be placed in their plastic sheath without being held with the fingers (Figure 1.29)
- Heavy-duty rubber gloves and full PPE should be worn by any staff responsible for instrument cleaning and debridement before sterilisation

Although a sharps injury from a sterile, unused instrument may be momentarily painful, it is of no consequence save to reconsider the level of care taken by the staff member involved. However, if a contaminated inoculation injury occurs as a result of an object which has been used on a patient, the following actions must be carried out:

- Stop all treatment immediately and attend to the wound
- Squeeze the wound to encourage bleeding, but do not suck it
- Wash the area with soap and running water, then dry and cover the wound with a waterproof dressing
- Note the name, address and contact details of the source patient if a contaminated item is involved, so that their medical history can be checked immediately
- Complete the accident book
- Report the incident to the senior dentist/line manager
- The consultant microbiologist at the local hospital must be contacted immediately if the source patient is a known or suspected HIV or hepatitis C carrier, as emergency antiviral treatment must commence within 1 hour of the injury

The contact details for the consultant microbiologist should be readily available in the infection control policy documentation, and updated whenever necessary.

Dental nurses will be required to demonstrate their ability to deal with an inoculation injury during observation sessions with their assessor.

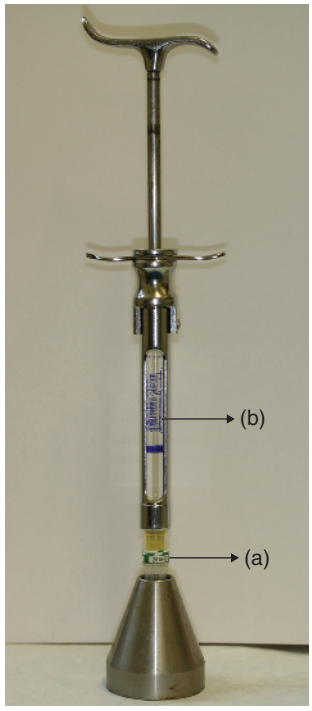


Figure 1.29 A re-sheathing device. (a) Needle guard in place. (b) Syringe re-sheathed in the device.

General safety measures

These relate to any work premises where any staff are employed to provide a service to the public, and therefore apply to all dental workplaces, whether they are practices, clinics or hospital departments. Those in the following list are all common-sense precautions aimed at preventing injury to anyone using or visiting the premises, and dental nurses should report any issues they discover to the responsible person in their workplace if they come across anything they believe to be a potential hazard.

General safety measures in the dental workplace should include all of the following:

- A safe means of entry which is adequately lit and unobstructed, including for disabled people
- Non-slip floor coverings which are secure, to prevent tripping
- No dust traps in the décor of surgical areas, such as those present with embossed wallpaper coverings
- No sharp edges on furniture and fittings
- Guards around fires and heaters to avoid burns
- No trailing electrical cables that could cause tripping
- All portable electrical appliances must be inspected yearly for wear and tear – this is called PAT testing, and may be carried out by any approved person as long as written records are kept
- All electric appliances should be disconnected overnight as a matter of routine, although this may not be possible with some items, such as a fridge or the main computer server
- A fully stocked first aid kit should be available for minor injuries

Manual handling

The other important area of general safety for the dental nurse is that involving any moving or lifting work, which may cause personal injury if not done correctly. This is collectively referred to as manual handling.

In the majority of dental workplaces, the usual manual handling that occurs is the transport of boxes containing stock items, or the movement of waste containers in and out of storage. Hospital departments and dental clinics may also require staff to be involved with the movement of disabled, sedated or unconscious patients, and separate and specific training must be given in these areas by the employer.

Lifting heavy or awkward items incorrectly can result in all kinds of injuries to staff, and employers must ensure that, as far as is reasonably practicable, they adhere to the regulations laid down in the Manual Handling Operations Regulations 1992. These were further revised in 2002, and state the following:

- All hazardous manual handling should be avoided, as far as is reasonably practicable
- Any hazardous manual handling that cannot be avoided must be correctly risk-assessed
- All efforts must then be made to reduce the risk of injury as far as possible

While carrying out the risk assessment of any manual handling and lifting that has to be carried out in the dental workplace, the following points must be considered when deciding whether the task is hazardous or not:

- The weight and dimensions of the object being moved or lifted
- The likelihood of staff having to reach, bend, twist or stoop while moving or handling the object
- The frequency of the task
- The likelihood of excessive movements being required, such as pushing or pulling
- The distance that the object has to be moved
- The need for the object to be carried up or down stairs
- The physical ability of the staff involved in moving and handling
- The existence of any medical conditions that contraindicate staff from moving or handling objects (this includes pregnancy)
- The need for any training to be given in the correct techniques of moving and handling

If each point is taken separately, it can be seen that much can be done to avoid injury to staff during moving and handling activities.

Weight and dimensions

The heavier the load and the greater its dimensions, the more difficult it will be to handle and the more likely it is that injury will occur, so consider the following:

- Split the load to make it lighter
- Ask other staff to help while lifting and moving it
- Use a trolley or other handling aids, if available

Awkward movements and frequency

Examples of these include twisting, and bending while lifting or moving a load – and the more times the move is carried out, the more likely it is to cause injury, so consider the following:

- Clear the path of travel before lifting, to avoid having to twist, etc.
- Move the feet to change direction, rather than twisting, etc.

- When precise positioning is required, put the load down then adjust its position
- When loads have to be moved frequently, use a trolley or other handling aid to avoid straining the back

Excessive movements

Pushing and pulling lighter loads do not usually cause a problem, but when heavier loads are involved, either they must be split into smaller units first or a trolley or other handling aid must be used.

In most instances, large boxes of stock can be opened and put into their place of storage individually, to avoid having to push or pull them into position.

Distance and stairs

It makes sense to move objects the minimum distance whenever possible and to avoid having to carry them up and down stairs manually. Where stock is stored should be carefully considered, to avoid repetitive strain injuries to staff, and a lift must always be used if available. Otherwise, a trolley or other handling aid needs to be provided.

Physical ability and medical conditions

Elderly or unfit staff members are more likely to injure themselves while moving and handling, by over-estimating their own capabilities, and the following must be considered:

- Elderly staff tend not to be as strong as younger staff and may have less stamina to hold a load for any length of time
- Overweight staff will find it difficult to hold loads as close to their centre of gravity as they need to for stability, and this will put unnecessary strain on their arms and back
- Short staff will find it more difficult to lift and carry loads than taller staff
- Male staff tend to be stronger than female staff, although this cannot always be assumed to be the case
- Various medical conditions will prevent some staff from being capable of moving and handling objects without risking injury to themselves, such as back problems, heart and respiratory conditions, hernias
- Pregnant staff should not be involved in moving and handling heavy objects

Training

A correct handling technique should be taught to all staff involved in moving and lifting objects in the dental workplace, and this may involve the following:

- Sending the staff (and the employer) on a well-run training course to learn the best posture to adopt while lifting and moving loads
- Acquiring trolleys and other handling aids for the premises
- Changing the location of storage rooms, to make them closer to the delivery point and ideally at ground level
- Acquiring more storage cupboards or shelves at waist height for heavier items
- Acquiring step ladders for the placement of light loads in storage spaces above shoulder level