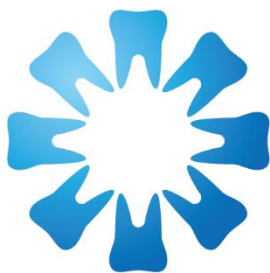




# HEALTH & SAFETY FOR DENTAL PRACTICE

Be safe at work



**SADA**

The South African Dental  
Association (**SADA**) NPC

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## Introduction

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The legal framework within which dentists practice in South Africa is complex.

Dentists are regulated by many laws such as:

- Occupational Health and Safety Act (OHSA);
- National Health Act (NHA) administer all health establishments.
- Health Professions Council regulates registration and activities of dentists.
- Dental Technicians Act, 1979, regulates dentists doing laboratory work or operating a dental laboratory.
- The Constitution of the Republic of South Africa dictates that: *"every person has the right to a working environment that is not harmful to their health nor well-being"*.

Dentists as employers, are required to ensure a safe working environment as far as reasonably possible for all employees, as well as individuals attending the facility.

This means practitioners prevent injury and suffering, prevent damage to infrastructure and equipment, and avoid unnecessary costs to staff and the practitioner as employer.

There are moral, social, financial, and legal reasons for preventing accidents.

## The National Health Act (NHA)

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The NHA, requires health establishments must implement measures that minimise injury or damage to the person or property of health care workers (HCWs).

HCWs must be protected from physical harm, with their working environment made safe and free from any hazardous incidents. They must be provided with protective clothing against airborne viruses and protocols for needle stick injuries.

NHA is to be read with the Occupational Health and Safety Act and labour legislation governing working conditions.

Where exposure to special risks is unavoidable, measures should be taken to minimise it. These include the provision and use of protective clothing, shorter hours, more frequent rest breaks, temporary removal from the risk or longer annual holidays should be provided for in respect of nursing personnel regularly assigned to duties involving special risks so as to reduce their exposure to these risks.

## Ethical Rules of HPCSA

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There are many ethical guidelines which speak to safety and protection of patient. The practitioner will be judged on what requirements would be reasonable to ensure that patient safety was protected.

# Occupational Health & Safety Act, 1993 (OHSA)

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## OSH regulatory framework

The OHSA is the leading occupational safety and health legislation and applies to all dental practices.

Its aim is to "provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith"

The OHSA, requires the practitioner to bring about and maintain, as far as reasonably practicable, a work environment that is safe and without risk to the health of the workers. *"Reasonably practicable refers to what a reasonable person would do – a person with sound judgement and whose behaviour is moderate and fair".*

With the OHSA, there is the Compensation for Occupational Injuries and Diseases Act 130 of 1993, which provides a compensation scheme for victims of occupational accidents and diseases and their dependants. In addition, there are ancillary occupational safety and health laws (e.g. the Hazardous Substances Act 15 of 1973 – see below).

The Minister of Employment and Labour is required designate an officer serving in the Department as chief inspector for the purposes of the OHSA. The inspectors conduct investigations in terms of the act.

## Employers' duties and responsibilities to protect the safety and health of workers and others

### Duty to ensure the health and safety of employees

Every practitioner as employer has a general duty to provide and maintain, as far as is reasonably practicable, a working environment which is safe and without risk to the health of employees.

To ensure that these duties are complied with, the practitioner must:

- Identify potential hazards;
- Take precautionary measures necessary to protect workers against the identified hazards and provide the means to implement these precautionary measures
- Provide the necessary information, instructions, training and supervision while keeping the extent of workers' competence in mind.
- Not permit anyone to carry on with any task unless the necessary precautionary measures have been taken.
- Enforce the necessary control measures in the interest of health and safety.
- Workers must ensure that the precautionary measures are implemented and maintained.
- Take steps to ensure that everybody complies with the requirements of the act
- See to it that the work being done and the equipment used, is under the general supervision of a worker who has been trained to understand the hazards associated with the work and machinery

### Duty to protect the health and safety of visitors

Practitioners must also ensure that visitors are not exposed to hazards to their health. They must identify hazards and assess risk to persons such as patients and other visitors to the practice.

### Duty to provide personal protective equipment (PPE)

- Practitioners are obliged to provide and maintain systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health.
- In addition, the OHSA specifically prohibits the practitioner from deducting from employee's remuneration anything they are required to do or provide for health and safety of employees (like deduct costs of PPE supplies).

*The PPE requirements in dealing with COVID-19 pandemic is discussed in more detail below.*



## Duty to ensure the usage of personal protective equipment

Practitioners must provide and ensure correct personal protective equipment is used and take all necessary measures to ensure that the requirements of the OHSA are complied with. They must enforce such measures as may be necessary in the interest of health and safety.

Practitioners must also train staff on the proper use of personal protective equipment, limitations and the appropriate maintenance of that equipment.

For the type of PPE required for COVID-19, please consult the “SADA DENTAL PROTOCOL IN RESPONSE TO THE COVID-19 PANDEMIC” of May 2020.

## All workers have the right to be informed

All employees must be informed about the health and safety hazards of any work being done and the precautionary measures against these hazards. This is based on the principle that dangers in the practice must be addressed by communicating and with cooperation between the practitioner and employees and share this responsibility.

## Sanitary installations

- Practitioners must provide sanitary facilities at a workplace with toilet paper and water closet pan with a seat, supply towel to every employee's sole use or disposable paper towels or hot air blower or continuous cloth towels, toilet soap free of charge to employees.
- Provide a conspicuous sign outside the entrance to such room to indicate the gender of the persons for whom the room is intended and ventilate such rooms.

## Drinking water

Employers are required to make available an adequate supply of drinking water for his or her employees at their workplace and clearly mark those not fit for human consumption.

## WORKERS' RIGHTS & DUTIES

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### Right to information

Employees must access to the Occupational Health and Safety Act and regulations, health and safety rules procedures and standards expected by practitioners.

Employees have the right to information about health and safety hazards in the workplace, the precautionary measures which must be taken and procedures if exposed to substances hazardous to health.

### Duty to take reasonable steps to protect their own safety and health

Employees must also take reasonable care for the health and safety of himself or herself and other persons who may be affected by his or her acts or omissions.

### Duty to comply with OSH-related requirements

Employees are also under a duty imposed on by the practitioner to cooperate with such practitioner to ensure that duty or requirement to be performed or complied with.

## Right to enquire about risks and preventive measures

In case where employees are regularly required to do night shift after 23:00 and before 06:00 the next day must inform the employee in writing, or orally, of any health and safety hazards associated with the work that the employee is required to perform. Here the employee has the right to undergo a medical examination and suffering from a health condition arising out of night work, the employee may request to be transferred to day work as soon as possible.

Employees must carry out any lawful instruction which the employer prescribes with regard to health and safety wear, the prescribed safety clothing or use the prescribed safety equipment where it is required.

If he or she is involved in an incident that may influence his or her health or cause an injury, report that incident to the employer, but no later than by the end of the shift.

## Right to remove themselves from a dangerous situation

The OHSA prohibits any form of victimization against an employee who has refused to do anything which he or she is prohibited from doing in terms of the Act.

## Inspections

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### OSH inspection and enforcement of OSH legislation

The Occupational Health and Safety Act is administered by the Inspections and Enforcement Services Branch: Occupational Health and Safety of the Department of Labour in all provinces. Occupational health and safety inspectors from these provincial offices carry out inspections and investigations at workplaces.

Most inspections are usually planned on the basis of accident statistics, the presence of hazardous substances, such as the use of benzene in laundries, or the use of dangerous machinery in the workplace. Unplanned inspections, on the other hand, usually arise from requests or complaints by workers, employers, or members of the public. These complaints or requests are treated confidentially.

### Appointment of OSH inspectors

The Minister appoints the inspector to perform, subject to the control and direction of the chief inspector, any or all of the function assigned to an inspector by the Occupational Health and Safety Act.

## OSH inspectors' powers

### Power to enter workplaces

An inspector may, without previous notice, at all reasonable times, enter any practice premises which are occupied or used by a practitioner or on or in which an employee performs any work or any plant or machinery is used, or which he/she suspects to be such premises.

### Power to inspect and carry out any examination, test or enquiry

An inspector may, question any person who is or was on or in such premises, either alone or in the presence of any other person from the practice, require from any person who has control over or custody of a book, record or other document on or in those premises, to produce to him forthwith, or at such time and place as may be determined by him, such book, record or other document; examine any such book, record or other document or make a copy thereof or an extract therefrom; require from such a person an explanation of any entry in such book, record or other document; inspect any article, substance, plant or machinery which is or was on or in those premises, or any work performed on or in those premises or any condition prevalent on or in those premises or remove for examination or analysis any article, substance, plant or machinery or a part or sample thereof; seize any such book, record or other document or any such article, substance, plant or machinery or a part or sample thereof which in his opinion may serve as evidence at the trial of any person charged with an offence under this Act or the common law.

Provided that the employer or user of the article, substance, plant or machinery concerned, as the case may be, may make copies of such book, record or document before such seizure.

#### Power to investigate

An inspector may investigate the circumstances of any incident which has occurred at or originated from a workplace or in connection with the use of plant or machinery which has resulted, or in the opinion of the inspector could have resulted, in the injury, illness or death of any person in order to determine whether it is necessary to hold a formal investigation.

### OSH inspectors' enforcement powers

#### Powers of inspectors

If an inspector finds dangerous or adverse conditions at the workplace, he or she may set requirements to the employer in the following ways:

**Prohibition notice:** In the case of threatening danger, an inspector may prohibit a particular action, process, or the use of a machine or equipment, by means of a prohibition notice. No person may disregard the contents of such a notice and compliance must take place with immediate effect.

**Contravention notice:** If a provision of a regulation is contravened, the inspector may serve a contravention notice on the workers or the employer. A contravention of the Act can result in immediate prosecution, but in the case of a contravention of a regulation, the employer may be given the opportunity to correct the contravention within a time limit specified in the notice which is usually 60 days.

**Direction or Improvement notice:** Where the health and safety measures which the employer has instituted, do not satisfactorily protect the health and safety of the workers, the inspector may require the employer to bring about more effective measures. A direction notice which prescribes the corrective measures is then served on the employer.

**OTHER POWERS** To enable the inspector to carry out his or her duties, he or she may enter any workplace or premises where machinery or hazardous substances are being used and question or serve a summons on people to appear before him or her. The inspector may request that any documents be submitted to him or her, investigate and make copies of the documents, and demand an explanation about any entries in such documents. The inspector may also inspect any condition or article and take samples of it, and seize any article that may serve as evidence.

#### Note:

The above-mentioned powers of inspectors are not absolute. Any person who disagrees with any decision taken by an inspector, may appeal against that decision by writing to the Chief Inspector, Occupational Health and Safety, Department of Labour, Private Bag X117, Pretoria, 0001.

Health and safety representatives are required to be appointed only where there are 20 or more employees.

## Liability

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*Liability means that you are legally responsible for something. It may be imposed under civil law and criminal law.*

#### Criminal liability

Criminal law – a type of 'public law' – deals with the relationship between the state and the general population. This means that the state would be involved in a criminal law case against a person who has been negligent or wilfully breaks the law.

Any employee found guilty of an offence in terms of the OHS Act shall, on conviction, be liable to a fine not exceeding R50,000 or to imprisonment for a period not exceeding one year, or to both.

An employer found guilty of an offence in terms of the OHS Act shall, on conviction, be liable to a fine not exceeding R100,000 or to imprisonment for a period not exceeding two years, or to both.

*If any person disobeys orders or rules that were put in place to protect health and safety, it would be a criminal offence.*

#### Civil liability

Civil law – a type of 'private law' – deals with disputes between individuals and/or organisations where a (negligent or intentional) wrongful act harms another. The victim lays a claim in a civil law case and if successful, is awarded compensation. For example, the victim of a car accident claims damages against the driver for loss or injuries sustained in the accident.

*Note: if a practitioner as owner fails to do something that s/he is expected to do in terms of the OHS Act, s/he shall not incur any civil liability.*

### **Vicarious liability**

Vicarious liability means that the Line Manager can be held responsible for any offence committed by a subordinate employee, according to public law. It will depend on whether the employee was found to be acting in a personal capacity, or in the course of his/her employment.

To avoid vicarious liability, the employer should ensure that all reasonable steps have been taken to prevent the employee's acts or omissions.

## RISKS and HAZARDS

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It is important to identify any hazards in the workplace, assess the associated risks, and take appropriate steps to remove or minimise them.

The employer must, as far as is reasonably practicable, make employees aware of any health and safety hazards attached to any work that they do, as specified in the OHS Act section 13. The employer must also provide, and ensure that employees use, the necessary precautionary measures associated with these hazards.

### Hazards

Hazard = a source of or exposure to danger, that can cause injury, illness or death. Hazards are generally considered to be unsafe conditions or unsafe acts (see below).

#### Unsafe conditions

There are many causes and contributing factors in workplace incidents. Here are some examples of unsafe conditions which could play a role in causing an accident:

- Disorderly/messy work area
- Poor ventilation
- Protective clothing not available
- Slippery floor
- Insufficient lighting
- Overcrowded work space
- Faulty equipment
- Loose items
- Moving machinery
- Hazardous substance storage.

#### Unsafe acts

Here are some examples of unsafe acts which could play a role in causing an accident:

- Working without safety equipment or protective clothing
- Working in a dangerous area
- Doing unauthorised work
- Leaving items standing in an unsafe place
- Fooling around or taking chances.
- Working without correct skills or knowledge
- Working in a rush
- Working with items unsecured
- Working on moving machinery

*Safe working behaviour + safe environment = less chance of accidents.*

### Hazard classification

For your interest, a more complex perspective classifies hazards according to the following categories:

<b>Physical hazards</b>	noise, vibrations, temperature, humidity, dust levels, electricity, lighting, radiation, working at heights, unguarded machinery, moving machinery parts, items that cause slipping or tripping, etc.
<b>Ionising radiation</b>	<a href="#">Discussed in more detail under Radiation.</a>
<b>Vibration and noise</b>	Ensure noise is either prevented or adequately controlled.
<b>Working at height</b>	Employees working from a height must do so with ladders or scaffoldings.
<b>Working in confined spaces</b>	Ensure adequate air and the space is safe
<b>Risks arising from poor maintenance of workplace facilities</b>	Properly maintain workplace and ensure workplace is safe
<b>Contraction of HIV in the workplace</b>	Ensure that the risk of HIV transmission in the workplace is minimal.
<b>Chemical Hazards</b>	Such as from gases, chemical dusts, liquids, fumes, mists, vapours.
<b>Biological:</b>	Such as blood-borne infections, viruses, bacteria, fungi, insect bites, faeces, poisonous plants and animals.
<b>Ergonomic Hazards</b>	Provide an ergonomically sound seat for all employee required to work while sitting;

<b>Psycho-social Hazards</b>	Such as work pressure, job security, job satisfaction, management style, health issues, personal stress.
<b>Occupational violence</b>	Employers have a constitutional obligation to protect the dignity of employees. Prevent assaults on employer, fellow employees, clients or customers which is a serious misconduct.
<b>Alcohol</b>	No person under the influence of alcohol or drugs shall enter any premises where machinery is used
<b>Protection of pregnancy at work</b>	Employers may not require or permit a pregnant employee or an employee who is nursing her child to perform work that is hazardous to her health or the health of her child.
<b>Protection of lactating women at work</b>	May not require a pregnant employee or an employee who is nursing her child to perform work that is hazardous to her health or the health of her child.

Some examples of hazards and their potential impacts:

Hazard		Potential impacts
1. Hot surface	Unsafe Condition	<ul style="list-style-type: none"> <li>i. burn injury;</li> <li>ii. infection;</li> <li>iii. damaged equipment; etc.</li> </ul>
2. <i>Touching</i> a hot surface	Unsafe Act	<ul style="list-style-type: none"> <li>i. burn injury;</li> <li>ii. infection;</li> <li>iii. damaged equipment; etc.</li> </ul>
3. Bloody material	Unsafe Condition	<ul style="list-style-type: none"> <li>i. infection by blood-borne pathogen;</li> <li>ii. HIV/AIDS;</li> <li>iii. hepatitis B virus;</li> <li>iv. long-term health condition; etc.</li> </ul>
4. <i>Unprotected</i> handling of bloody material	Unsafe Act	<ul style="list-style-type: none"> <li>i. infection by blood-borne pathogen;</li> <li>ii. HIV/AIDS;</li> <li>iii. hepatitis B virus;</li> <li>iv. long-term health condition; etc.</li> </ul>
5. Exposed moving part on machine	Unsafe Condition	<ul style="list-style-type: none"> <li>i. injury &amp; blood loss;</li> <li>ii. amputation;</li> <li>iii. infection;</li> <li>iv. iv. damaged machinery; etc.</li> </ul>

## Risk assessment

Practitioners must carry out risk assessment by identifying hazards in the practice which may carried out at specific intervals and involve relevant staff. These assessments must be thorough, include all areas, make notes and look for root causes.


They should involve relevant staff, and follow the basic steps:

- a) Identify the hazards;
- b) Identify who might be harmed and how (potential impacts);
- c) Evaluate the risks and decide on control measures;
- d) Record the chosen control measures and implement the plan;
- e) Review the assessment and update where required.

## First Aid

The OHS Act requires the employer to provide prompt first aid treatment in the case of injury or emergency. First aid aims to:

- Preserve life;
- Prevent the injury or illness from becoming worse;
- Promote recovery.

 *First aid definition: emergency help, using readily available materials, given to a person who is injured or suddenly becomes ill, until professional medical services are available.*

### First aid kits

The General Safety Regulations provide that an employer shall take all reasonable steps that are necessary under the circumstances, to ensure that persons at work receive prompt first aid treatment in case of injury or emergency.

Where more than five employees are employed at a workplace, the employer of such employees shall provide a first aid box or boxes at or near the workplace which shall be available and accessible for the treatment of injured persons at that workplace.

The location of the first aid kit should be clearly indicated with signage, and a staff member should be designated to inspect and manage the contents of the first aid kit.

- Number of first aid kits: The number of first aid boxes in the workplace should be determined by the employer. The practitioner should take into account the nature of the work, types of injuries that are likely to occur, and the number of employees in that particular workplace.
- Contents of first aid box: The minimum contents required in a first aid box are stipulated in the OHS Act, General Safety Regulations. Contents will vary according to the nature of work.

### Minimum contents of a First Aid Box

In the case of shops and offices, the quantities stated under items 1, 8, 9, 10, 14, 15, 17, and 18 may be reduced by half.

Item 1	Wound cleaner / antiseptic (100ml)
Item 2	Swabs for cleaning wounds
Item 3	Cotton wool for padding (100g)
Item 4	Sterile gauze (minimum quantity 10)
Item 5	1 pair of forceps (for splinters)
Item 6	1 pair of scissors (minimum size 100mm)
Item 7	1 set of safety pins
Item 8	4 triangular bandages
Item 9	4 roller bandages (75mm x 5m)
Item 10	4 roller bandages (100mm x 5m)
Item 11	1 roll of elastic adhesive (25mm x 3m)
Item 12	1 non-allergenic adhesive strip (25mm x 3m)
Item 13	1 Packet of adhesive dressing strips (minimum quantity 10 assorted sizes)
Item 14	4 First aid dressing (75mm x 100mm)
Item 15	4 First aid dressings (150mm x 200mm)
Item 16	2 Straight splints
Item 17	2 Pairs large and 2 pairs medium disposable latex gloves
Item 18	2 CPR mouth pieces or similar devices

- First aid register: A First Aid Register (e.g. a small notebook) should be kept with the first aid box. The first aider who attends to the injury should record the following details: date, name of person receiving first aid, brief description of injury/illness, first aid items used, and name of first aider.

### First aiders

The OHS Act requires all workplaces with ten (10) or more employees to have first aiders. A first aider is any person with first aid training who takes charge of an emergency scene and gives first aid.

## INCIDENTS and ACCIDENTS

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Regardless of how we define them, incidents/accidents have unpredictable and harmful results. The employer must investigate the cause and take corrective action to prevent it from happening again.

### Incidents and injuries – what all employees need to know

Practitioners should ensure that employees know all the practice's rules and procedures. This includes guidelines on *who* to contact in the event of an incident or injury. Failure to report as soon as possible implies that you forfeit any right to compensation (COID Act).

Procedures at the practice: procedures to follow in the event of incidents or accident

- i. Any employee calls the practitioner or first aider *[if there is injury]*.
- ii. Any employee informs the Practitioner owner *as soon as possible [injury or non-injury]*.
- iii. Practitioner or practice manager or First Aider call emergency medical services\* if required *[if injury]*.
- iv. Practitioner owner initiates incident recording, reporting and investigation *[injury or non-injury]*
- v. Practitioner owner ensures recording and investigation of incident *[injury or non-injury]*.
- vi. If necessary, the practitioner owner ensures COID documentation is completed and sent to DoL Compensation Commissioner *[if injury]*;

### Emergency medical services:

Practitioner to ensure Emergency Contact Numbers – which provides a list of emergency numbers, including emergency medical services are available to all staff by placing it in a prominent and accessible place.

### Section 24 incidents: report to Dept of Labour

Serious incidents/accidents are addressed in section 24 of the OHS Act. These include incidents where the affected person required medical treatment other than first aid, and certain types of near miss incidents.

The OHS Act categorises section 24 incidents as follows:

#### Section 24(a) and (b): injury or ill-health incidents (Injury on Duty)

Such incidents include:

- When a person dies;
- When a person becomes unconscious;
- When a person loses a limb or part of a limb;
- When a person is injured/becomes ill, or is likely to die or suffer permanent physical defect;
- When a person is unable to work for 14 days or longer;
- When a 'major incident'/disaster occurs. \*

\* A 'major incident'/disaster is defined by the OHS Act as: "an occurrence of catastrophic proportions, resulting from the use of plant or machinery, or from activities at a work place".

#### Section 24(c): near miss incidents

The OHS Act defines a near miss as "any unforeseen event involving one or more hazardous substances which, but for mitigating effects, actions or systems, could have escalated to a major incident". Such incidents involve property damage but no personal injury, where:

- The health or safety of any person was endangered;
- and
- A dangerous substance was spilled;
- There was an uncontrolled release of any substance under pressure;
- Machinery ran out of control;
- There were flying, falling or uncontrolled moving objects.



Section 24 incidents must be reported by the employer to the Department of Labour (DoL) Provincial Director within seven (7) days. If not, the employer will be guilty of a criminal offence and will have to pay a penalty.

## Recording section 24 incidents

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Findings of the investigation must be recorded within seven (7) days on the Incident Form prescribed.

## Recording non-employee incidents/accidents:

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The provincial director must be notified if there is an incident involving a non-employee – as prescribed by the OHS Act General Administrative Regulation 8(3) – including the following information:

- Name of injured person;
- Address;
- Name of employer/entity;
- Address;
- Phone number;
- Name of a contact person;
- Names of witnesses;
- Details of the incident, including:
  - What happened;
  - Place where it happened;
  - Date and time when it happened;
  - How it happened;
  - Why it happened.

## Minor incidents: report internally

A minor or non-disabling injury incident involves personal injury that requires some form of treatment, but does not result in disability (temporary or permanent), and no workdays are lost. The affected person may need to stop working for a short time, e.g. to receive first aid.

### Recording minor incidents

The following serve as records:

- The official Recording & Investigation of Incident form is the recommended form of record-keeping, as it complies with the OHS Act.
- First aid register: include date, name of injured employee, nature of injury, first aid items used, and name of first aider, when recording details of first aid given for minor injuries.
- Medical records: where medical treatment was given by a professional medical practitioner.

## Investigating incidents and injuries

Incident investigation is recognised as best practice – it helps the employer find out what happened, who was affected, where, when, how and why it happened.

Armed with this knowledge, appropriate steps can be taken to prevent an (even more serious) incident in future. The employer must, as far as reasonably practicable, implement the necessary actions to prevent such an incident occurring again.

### Considerations for investigations:

Any incident should be investigated as soon as possible; details can be lost or forgotten! The person conducting the investigation may be the practitioner or a person appointed by the practitioner owner.

The investigator should:

- Secure the scene (to preserve evidence of what caused the incident, and also to prevent any additional injuries);
- Take note of physical evidence;
- Take note of eyewitness accounts;
- Conduct interviews with affected persons;

- Build up a consistent account of the incident.

## FIRE SAFETY

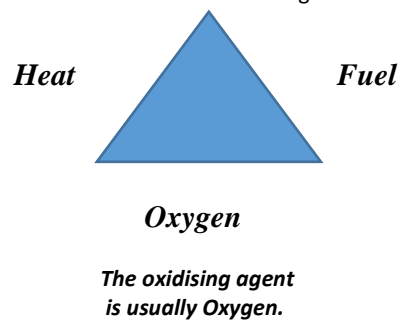
It is important to focus on workplace fire prevention, as well as being prepared for the unexpected: having an emergency action plan.

### Causes and prevention of fire

Fire is a kind of chemical reaction, involving three major components – illustrated as the three sides of a triangle.

### Chemistry of fire and spread

A fire needs fuel + oxygen + heat to start, and to keep burning. It is a kind of chemical reaction, involving these three major components – illustrated as the three sides of a triangle.



The heat of a fire spreads through:

- Direct flame – e.g. burning match or wind-driven firebrand from bush fire.
- Conduction – movement of heat through solid matter, e.g. steel.
- Radiation – heat given off by an object without direct contact, e.g. an electric heater.
- Convection – movement of heat through the air.

The fuel may be:

- Combustible solids – e.g. paper, wood, fabrics, plastic, rubber, coal.
- Flammable liquids – e.g. oil, paraffin, spirits, petrol.
- Flammable gases – e.g. LPG, l f d

### Knowing the type of fire

If you know the type of fire you are dealing with, it helps you decide how best to control it. Fires are classed according to the type of material that is burning – most commonly: A (solid organic), B (flammable liquid/gas), C (electrical), or D (metal).

CLASS OF FIRE	MOST SUITABLE extinguisher	OTHER suitable extinguishers
A (solid organic materials): solid materials such as wood, paper, coal, plastic and fabrics.	Water: has a cooling effect, but can conduct electricity. Fire hose reels rely on a functioning municipal water supply. Mostly used in stockrooms, schools, offices, etc. Only use to fight class A.	Foam: floats on flammable liquids to tame the fire and helps prevent re-ignition. To clean up the affected area, it must be washed away and left to evaporate. Mostly used in garages, homes, vehicles, workshops, etc. Can be used to fight class A & B. Dry powder
B (flammable liquid/gas): oil, petrol, paraffin, spirits, benzene.	Dry powder/DCP: is a multipurpose dry chemical extinguisher, filled with a yellow powder, mono ammonium phosphate, which smothers the fire and absorbs some of the heat. Non-conductive but mildly corrosive if moisture is present, so proper clean-up is essential. Mostly used in schools, general offices, hospitals, homes, etc. Can be used to fight class A, B, C & D.	Fire blanket: is made of fire-retardant material such as fibreglass or wool. The blanket is placed over the fire to cut off the supply of oxygen to the fire. Mostly used in kitchens and laboratories. Carbon dioxide Foam Do not use water!

<p>C (electrical): involving contact with live electrical installations, e.g. short-circuiting machinery and overloaded electrical cables.</p>	<p>Carbon dioxide: CO<sub>2</sub> displaces O<sub>2</sub> (oxygen) and smothers the fire. It has limited cooling power. Environmentally friendly. Leaves no residue, so clean-up is not needed. Mostly used where contamination is to be avoided, e.g. kitchens, computer rooms, laboratories, etc. Not very effective on class A fires (only temporarily displaces oxygen). Can be used to fight class B &amp; C.</p>	<p>Dry powder Do not use water!</p>
<p>D (metal): involving combustible metals, e.g. magnesium &amp; titanium (used in lightweight equipment), aluminium (in some pots and pans, etc) – mostly in the presence of sawdust, machine shavings &amp; other metal shavings.</p>	<p>Dry powder or special extinguisher approved for use on combustible metals.</p>	<p>Do not use water (or other common fire-fighting materials), as it can 'excite' combustible metal fires and make them worse.</p>

## Action in the event of fire

### Response to fire

If you see a fire, no matter how small, you must immediately alert the local fire department, as they have trained and equipped professionals who can deal with it. Fires spread and get out of control very quickly! Think of the four golden rules:

*In the event of a fire or other emergency, remember four golden rules:*

- Alarm:** Raise the alarm to alert others – siren/whistle /panic button/air horn/shout “Fire, get out!”
- Emergency Services:** Call no matter how small.  
Save these numbers on your cell phone:  
! Fire Department Emergency \_\_\_\_\_  
! Ambulance & Paramedic \_\_\_\_\_
- Extinguish:** Only try to extinguish if safe to do so.
- Evacuate:** Everyone must get out. Crawl, if necessary, to avoid smoke/heat suffocation.  
! Help people with disabilities.  
! Close windows and doors if you can.  
! Don't take risks: do NOT use lifts; do NOT open closed doors (there may be fire in the room); do NOT go back inside – until instructed by Fire Officer or Emergency Coordinator.  
! Meet at your Assembly Point for roll call.

## Fire-related resources

### Fire alarms

It is vital to have a distinctive and recognized system for signalling to all employees that they should evacuate the workplace, or carry out other actions as per the emergency plan.

If there is no automatic alarm, the practitioner must ensure that there is some way of warning occupants if their lives are in danger such as using anything that makes a loud noise, e.g. referee's whistle, hand bell, megaphone with siren, air horn, break-glass box, etc. Until such time as a building has an automatic alarm installed, a manually set off device is better than nothing.

If you are practising in a building, find out from your landlord who is responsible for installing and maintaining fire alarms.

### Escape routes and fire exits

Every person at the practice is responsible for adhering to the rules by keeping escape routes and exits clear of furniture, boxes and other items.

- Exit doors: Must be kept clear of obstructions, and should open with one single movement.
- Escape routes: Should be clearly marked and kept clear, so that occupants can get out quickly and safely.

Also:

- Emergency lighting (independent of mains): Should be provided along all escape routes and at all exit doors – Electrical section.
- Signage (white lettering – minimum of 75 mm in height – on a red background): should be in place to indicate escape routes and exits – Signage section.
- Fire escapes: External fire escapes (stairs or ladders) may be required in some cases (large buildings with only 1 internal stairwell).

## Personal protective equipment (PPE)

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PPE is equipment that will protect the user or wearer against any health or safety risks at work.

PPE includes items like safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses, as well as respiratory protective equipment (RPE).

PPE is used in a wide range of jobs and industries, and the type of PPE changes according to the user's working conditions and regulations.

### Why is PPE important?

PPE reduces the risk of injury or harm to users caused by hazards present in the workplace. In a dental practice one would have to determine what the risks are and how it can be prevented by providing the necessary PPE.

To make the workplace safe include the provision of instructions, procedures, training and supervision to encourage people to work safely and responsibly. However, even when these measures have been applied, hazards still remain in the workplace and PPE is ultimately used to minimize the risk of injury.

Risk in the workplace can include injuries to the lungs (from breathing in contaminated air), the head and feet, (from falling materials), the eyes (from flying particles or splashes of corrosive liquids), the skin (from contact with corrosive materials and the body (from extremes of heat or cold). There are many other examples of hazards in the workplace, for example, slipping on a wet floor and cutting your hands on sharp edges.

### Types of PPE

#### Eye protection

Eye protection can protect you from chemical or metal pieces, dust, gas and vapour and, even, radiation. Select the correct eye protection for your requirements and fits correctly.

The types of eye protection are examples: Safety spectacles, goggles, face screens, face shields and visors.

#### Ear protection

The main hazard to ears is, unsurprisingly, noise and PPE like earplugs, earmuffs and semi-insert/ canal caps can provide the necessary protection.

#### Hand and arm protection

According to the HSE, hands and arms can be at risk of abrasion, temperature extremes, cuts and punctures, impact, chemicals, electric shock, radiation, vibration, biological agents and prolonged immersion in water. Gloves with a cuff combined with sleeves that covers all, or part of, the arm can offer effective PPE.

#### Feet and legs protection

Where necessary safety boots and shoes with protective toecaps and are penetration-resistant, boots as well as other types of safety footwear can offer effective protection for your feet and legs. It is important that the appropriate footwear is selected for the risks in each workplace. Lung protection

Respiratory protective equipment (RPE) can offer protection for the lungs. If your work poses risks to your lungs and you would like to find out more, you can contact an inspector.

## COVID-19 & PPE

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The "SADA Dental Protocol in response to the COVID-19 pandemic" of May 2020 must be read in conjunction with this guideline, which provides detailed and comprehensive information on issues such as preparation of the office, instructions for patient prior to visiting the facility, oral health care facility preparation, sterilisation and infection protocols and a dedicated chapter on PPE. Members are encouraged to familiarise themselves with these guidelines.

## Hazardous substances

The employer is responsible for limiting the amount of hazardous chemical substances or biological agents which may contaminate the working environment. At Rhodes University, there are systems in place for responsible disposal of hazardous waste such as:

- Hazardous biological waste
- Hazardous chemicals
- Toxic solvents & paint
- E-waste
- Fluorescent light bulbs



- Computers
- Cell phones
- Batteries
- Printing cartridges
- Sharps



## Gas and vessels under pressure

Work with vessels under pressure can be hazardous, for example, there might be an uncontrolled release of a substance under pressure, which could cause an injury. The employer must comply with the Pressure Equipment Regulations, and also the South African National Standards – which provide requirements for handling, storing and maintaining LPG (liquefied petroleum gas).

### Signage

According to the South African Bureau of Standards, the following system applies to safety signage:

<b>INFORMATION – general:</b> WHITE symbol/writing on GREEN (emerald) background. Example: direction to emergency exit.	
<b>INFORMATION – fire-fighting:</b> RED symbol on WHITE background. Example: fire hose reel.	
<b>WARNING:</b> BLACK symbol on YELLOW (gold) background. Example: fire hazard.	
<b>PROHIBITORY (don't):</b> BLACK symbol on WHITE background with RED border or oblique. Example: no smoking.	
<b>MANDATORY (do):</b> WHITE symbol on dark BLUE (ultramarine) background. Example: safety shoes must be worn.	

## Electrical machinery

Machines and electricity can cause severe injuries. For example, machinery and equipment should be operated in a designated area and machine guards should be in place, and portable electrical equipment should be unplugged when being cleaned or repaired.

## Smoking in the workplace

Cigarettes and butts are a health and safety hazard - they contain toxic and non-biodegradable materials which can remain in the environment for up to 10 years, and they can start runaway fires.

Both the OHS Act and the Tobacco Products Control Act apply at dental practices, and all staff, patients and visitors should note:

- Smoking is not permitted inside any practice premises or building or partially enclosed public space - including walkways, corridors, lobbies, stairwells, elevators, toilets, cafeterias, verandas, courtyards, partially enclosed gardens, covered patios and parking lots, vehicles controlled by the practitioner, and any other common area frequented by persons.
- Smoking outside should be at sufficient distance from any window, entrance or air inlet – not closer than 10 metres – and situated so that no smoke drifts into any building, or into an area where a non-smoker is present.
- Safely dispose of extinguished cigarettes into designated bins.

Rights of Non-smokers: Non-smokers have a right to not be forced to breathe second-hand smoke. It is a human right, in the interests of the common good and public health.

## SAFEGUARDING THE WORKPLACE FROM COVID-19

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On the 5 March 2020, the then Health Minister confirmed South Africa's first positive case of the coronavirus disease (COVID-19).

Covid-19 is a highly-transmittable virus that spreads through respiratory droplets produced when an infected person coughs or sneezes and between people in close contact. Countries already infected have discouraged or prohibited collective gatherings at venues such as movie theatres, schools, universities and even places of worship.

As COVID-19 continues to spread, it is imperative that South African employers and their employees work together to safeguard their health and safety.

### Legal obligations of employers

As stated above, Section 8 of the OHS Act requires every employer to provide and maintain, as far as reasonably practicable, a working environment that is safe and without risks to the health of its employees.

Within the context of Covid-19, there is a clear obligation on the practitioner to manage the risk of contamination in the workplace. Practically, the practitioner can ensure a healthy working environment by ensuring that the workplace is clean and hygienic, promoting regular hand-washing by employees, promoting good respiratory hygiene by employees and keeping employees informed on developments related to Covid-19.

### Code of Good Practice: Managing Exposure to SARS-COV-2 in the Workplace, 2022 ("the Code")

Although the State of Disaster was lifted on 5 April 2022, Covid-19 is likely to linger for a while. So, what does the future hold with regard to the wearing of masks, social distancing, vaccination and other protective measures in the workplace?

The Minister of Employment and Labour has published a Code of Good Practice: Managing Exposure to SARS-COV-2 in the Workplace, 2022 ("the Code") in terms of the Labour Relations Act. The Code has replaced the regulations issued in terms of the Disaster Management Act, i.e., the Consolidated Direction of 11 June 2021 ("the Direction").

The Code came into immediately when the National State of Disaster was lifted (i.e. on 5 April 2022).

### Key points of the Code

The Code generally mirrors the provisions in terms of the Direction but it does contain some new aspects and emphasise new obligations.

This is a summary of key points from the Code (novel aspects that are noteworthy have been highlighted in green):

1. Employers must undertake a risk assessment to give effect to its obligations in terms of the Occupational Health and Safety Act of 1993 as well as the Regulations for Hazardous Biological Agents of 2022 (Covid-19 has recently been listed as a "hazardous biological agent").
2. Employers must develop a plan or amend its existing plan to limit infection and transmission and to mitigate the risks of serious illness or death on the basis of that risk assessment.
3. The risk assessment and plan must include –
  - 3.1. the identification of employees who need to be vaccinated;
  - 3.2. reporting of symptoms and isolation of employees;
  - 3.3. protective measures, such as the wearing of masks and ventilation;
  - 3.4. a procedure to resolve disputes if employees refuse to work because of safety concerns; the process by which these obligations will be complied with.
4. The Code mentions certain measures that may be included in the risk assessment and plan, e.g., social distancing, minimising the number of employees (e.g., through rotation, staggered working hours, shift and remote working arrangements); wearing of masks; sanitising; special measures for vulnerable employees, etc. (These are not obligatory in all circumstances, but may be necessary in some cases.)
5. Employees must be notified of the contents of the Code, the plan and how it will be implemented.



6. Employees must be provided with information relating to the virus, its transmission, the obligations of employees, etc. (similar to what is contained in the Direction).
7. Employers must determine the vaccination status of their employees.
8. Employers must require employees to immediately report symptoms, in which case employees may be required to be tested before being permitted to return to work.
9. Employees who have been diagnosed with Covid-19 must isolate themselves for the period as recommended by the NDOH (The recommended period of isolation may change).
10. With Covid-19 having been listed as a “hazardous biological agent”, employers have to adhere to certain requirements regarding ventilation.
11. Employers are required to regularly check the websites of the NDOH, NICD and NIOH whether any specialised personal protective equipment is required or recommended based on the nature of the workplace or the nature of a worker's duties and the associated level of risk.
12. On the issue of vaccination, the Code's provisions are similar to that of the Direction, except for the following differences:
  - 12.1. Employees may be required to disclose their vaccination status and to produce vaccination certificates.
  - 12.2. An employee who has a valid objection to vaccination on medical grounds, must be accommodated in a position that does not require the employee to be vaccinated.
  - 12.3. The Code makes no reference to the right of employees to object to vaccination on constitutional grounds.
  - 12.4. If an employee refuses to be vaccinated (on grounds other than medical grounds), the employer must counsel the employee and take steps to reasonably accommodate the employee in a position that does not require the employee to be vaccinated,
  - 12.5. The Code specifically mentions that employees are obliged to comply with the employer's plan as it pertains to vaccination (intervals between vaccinations and dates by which employees must be fully vaccinated), and other protective measures.

## Vaccination Mandates

There is now a clear legislative basis for employers to require employees who perform certain jobs to be vaccinated.

If an employee refuses to be vaccinated on valid medical grounds, the employer must accommodate the employee in a position that does not require the employee to be vaccinated. (Presumably there are situations where this is not possible and where it would nevertheless be fair to terminate of employment on the basis of incapacity or operational requirements, depending on the particular circumstances).

Employees who refuse to be vaccinated on other grounds (e.g., personal, political or religious beliefs) should be “reasonably accommodated”. This includes modification or adjustment to a job or to the working environment that will allow an employee who fails or refuses to be vaccinated to remain in employment.

In this regard the Code incorporates the relevant portions of the Code of Good Practice: Employment of People with Disabilities published in terms of the Employment Equity Act. One can, however, imagine situations where employment may be terminated on the basis of incapacity or operational requirements.

The fact that employees are obliged to comply with the employer's plan, including dates by which employees must be fully vaccinated, suggests that employees who fail to comply may be disciplined and even dismissed for misconduct in exceptional situations.

While employers who wish to make vaccination mandatory for some or all of their employees, may be emboldened by the Code as well as the outcome of recent CCMA and Labour Court awards in favour of employers who have dismissed employees who refused to be vaccinated, caution is advised.

Although there may be various grounds for the dismissal of employees who are not vaccinated, special care should be taken that they are treated fairly (in terms of both substance and procedure).

Relevant factors to take into account include an employee's reasons for refusing to be vaccinated, the nature of the job, risk of the spread of the disease, risk of serious illness and possible alternative measures short of dismissal (i.e., “reasonable accommodation”).

Circumstances may differ vastly from one case to the next. Dismissal should be a measure of last resort.

## Small employers

The provisions that apply to small employers (with 20 or fewer employees) are broadly similar to those applicable to larger employers, but are less stringent e.g., with regard to the formality of the requirements surrounding the risk assessment and plan, providing employees with information in relation to the virus, personal protective equipment and ventilation.

However, it is notable that small employers who require employees to be vaccinated have the same obligations as larger employers when it comes to dealing with employees who refuse to be vaccinated.

### **Refusal to work**

Employees may refuse to work if they have reasonable justification to believe that there is an imminent or serious threat to be infected by Covid-19. If internal attempts to resolve issues surrounding a refusal to work fail, the employer has to notify an inspector of the Department of Employment and Labour to intervene. The Code contains measures that protect employees in these circumstances.

### **What should employers do?**

- Employers are encouraged to do the following without delay:
- conduct a risk assessment or update their existing risk assessment; and
- develop a plan or amend its existing plan.

As we have witnessed in South Africa and across the world, the prevalence of Covid-19 and its variants, the rate of infection and the severity of symptoms, are continuously changing. The appropriate response to the virus in the workplace could therefore change rapidly. Any plan or policy should be flexible in order to anticipate and accommodate such changes.

## **Hazardous Biological Agents Regulations**

The Minister of Employment and Labour (“The Minister”) published the Hazardous Biological Agents (“HBA”) Regulations (“Regulations”) on 16 March 2022 in terms of section 43 of the Occupational Health and Safety Act, 85 of 1993 (“OHSA”). The Regulations concern all forms of HBA. This would include, amongst others, SARS-CoV-2 (“COVID-19”).

The Regulations are to be read in conjunction with the Code of Practice: Managing Exposure to SARS-COV-2 in the Workplace (“Code”) which became effective upon the termination of the national state of disaster on 4 April 2022.

### **Application of the Regulations “HBA”**

The Regulations list COVID-19 as a Group 3 HBA. A Group 3 HBA is defined as an HBA that “may cause severe human disease, which presents a serious hazard to exposed persons and which may present a risk of spreading to the community, but for which effective prophylaxis and treatment is available”.

The Regulations apply to every employer or self-employed person at a workplace where exposure to COVID-19 may occur. The Regulations contemplate reasonably practicable steps that can be taken on the part of an employer to control the exposure to an HBA in a workplace.

Overall, the regulations place a number of legal duties on the employer which include amongst other things the duty to:

- Provide information, training and instruction to its employees on the risks of the HBA and the precautions to be taken;
- Ensure that a risk assessment is conducted and documented by a competent person;
- Develop an action plan for the implementation of the recommendations identified in the risk assessment and to inform all employees, the relevant health and safety representative and health and safety committee of the results of the risk assessment, and invite comments on such results;
- Establish and maintain an exposure monitoring program;
- Establish and maintain a documented system of medical surveillance that is overseen by an occupational health practitioner;
- Keep records, including the retention of a risk assessment for a minimum period of 40 years; and
- Prevent and control the exposure to the HBA in the workplace, which includes, where reasonably practicable, making available effective vaccines for those employees who are not immune to the biological agent to which they are exposed or could be exposed.

Any person who contravenes or fails to comply with these obligations will be guilty of an offence, and liable on conviction to a fine or to imprisonment for a period not exceeding 12 months. Duties of persons who might be exposed to HBAs.

# Compensation for Occupational Injuries and Diseases Act, 1993 (COIDA)

The Compensation for Occupational Injuries and Diseases Act, 1993 (COIDA) protects the employer from delictual liability in respect of employees who contract an illness during the course and scope of her/ his employment. An employee who contracts an occupational disease can claim from the Compensation Fund without having to prove the employer's negligence.

However, if the employer was in fact negligent, the employee may receive increased compensation and the cost of such increased compensation may be passed on to the employer in the form of increased assessment rates.

COIDA also only protects employers against claims arising out of injuries or diseases contracted by their employees in the course and scope of employment. Customers or clients who contract a disease due to their interaction with the workplace would have to institute a civil claim, and the normal delictual principles will apply.

Employers will need to strike the correct balance in implementing measures that are appropriate for managing the health and safety of the workplace. Covid-19 has officially reached South Africa and employers and employees should be prepared by fully understanding their obligations to protect themselves and others from exposure and prevent further infection.

## **COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT: COMPENSATION FOR OCCUPATIONALLY-ACQUIRED NOVEL CORONAVIRUS DISEASE (COVID-19)**

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Dentists (carrying out procedures generating aerosol) are regarded as falling in the very high-risk occupation with a high risk of exposure to COVID-19.

### **Benefits**

Assessment of permanent impairment is determined three months after diagnosis and Maximum Medical Improvement is reached.

### **Payment for temporary total disability**

Payment for temporary total disability shall be made for as long as disablement continues but not exceeding a period of 30 days.

### **Suspected and Unconfirmed Cases**

For self-quarantine recommended by a medical practitioner, the employer is liable for remuneration for days of absence.

### **Confirmed Cases**

For confirmed cases where the Compensation Fund accepted liability, temporary total disablement will be paid from date of diagnosis up to 30 days, and for complications the Commissioner will review payment.

### **Permanent Disablement**

Where there are complications, the Commissioner has right to assess each case and determine if there is permanent disability.

### **Medical Aid**

In all accepted cases of COVID-19, medical aid will be provided for not more than 30 days from date of diagnosis.

### **Death Benefits**

Reasonable burial expenses, widow's and dependent's pensions shall be payable, if an employee dies as a result of complications of COVID-19.

# Radiation Control

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In South Africa, the overall regulation of electronic products fell under the control of the directorate for Radiation Control within the National Department of Health (DoH). The national Department of Health initially had a specific division that deals with the regulation of radiation products, the Directorate Radiation Control.

The South African Health Products Regulatory Authority (SAHPRA) assumed the roles of both the Medicines Control Council (MCC) as well as the Directorate of Radiation Control (DRC) which were housed at the National Department of Health (NDoH). Subsequently, SAHPRA was constituted as an independent entity that reports to the National Minister of Health through its Board.

The South African Health Products Regulatory Authority (SAHPRA) which is an entity of the National Department of Health, created by the South African Government to ensure that the health and well-being of human and animal health is at its core.

The legislative mandates of SAHPRA are derived from the Constitution; the National Health Act, 2003 (Act No. 61 of 2003); the Medicines and Related Substances Act, 1965 (Act No. 101 of 1965), as amended (hereinafter referred to as “the Medicines Act”); and other relevant legislation, regulations and policies.

Further, SAHPRA’s mandate has expanded to include the regulation and control of radiation emitting devices and radioactive nuclides under the Medicines Act and the Hazardous Substances Act, 1973 (Act No. 15 of 1973).

## Legislation

The Hazardous Substance Act of 1973, is the most important legislative document providing the framework for hazardous substance control. It ensures the issuing of licenses, appointment of inspectors or inspection of bodies.

Radiation Control receives its regulatory mandate through the Hazardous Substances Act (15 of 1973), which classifies electronic generators of ionizing radiation as Group III hazardous substances, and radioactive sources as Group IV hazardous substances.

Section 3 of the Act controls the sale, letting, use, operation, application, and installation of Group III substances. These are further regulated by Regulation R1332 of 1973.

## Introduction

Licensed dentists play an important role in maintaining radiation exposures of patients and staff as low as reasonably achievable (ALARA). Greater numbers of intra-oral radiographs are being requested and a wide range of other dental radiographic examinations (panoramic, cephalometric) are being performed on a routine basis with the addition of advanced imaging modalities (CBCT).

Individuals who operate dental X-ray equipment must have a basic knowledge of the inherent health risks associated with radiation and must have demonstrated familiarity with basic rules of radiation safety. Digital imaging with photostimulable phosphor plates or solid-state image receptors (i.e., CCD or CMOS receptors) forego the need for darkroom processing of film.

However, quality assurance on maintenance of the receptors, phosphor plate scanners, computers and monitors take on more importance in the management of images acquired with x-radiation. Faulty management of digital data could possibly necessitate remake exposures thus violating the ALARA principle.

What are appropriate exposure levels for dental radiographs? The answer must come from dentists who must evaluate exposure levels used in their facilities and compare these exposure levels to values “generally accepted” as providing diagnostic quality images without overexposure to patients.

The aim of radiation safety is to minimize the potential harmful effects of radiation to patients, dental personnel and the general public.

Although effective doses in dental radiology are relatively low, it is essential not to subject patients unnecessarily to radiography, and to protect them from excessive radiation exposure during examinations.

Reduction of the dose involved in a particular examination to the lowest achievable without compromising diagnostic quality is important.

The purpose of the dental radiographic examination is to aid the clinical evaluation and treatment of a patient. It is considered to be bad practice to obtain radiographic information before the clinical examination has been performed.

When recent radiographs are available, additional diagnostic radiographic procedures should be avoided and previous radiographs retrieved. The number of radiographs should generally be kept to the minimum necessary for obtaining relevant clinical information.

Radiographic examinations directly associated with dental disease, periodic dental examinations and examinations for occupational, medico-legal or insurance purposes have no set dose limits. The radiation worker is responsible for the number and type of radiographs, and should have an adequate knowledge of the properties and biological effects of ionizing radiation.

## Licensed Dentist Responsibilities

### General Responsibilities

Each licensed dentist must take all precautions necessary to provide reasonably adequate protection to the life, health, and safety of all individuals subject to exposure to radiation. This includes judicious prescription of radiographs for individual patients based on selection criteria.

### Specific Responsibilities

#### Licence

The Hazardous Substances Act, 1973 (Act 15 of 1973) does not allow any person to use radiation equipment unless he/she holds a licence under the Act for that purpose.

The Regulations require that a joint product and premises licence be obtained for x-ray equipment before it may be installed and commissioned. Licences are not transferable and are issued to a specific person or institution, for specific equipment and its application, and for a specific premise.

It is the responsibility of the prospective user of an x-ray unit to be in possession of a licence from Radiation Control prior to installation of the unit.

Dental radiation examinations may only be performed by registered:

- dentists,
- radiographers,
- dental therapists, and
- oral hygienists

The practice of utilizing chair assistants to take radiographs on patients is currently not allowed.

The Regulations require that a joint product and premises licence be obtained for X-ray equipment before it may be installed and commissioned. Licences are not transferable and are issued: To a specific person or institution, for specific equipment and its application, and for a specific premise.

It is the responsibility of the prospective user of an x-ray unit to be in possession of a licence from the regulator prior to installation of the unit. Practitioners may be assisted by the supplier of the equipment in this process.

When a new unit is installed, acceptance tests must be performed by the supplier of the x-ray unit and the results recorded on the prescribed form and filed in the Individual Equipment Record (IER) of the unit. The IER is for example, a ring binder containing all the information as prescribed in Table 1 below for each piece of equipment.

## Pre-owned units

The prospective user must ensure that acceptance tests are performed. Granting of a licence to use a unit is subject to submission of the results of the tests to the regulator.

When an existing licenced unit is moved to a new premise (building) or room, prior to use, acceptance tests must be performed on the unit and the results submitted to the regulator.

## New/modified premises

The licence holder must apply for and obtain permission prior to:

- Modification of any licensed premises or layout of equipment on such premises, and/or
- Change of licensed premises (building) or equipment moved to other rooms within the same building.

## Acceptance and routine quality control tests

An Inspection Body (IB) approved by the Department of Health (DoH)/ SANAS must be used to perform all the acceptance tests. The present accredited Inspection Bodies on the SAHPRA website (as at 7 March 2019) are shown in [Table 1](#).

## Acceptance tests

Acceptance tests are the initial tests performed directly after installation and before the equipment is being put into clinical service.

Acceptance tests have three purposes, namely:

- To ensure that the unit meets stated specifications.
- To establish baseline parameters for the future quality control program.
- To familiarize the customer with operation of the unit.

## Quality Control tests (QC)

Some routine tests are required to be carried out by the practitioner as licence holder and others by the appointed Inspection Body. All the quality control tests are performed at the prescribed frequencies as specified in the Table below, the frequency may also be influenced by the age, stability, make, model, etc., of the equipment.

II. TABLE 2 ACCEPTANCE AND ROUTINE QUALITY CONTROL TESTS

II.1. Routine Tests in this section are to be performed by the licence holder or person(s) appointed by the licence holder and Acceptance Tests in this section must be performed by an Inspection Body approved by Department of Health.				
	Physical parameter (required test)	Frequency	Standard	References
<b>II.1.1. General</b>				
1.	Lead rubber aprons	3 monthly	Free from holes or cracks	Ref 2 procedure 11
<b>II.1.2. Extra-oral X-ray tubes with intra-oral image receptors, panoramic radiography and cephalometric radiography</b>				
2.	Indicators, mechanical and other safety checks & warm-up	On acceptance & 3 monthly	Results must be documented at least once every 3 months	Ref 2 procedure 5
3.	Tube Head stability (intraoral x-ray unit)	On acceptance & 3 monthly	The tube does not drift out of position or oscillate	Ref 2 procedure 7
4.	Appropriate technique chart displayed at x-ray unit	6 monthly	Available, applicable and compliant with ALARA principle	
5.	Condition of digital detectors	On acceptance & monthly	No damage to cable or detector or phosphor plate	IPEM 91 DEN07
6.	Evaluation of total image chain ( <b>Image quality</b> ) (film and digital) Images shall be preserved for a period of 36 months. IB must compare results for last 36 months <b>Note:</b> The IB must verify that the licence holder possesses the applicable phantom. If a phantom is not available the test must be reported as <b>FAIL</b> .	On acceptance & monthly  IB every 3 years	No visible deterioration compared with reference image <b>Film &amp; digital - Intra-oral - Use To UniDENT phantom or similar</b> <b>Film - Intra-oral, Panoramic &amp; Cephalometric radiography - Use TOR DEN conventional phantom or similar</b> <b>Digital - Intra-oral, Panoramic &amp; Cephalometric radiography - Use TOR DEN digital phantom or similar</b>	Ref 25
7.	Panoramic radiography reproducibility and uniformity	On acceptance & 3 monthly	No significant visible difference to baseline (professional judgement required)	IPEM 91 DEN10
8.	Panoramic radiography beam alignment and synchronisation of exposure with tube motion	On acceptance & 3 monthly	Edge of beam must be visible on film and detector	IPEM 91 DEN11, Ref 2 procedure 12 & Ref 7 p 6
9.				
10.	Cephalometric radiography - X-ray beam alignment	On acceptance & 3 monthly	Edge of beam must be visible on film and detector	IPEM 91 DEN11, Ref 2 procedure 12 & Ref 7 p 7

## Effects of Radiation

Small amounts of ionizing radiation may accumulate over time and ultimately become a potential health hazard for the patient. Children are therefore much more radiosensitive than adults with the foetus being the most radiosensitive. Genetic effects refer to changes, which do not impact on the health of the exposed person but affect his or her offspring. Low-dose radiation exposure used in dental radiography is not excluded from this long-term complication. Individuals are categorized as to who may be exposed to ionizing radiation by dental X-ray machines into three groups: Patients, radiation workers and the general public.

The principal objectives of radiation control for these groups are the following:

- To minimize the risk of radiation to the patient in dental radiography, commensurate with the required diagnostic information.
- To ensure adequate protection of radiation workers.
- To ensure protection of the public who are not receiving radiation but may be inadvertently exposed.

#### General Requirements

The licensed dentist must:

1. Take all precautions necessary to provide reasonably adequate protection to the health and safety of individuals who are subject to radiation exposure. The main purpose in the control of radiation exposure is to ensure that all exposures are justified in relation to their benefits; those necessary exposures are kept as low as reasonably achievable (ALARA); and that the doses received by patients and personnel are kept well below the allowable limits.
2. Provide radiation safety rules to dental personnel including any restrictions of the operating technique required for the safe use of the particular dental X-ray equipment.
3. Ascertain those dental personnel demonstrate competence in using the X-ray equipment and imaging software, and comply with the radiation safety rules.
4. The equipment and the facilities, in which such equipment is installed and used, meet all applicable radiation safety standards;
5. The equipment is maintained and functions properly;
6. The equipment is used and maintained only by competent and appropriately trained persons / personnel;
7. The appropriate protective clothing, devices and equipment is provided to personnel and properly used;
8. Assure that dental personnel do not stand in the path of the useful beam and must remain behind a protective shield or stand at least six feet (1.8-2m) away from the patient and between 90° - 135° to the direction of the primary beam during an exposure.
9. Make or cause to be made such tests, including quality control (QC) tests are conducted as required by regulation.
10. Provide information to occupationally exposed individuals regarding health protection issues associated with exposure to radiation, precautions or procedures to minimize exposure, and the purpose and function of protective devices employed. These instructions should be given both verbally and in writing.

## OPERATORS

South African law permits only registered dentists, dental therapists, radiographers and oral hygienists to perform radiographic examinations. Dental assistants are not permitted to take radiographs. This guideline is sometimes neglected in a dental practice.

Operators of dental units are conditionally exempted from personal monitoring (wearing of TLD's – Thermo Luminescent Dosimeters).

Operators are required to wear a personal dosimeter (TLD) when:

- (i) the position of the worker during exposures is less than 2 metres
- (ii) the weekly workload exceeds: • 100 intra-oral or • 50 pan/ceph exposures or • pro-rata combination of each type of examination (table 1).

Table 1

Examination	Exposures					
	Intra-oral	100	80	60	40	20
PAN/ceph	0	10	20	30	40	50

The licence holder is responsible to determine whether TLD's must be issued to the persons performing dental examinations.

## Occupational Exposure Requirements

The most prescribed dental x-rays are:

- Bite-wing x-rays which focus on the upper and lower back teeth and check for decay between teeth,
- Periapical x-rays which show the entire length of a tooth from crown to root and is used to look at the health of the bone that supports the teeth and to detect abscesses, cysts, tumors and impacted teeth,
- Occlusal x-rays which show nearly the full arch of teeth in either the upper or lower jaw. These x-rays are used to detect extra teeth, teeth that have not yet broken through, jaw fractures, cleft palate, unusual growths or foreign objects,
- Panoramic x-rays which are a two-dimensional tomographic exam that show the entire mouth in a single image including teeth, jaws, and surrounding tissue,
- Cone beam CT (computed topography) Scan which is a three-dimensional image of the teeth, soft tissues, nerve pathways and bone in a single scan. Commonly used by oral surgeons and orthodontists, the images from a cone beam CT allow for better treatment planning and placement of dental implants.

Radiation is measured in sieverts which indicates the health effect of low levels of ionizing radiation on the human body. Since a Sievert is a very large dose, most measurements are done in millisieverts.

Image	Amount of radiation in millisieverts (mSv)
Bite-wing (2) x-ray	.004 mSv
Periapical (2)x-ray	.004 mSv
Panoramic x-ray	.007 mSv
Cone Beam scan for oral surgery/ortho	.009 mSv
CT scan of head	2.00 xSv
X-ray of an extremity	.001 mSv
CT scan of chest	8.00 mSv
Mammogram (two dimensional)	.700 mSv

The annual exposure limit applies to all occupational doses that an individual receives during the year. If an employee is occupationally exposed to ionizing radiation at more than one facility, each employer has the responsibility to monitor the employee's total occupational exposure to be sure that those dose limits are not exceeded.



## RADIATION PROTECTION

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### Patient Protection

The amount of radiation that the X-ray machine generates and reaches the patient is called “radiation exposure”.

Although the use of leaded aprons and thyroid shields has been recommended, the Directorate Radiation Control has stated that the compulsory use of these protection devices during dental examinations is no longer a requirement. Adequate precaution should, however, be taken to reduce radiation when examinations are performed on women of childbearing capacity and children

Anyone who is in the X-ray room at the time of exposure must be behind a protective barrier. If someone must also be in the room to assist or maintain patient safety, then this individual must wear a protective apron. The apron should be preferably 0.5 mm of lead or lead-equivalent but not less than 0.25 mm of lead or lead-equivalent thickness.

For pregnant patients, it is prudent, that only exposures necessary to obtain clinically relevant information should be taken with the appropriate protection measures in place. Furthermore, radiographic assessment should be delayed until after delivery. It is important to reassure the pregnant patient that she is being exposed to a low dose of radiation. Since a woman of childbearing age may be unaware of her pregnancy in the early stages, precautions to reduce radiation exposure of the embryo should be taken with all radiographic examinations.

The Directorate of Radiation Control requires that the patient’s radiographic information be kept on a file for five years after the date of the last written report. It should contain the name, birth date and gender of the patient as well as the date, type of examination, region and reason for the examination with a short report on the diagnostic information gained. Any repetition of a patient exposure should be indicated in the patient’s file.

### Pregnant Patients

The European Guidelines of Radiation Protection and the American Dental Association state that there is no contraindication for taking a radiograph on a woman who is or may be pregnant but that it must be clinically justified.

Performing dental radiographic examinations in pregnant women in South Africa is not contraindicated, but risks and benefits must be evaluated. A lack of awareness may lead to neglecting radiological diagnostics for pregnant patients when the benefits out-weight the risks.

### Dental Personnel Protection

Dental Personnel may receive radiation from three sources: the primary beam, when standing in its path, stray radiation or radiation leaking from a defective tube head. The most important protective measure is, under all circumstances, to stay as far as possible from the radiation source. They should preferably leave the X-ray room prior to making an exposure. This principle is based on the inverse square law, which states that the intensity of radiation is inversely proportional to the square of the distance from the source of radiation.

Other measures include: safe and functional equipment, correct radiographic techniques and the monitoring of the radiation dose.

Individuals who are occupationally exposed to radiation are not permitted to hold patients or to hold image receptors during exposure; nor shall any individual be regularly used for this service.

During the exposure, dental personnel who perform dental radiography should stand behind a protective barrier. In situations where dental personnel cannot stand behind a protective barrier, they must stand at least 2 meters away from the patient and the X-ray tube, not in the

path of the primary beam but preferably behind a fixed or mobile barrier such as a lead-shielded wall or movable leaded Plexiglass shield. Increase the distance between the patient (the source of scatter radiation) and the X-ray operator to over 2 meters.

The wearing of a dosimeter (Thermo Luminescent Dosimeters – TLDs) is only required when the position of the worker during exposures is less than 2 metres from the tube head or when the weekly workload exceeds 100 intraoral- or 50 pan/ceph exposures or when a pro-rata combination of each type of examination exists.

The intensity of the primary X-ray beam, scatter radiation and leakage from the X-ray tube diminishes rapidly as the distance between the dental X-ray operator and the source of radiation (or the patient) increases.

The degree of beam intensity reduction is related exponentially to the second power of the changes in the distance. If a dental X-ray operator can increase his or her distance from the radiation source by a factor of 2, his or her exposure would be reduced to ¼ of the original amount.

### **Pregnant radiation workers**

Some studies have shown that there is an increased risk of leukaemia and other cancers in children if the expectant mother was exposed to a significant amount of radiation. Women employees must be aware of possible risks so they can take appropriate steps to protect their offspring.

It is strongly suggested that the instruction be given both orally and in writing. Also, each woman employee should be given an opportunity to ask questions, and each woman employee should be asked to acknowledge in writing that the instruction has been received. Further, it would be prudent to keep records of such acknowledgment indefinitely.

According to the California Dental Association, the following facts should be given to the woman employee:

- The first three months of pregnancy are the most important as the embryo-foetus is most sensitive to radiation at this time.
- In most cases of occupational exposure, the actual dose received by the embryo-foetus is less than the dose received by the mother, because some of the dose is absorbed by the mother's body.
- At the present occupational dose equivalent limits, the risk to the unborn baby is considered to be small, but experts disagree on the exact amount of risk.
- There is no need for women to be concerned about sterility or loss of ability to bear children from occupational exposure.

Preventive options for protecting embryo/foetus

- Temporary assignment to tasks which involve less risk of being exposed to radiation.
- Use of protective apron (full size, half-size, wrap-around, or any other protective clothing appropriate to the situation) while actually exposing patients.
- Abiding by the regulatory prohibitions.
- Use of monitoring devices such as a film badge worn at the abdomen.
- Staying out of the X-ray room and behind the protective barrier during exposure.

### **Protection of non-radiation personnel and members of the public**

- a) Members of the public are not allowed to enter controlled areas unsupervised.
- b) Non-radiation personnel or members of the public shall not remain in the x-ray room during any x-ray procedure unless they are required to be in attendance.
- c) Care shall be taken to ensure that the same non-radiation personnel are not always involved. Women who are pregnant shall not be used in this role.

### **Protection of persons holding patients or image receptors**

- a) Dental personnel are responsible for requiring that all individuals unnecessary to the dental radiographic examination leave the X-ray room prior to making an exposure.
- b) Anyone who is in the X-ray room at the time of exposure must be behind a protective barrier. If someone must also be in the room to assist or maintain patient safety, then this individual must wear a protective apron. The apron should be preferably 0.5 mm of lead or lead-equivalent but not less than 0.25 mm of lead or lead-equivalent thickness. Mobile protective barriers or shields should be available for dental personnel protection and should be used as indicated.
- c) No person shall hold a patient, x-ray film cassette, or other imaging equipment or x-ray tube head in position during exposures unless it is otherwise impossible to obtain a diagnostically useful image and not merely that it is a matter of convenience.
- d) Holding of patients or x-ray film cassettes during exposure shall be done by persons accompanying the patient in preference to non-radiation personnel; and by non-radiation personnel in preference to radiation workers. Non-

radiation personnel should be chosen on the basis of a roster, i.e. it shall not be the same person who does the holding. No pregnant women or young persons (under the age of 18) shall do any holding.

- e) Any persons holding patients or film cassettes in position during an x-ray examination shall wear a lead rubber apron and wherever practicable, lead rubber gloves. No part of the holder's body shall be in the primary beam, even if covered with protective clothing.

### Protective clothing

- a) Any person who cannot remain in the protected area during x-ray examinations shall wear a protective apron of at least 0,25mm lead equivalence.
- b) Any person standing within 1 metre of the x-ray tube or patient during fluoroscopy examinations shall wear eye protection (lead glasses), thyroid protection and a protective apron of at least 0.35mm lead equivalent.
- c) Protective gloves shall be at least 0.35mm lead equivalence. (d) Gonad shields shall be at least 0.5mm lead equivalence.
- d) A specially designed lead-impregnated thyroid collar can be used to protect the thyroid gland from excessive and/or unnecessary radiation during intraoral X-ray exposures. It is also highly recommended for panoramic, skull and CBCT exposures if the Velcro straps can be secured and kept out of the way of the primary beam or it does not cover an area of primary interest (e.g., if cervical vertebrae need to be included in an extra-oral image.)
- e) Lead-impregnated leather or vinyl aprons must be used to cover the reproductive organs of all patients who undergo dental X-ray examinations. The ability of the apron material to stop X-rays is measured in "lead-equivalent" thickness, that is equivalent to the same thickness of solid lead. Thus, 0.25 mm of lead-equivalent is equal to 0.25 mm of solid lead. Protective aprons are available which are constructed of a material of 0.5 mm of lead-equivalent and thus provide greater protection to the gonads. The lead-equivalent thickness is stated on a label on the hem of the apron.
- f) Aprons should be evaluated periodically (at least yearly) for tears and cracks. Seriously compromised aprons may have lead sheeting that is bunched up. This can be detected by feeling the lower portion of the apron.
- g) Protective aprons are primarily designed to protect the wearer from scatter radiation. They do not totally protect against the primary X-ray beam to provide enough protection. This is the reason why small beam (rectangular) collimation is preferred. The reduction in exposure resulting from placing 0.25 mm lead-equivalent apron material in a primary X-ray beam of 100 kVp would only be 60% as compared to 0.50 mm lead-equivalent apron that will attenuate the beam by 85%.

### Radiation warning signs, notices and lights at entrances to x-ray rooms

Appropriate radiation warning signs and notices must be displayed and required warning lights in working order:

- a) Fixed units:

A radiation warning sign and warning notice, "X-RAYS - NO UNAUTHORISED ENTRY" must be displayed at all entrances leading to the rooms where x-ray units are installed.

- b) Mobile units:

A radiation warning sign and warning notice, "X-RAYS - NO UNAUTHORISED USE" must be displayed on the control panel of the x-ray units.

### Protective Barriers

Conventional building materials in walls, partitions, floor and ceiling may provide adequate shielding from x-radiation; however, there may be situations where lead shielding would be required due to workload, office design or other circumstances.

It is always useful to obtain the services of a qualified expert. Patients in the waiting room should also be protected and shielded from x-radiation.

Cleaners, persons in the waiting room, passers-by and others should not receive more than 1 mSv full-body radiation dose per year. In order to protect the public, the primary beam or X-ray equipment should not be aimed directly into occupied rooms or corridors and the thickness of the barrier material of partitioning walls should be adequate according to the guidelines of the Directorate of Radiation Control. X-Ray units should be equipped with radiation-warning signs at entrances to all areas containing X-ray units. These must be fixed in a prominent position and should be clearly visible.

## Human Immunodeficiency Virus (HIV)

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Oral health is an integral part of general health and plays a role in the prevention, treatment and care of HIV-infected people. The mouth remains an important indicator of the progression of HIV disease and studies have shown that 60-70% of HIV/AIDS patients will have an oral manifestation of the disease at any one time.

The Health Professions Council of South Africa (HPCSA) ethical rules provide that no dentist may ethically refuse to treat any patient solely on the grounds that the patient is, or may be, HIV seropositive. No dentist may withhold normal standards of treatment from any patient solely on the grounds that the patient is HIV seropositive, unless such variation of treatment is determined to be in the patient's interest and not by perceived potential risk to the oral health care worker.

The dental surgery is an ideal environment for cross infection with pathogens other than HIV including cytomegalovirus, hepatitis B and C viruses, herpes simplex virus types 1 and 2, Mycobacterium Tuberculosis (TB), staphylococci, streptococci, and other viruses and bacteria that colonize or infect the oral cavity and respiratory tract.

The risk of transmitting hepatitis B virus is about 30% per encounter, whereas the transmission of HIV with known contaminated blood is 0.3%

It exposes OHCW and patients to a variety of microorganisms that are transmitted via blood, oral or respiratory secretions. Occupational exposures can occur percutaneously, i.e., through needlesticks or injuries from sharp instruments contaminated with infected blood or through contact of the eye, nose or mouth with infected blood. Cross infection can be from patient to OHCW, from OHCW to patient or from patient to patient.

### Modes of Transmission

HIV is transmitted primarily in 3 ways:

- Sexual (usually heterosexual, by sexual contact with an infected person).
- Perinatal (babies born to HIV-infected women may become infected before or during birth or through breast-feeding after birth).
- Blood-borne (e.g. sharing of equipment, sharing needles and/or syringes (primarily for injecting drug use) with someone who is infected).

Less common modes of transmission include:

- Being "stuck" with an HIV-contaminated needle or other sharp object. This risk pertains mainly to healthcare workers.
- Receiving blood transfusions, blood products, or organ/tissue transplants that are contaminated with HIV. This risk is extremely rare due to the testing of the blood supply and donated organs/tissue.
- Contact between broken skin, wounds, or mucous membranes and HIV-infected blood or blood contaminated body fluids. These reports have also been extremely rare.
- There is an extremely rare chance that HIV could be transmitted during oral sex, "French" or deep, open mouth kissing with an HIV-infected person if the HIV infected person's mouth or gums are bleeding.

Although HIV transmission is possible in healthcare settings, it is extremely rare. Medical experts emphasize that the careful practice of infection control procedures, including universal precautions (i.e. using protective practices and personal protective equipment to prevent transmission of HIV and other blood borne infections), protects patients as well as healthcare providers from possible HIV transmission in medical and dental settings.

The risk of OHCWs being exposed to HIV while at work is very low, especially if they carefully follow universal precautions (i.e., using protective practices and personal protective equipment to prevent HIV and other bloodborne infections). It is important to remember that casual, everyday contact with an HIV-infected person poses no risk to health care workers or anyone else to HIV.

For health care workers on the job, the main risk of HIV transmission is through accidental injuries from needles and other sharp instruments that may be contaminated with the virus; however, even this risk is very small. It has been estimated that the risk of infection from a needle-stick is less than 1 percent, a figure based on the findings of several studies of health care workers who received punctures from HIV-contaminated needles or were otherwise exposed to HIV-contaminated blood.

It is generally accepted that the oral health team is far more at risk from the hepatitis B virus than from HIV.

Table 1: Infectious and non-infectious body fluids	
Infectious body fluids	Non-infectious body fluids
<ul style="list-style-type: none"> <li>• All body fluids containing blood</li> <li>• Vaginal secretions</li> <li>• Semen</li> <li>• Pericardial fluid</li> <li>• Pleural fluid</li> <li>• Cerebrospinal fluid</li> <li>• Amniotic fluid</li> <li>• Peritoneal fluid</li> <li>• Synovial fluid</li> </ul>	<ul style="list-style-type: none"> <li>• Tears</li> <li>• Faeces</li> <li>• Urine</li> <li>• Saliva</li> <li>• Nasal secretions</li> <li>• Sputum</li> <li>• Vomit</li> <li>• Sweat</li> </ul>

Table 2: Risk of Transmission	
Virus	Risk
<ul style="list-style-type: none"> <li>• HIV percutaneous</li> <li>• HIV mucosal exposure</li> <li>• Hepatitis B – eAg negative</li> <li>• Hepatitis B – eAg positive</li> <li>• Hepatitis C</li> </ul>	<ul style="list-style-type: none"> <li>• 0.3%</li> <li>• 0.1%</li> <li>• 2%</li> <li>• 20-40%</li> <li>• 1-10%</li> </ul>

### HIV TESTING IN THE WORKPLACE

Due to the growing prevalence of HIV in society, dentists as employers are experiencing an increasing impact on the workplace. Absenteeism is increasing and speculation about the risks to non-infected persons is rife. Dentists as employers are concerned that the nature of their business is such that an employee infected with HIV could place others at risk of being infected and affect their business.

### Prohibition

1. The Employment Equity Act of 1998 prohibits medical testing of employees, including prospective employees, unless it is permitted by legislation or where it is justifiable on certain specified grounds. The Act further prohibits the testing of an employee for his/her HIV status, unless the Labour Court determines that such testing is justifiable.
2. An employee is under no obligation to disclose his or her HIV status to an employer, any other employee or anyone associated with the organisation.
3. The purpose of these prohibitions and limitations is to prevent employers from discriminating against employees and job applicants on the basis of their medical status.

### Universal precautions [UP]

All patients are to be treated equally in terms of infection control as every patient is seen to be potentially infectious.

Dentists must thus apply the same infection control protocols. UP is designed to protect the health and safety of OHCW and in doing so, also protects the patient.

There is consensus that adherence to universal precautions is one of the most important actions that will significantly protect health care workers against infection by HIV and other bloodborne pathogens. (The exception is immunisation against hepatitis B.)

Universal infection control measures /Standard precautions are the best practices that must be adopted by all oral healthcare workers (OHCW) when potentially coming into contact with any patient's blood, tissue or body fluid.

As a general principle, disposable instruments should only be used once, and re-usable items should be sterilised.

Emphasis should be placed on consistent adherence to recommended infection control strategies, including the use of protective barriers and appropriate methods of sterilisation.

Each dental practice or facility should develop a written protocol for infection control including instrument processing, operatory clean up and management of injuries.

The following are key elements of universal/standard infection control precautions:

- Hand hygiene.
- Personal protective equipment.
- Sharps disposal.
- Waste disposal.
- Blood and body fluid spillage procedure.
- Decontamination of equipment and the environment.
- Autoclave Use.
- Handpiece Sterilisation.
- Personal protection in the form of vaccinations and immunisations.

## Hand Hygiene

Hand decontamination is the most effective means of preventing cross infection. Bacteria and viruses cannot penetrate intact skin. It is vital to maintain skin in a good condition and prevent cracking, chapping and drying of the skin.

The following activities are examples of when hands must be washed using detergent and water:

- Whenever hands are visibly dirty;
- Prior to and following examination of a patient;
- Prior to handling patient equipment;
- On entering and leaving the clinical environment;
- After removal of gloves;
- Following any handling of blood or body fluids;
- After visiting the bathroom;
- After handling hand pieces and instruments;

This is not an exhaustive list.

## Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) consists of aprons, gloves, masks and eye protection.

The primary use of PPE is to protect staff and reduce opportunities for transmission of micro-organisms.

Dentists are responsible for ensuring that staff has access to appropriate PPE. Staff also has a responsibility to use PPE in appropriate situations.

The selection of the PPE is based on a risk of transmission of micro-organisms to the patient and the risk of contamination of the OHCW clothing and skin by the patient's blood and body fluids.

At all times when an OHCW is likely to be splashed in the face with blood or body fluids;

At all times when an OHCW is working in close proximity to a patient who is coughing.

When an OHCW has acne or dermatitis.

During restorative work using a high-speed hand piece for example when preparing a tooth or polishing a crown.

Body fluids dirtying clothes - Wear a plastic apron or gown during procedures where body fluids may dirty clothes.

## Gloves

The use of gloves can reduce the risk of acquiring infection through direct skin contact between OHCW and patients.

- Gloves should not be worn unnecessarily or as a substitute for hand decontamination as prolonged and indiscriminate use may cause adverse reactions and skin sensitivity.
- Gloves are a single use item.
- Gloves can reduce the likelihood of contact dermatitis in staff exposed to chemical agents.
- Gloves must be worn when direct contact with contact with blood, body fluids, non-intact skin or mucus-membranes is anticipated.

- Gloves must be changed between patients and different procedures on the same patient.
- Gloves must be disposed of in a clinical waste bin.
- Hands must be decontaminated with soap and water immediately on removal of gloves.

### **Sterile gloves**

Training on the correct procedure for donning and removing sterile gloves must be provided for staff to prevent the contamination of the outer surface of the glove and the hands.

If OHCW has a latex allergy or sensitivity to specific chemicals in gloves, they must report this to the dentist as alternative gloves must be made available in the person's area of work.

Where a patient is known to be allergic to latex, staff must use non-latex gloves.

### **Disposable aprons and gowns**

Plastic aprons must be worn to reduce the level of contamination of uniforms/clothing where direct patient care is given and there is potential for the dispersal of pathogens.

The type of apron or gown to be worn depends on an assessment of risk of contact with body fluids.

Aprons:

- Must be worn where there is a risk of blood or body fluid contamination of the uniform,
- Must be changed between patients and different procedures on the same patient,
- The apron must be disposed in an orange clinical waste bin. as clinical waste,
- May be worn for decontamination activities, including cleaning and disinfection.

### **Eye protection**

- Mucous membranes of the eyes and mouth must be protected when there is a risk of blood splashes.
- Eye protection may be achieved through the use of goggles, visors or spectacles with side pieces.
- They must be comfortable to wear, fit correctly and allow for clear vision.
- Eye protection that is designed for multi-use must be cleaned with detergent between each task and patient.

### **Masks and respirators**

- Masks are worn to protect the wearer from potential exposure to micro-organisms via splashes of blood or body fluid. In the present COVID-19 pandemic it would include protection and exposure to droplets and contamination.
- The use of a mask must be based on an assessment of risk of body fluid exposure. Staff may select a face mask depending on the level of protection required.
- Where a mask is required, it should be applied prior to entering the surgery area.
- Masks must be worn correctly and be close fitting.
- Handled as little as possible.
- Changed between operations or patients.
- Changed if wet.
- Discarded immediately after removal in an orange clinical waste bin.
- Hands must be washed on removal of mask.

### **Sharps Disposal**

- Use of appropriate PPE.
- Used sharps must be discarded into a sharps container at the point of use. Needles and syringes must not be disassembled by hand prior to disposal.
- Do not re-sheath needles.
- Do not carry loose sharps in your own hands - use a plastic tray.

- Sharps must not be passed directly from hand to hand, use a tray so that the same sharp device is not touched by more than one person.
- Sharps containers must not be filled above the mark indicating they are full.
- Temporary closure mechanisms should be used when sharps boxes are not in use.
- Sharps containers should be located in a safe position.
- Report all incidents (including near misses) involving contaminated sharps at the time of occurrence, or as soon as possible afterwards.

### Disposal of Waste Materials

- In terms of the Code of Practice of the South African Bureau of Standards on the Handling and Disposal of Waste Materials within Health Care Facilities (SABS 0248:1993), health care waste is identified as hazardous waste.
- It is the responsibility of all dentists to have a health care waste management system in place or to have access to such a system.
- Such a system should be provided by an accredited waste service provider and be conducted in accordance with the SABS code 0248:1993.
- Blood, suctioned fluids or other liquid waste may be poured carefully into a drain connected to a sanitary sewer system.
- Disposable needles, scalpels or other sharp items should be placed intact into puncture resistant containers before disposal.
- Solid waste contaminated with blood or other body fluids should be placed in sealed, sturdy impervious bags to prevent leakage of the contained items.
- The independent practitioner should be able to provide demonstrable evidence of compliance with an acceptable protocol for the management of health care waste.
- Such a protocol should provide for an audit trail on the management of waste generated by the practice.
- Sharps bins must be kept separate from other clinical waste and MUST NOT be put into clinical waste bags.

### Blood and body fluid spillage procedure

- For spillages on the floor or a large surface area use PPE, wear gloves and apron.
- Use paper roll to remove the spillage and place in a in an orange clinical waste bag.
- Wash area with detergent and water.
- Dispose of PPE in a clinical waste bin.
- Decontaminate hands using soap and water.

### Decontamination of equipment and the environment

- After treatment of each patient and at the completion of daily work activities, countertops and dental unit surfaces that may have become contaminated with patient material should be cleaned.
- Use PPE, wear gloves and apron.
- Spilled blood - Clean up spilt blood immediately and wipe the surface with disinfectant.
- Wear sturdy utility gloves when cleaning up.
- Covering to be changed with a gloved hand after each patient;
- Rubber dams to be used as appropriate;
- High speed evacuation should be used at all times.
- Surfaces should be disinfected with a suitable chemical germicide.
- Clean the area with detergent and water.
- Surfaces or equipment contaminated with blood should be disinfected with a chlorine-based disinfectant.
- Dispose of waste in a clinical waste bin.
- Dispose of PPE as in a clinical waste bin.
- Decontaminate hands using soap and water.

### Autoclave Use

- The sterilisation of instruments is one the most important infection control precautions in dental practice.
- Sterilisation by heat is superior to any other form of sterilisation.
- Professional Associations recommend flushing of dental unit waterlines each day before work, and before and after each patient.
- Autoclaves must be tested regularly to ensure they are operating efficiently.



- Disinfection of dental impressions and appliances
- All impressions and appliances that need to be sent to the laboratory for processing are required to be adequately disinfected to prevent any cross infection.

### **Hand piece Sterilisation**

Most modern hand pieces make use of ceramic bearings and thus heat-treating hand pieces between each patient should be considered an essential component of standard procedures.

Dentists can autoclave their hand pieces as often as possible as modern hand pieces can withstand the rigours of autoclaving between patients.

### **Hepatitis B Immunisation**

It is recommended that all OHCW who might be exposed to blood or blood-contaminated substances in a dental setting be vaccinated for Hepatitis B.

Check every 5-10 years whether immunity is still protective.

If not, revaccination or a booster vaccination may be required.

## Duties of Oral Healthcare Workers

### Introduction

The SA Constitution grants every person the right to access health care services, the right to equality and to be free from unfair discrimination, the right to freedom and security of person, the right to privacy and to emergency medical treatment.

In terms of the South African Constitution no patient may be refused emergency treatment. This rule binds both private and public health facilities. In the former case, a patient has to be stabilized at least before being transferred to a state facility.

The Health Professions Council of South Africa (HPCSA) Rule 2.4 provides that no health worker can:

- refuse to treat patient solely because the patient is or may be HIV seropositive;
- treat HIV-positive people differently to other patients by withholding normal standards of treatment unless treatment difference is in the patient's interest (e.g. for fear of getting infected with HIV).

Treatment cannot be suboptimal because of a perceived potential risk to health care workers. It is accepted that a health care worker will examine or treat a patient only with the informed consent of the patient.

When managing a HIV patient, the OHCW has a primary responsibility towards the individual patient. OHCW has certain responsibilities to other health care workers, and other persons that might be in danger of contracting the disease from the patient.

OHCW are reminded that an HIV diagnosis, without further examination (such as measuring viral load or CD4 cell counts), provides no information about a person's prognosis or actual state of health.

There is persuasive scientific evidence that knowledge of the HIV status of a patient does not provide additional protection to OHCW treating the patient. Nevertheless, there is a perception amongst some OHCW that under exceptional circumstances, the knowledge of the HIV status of a patient may be useful in order to ensure the use of 'extended' universal precautionary measures such as special gloves, clothing and face masks, and that inexperienced personnel should not be allowed to perform surgery on such patients.

OHCW should realise that there are factors which make it unrealistic to rely on HIV testing of patients to protect themselves against occupational exposure. Thus, OHCW must appreciate the significance of the window period of infectivity; the ever-increasing prevalence of HIV infection, especially among hospital patients; the time and cost it takes to obtain a reliable HIV test result and the need to treat, under less-than-ideal conditions, patients outside hospitals and in emergency care units.

These factors are not under the control of the OHCW and strengthen the view that, to minimise the risk of infection, health care workers should adopt appropriate universal precautions in all clinical situations rather than rely on knowledge of the HIV status of patients.

Where certain well defined high risk or exposure prone procedures are considered, the patient should be informed of the concerns and requested to consent to HIV testing. This should not be used routinely for all patients or patients informed that HIV testing is compulsory.

Patients always retain the right to refuse HIV testing and where it is refused, the patient may not be refused treatment on this basis. Where the patient declines to be tested such patient should be managed as if the patient is HIV positive.

### Oral Healthcare Workers infected with HIV

Although the Bill of Rights in the Constitution and the Employment Equity Act, censure stigma and discrimination, it is still prevalent.

The Employment Equity Act declares that discrimination on the basis of HIV status is unlawful, it also provides exclusion of any person on the basis of an inherent requirement of the job is not unfair discrimination and if the Labour Court deems it justifiable, then testing of an employee to determine HIV status is not prohibited.

This implies that as a consequence of their HIV status, limitations may be placed on employees with regard to the nature of the work they may undertake.

The laws regarding infected practitioners should be driven by science. The same reasons that provide that HIV infected patients have certain rights to treatment, HIV infected health care providers also have certain rights to practice.

No dentist or OHCW is obliged to disclose his or her HIV status to an employer nor may any employee be unfairly discriminated against or dismissed as a result of his or her HIV status. Disclosure of HIV status by an infected practitioner in the climate of fear surrounding AIDS is tantamount to withdrawing from practice.

Rule 11 of the HPCSA guidelines provide that no dentist or OHCW is obliged to disclose his or her HIV status to an employer nor may the employee be unfairly discriminate against or dismissed based on HIV status.

Any OHCW who finds himself or herself to be HIV positive, should be encouraged to seek counselling from an appropriate professional source, preferably one designated for this purpose by a medical academic institution.

Counsellors must of course be familiar with recommendations such as those of the Centres for Disease Control so that unnecessary, onerous, and scientifically unjustifiable restrictions are not placed on the professional activities of an HIV positive dentist.

The benefits of voluntary HIV testing should be explained to all OHCW and they should be encouraged to consider HIV testing.

Infected dentists may continue to practice. However, they must seek and implement the counsellor's advice on the extent to which they should limit or adjust their professional practice in order to protect their patients. The counsellor must make individual risk assessments and decide on a case-by-case basis what practice restrictions, if any, should apply to a particular practitioner.

Universal precautions are an effective and adequate means of preventing the transmission of HIV from OHCW to patient and patient to OHCW.

### **Dentists as Employers**

It must be recognised that the HIV/AIDS epidemic will affect every workplace with possible prolonged staff illness, absenteeism, and death impacting on productivity, employee benefits, occupational health and safety, production costs and workplace morale.

From a business perspective, employees should be encouraged to voluntarily disclose their HIV seropositivity status. This would enable their conditions to be monitored so that the secondary support systems, consisting of superiors, peers and subordinates can assist HIV infected individuals in their tasks and help them to maintain a sense of reality.

However, individuals (including healthcare workers) are under no legal obligation to disclose their HIV status. The way in which employees with HIV or AIDS are treated in the workplace has a multitude of legal obligations.

Employers should be aware of possible liabilities if wrongful action is taken against employees with HIV or AIDS.

The South African Constitution grants all people the right to equality and non-discrimination. It also gives employees the right to be treated fairly at work. The Bill of Rights provides for every person to have the right to fair labour practices.

### **National Health Act**

The National Health Act provides that health establishments must implement measures that minimize injury or damage to the person or property of health care workers.

This means that health care workers must be protected from physical harm, their working environment made safe and free from any hazardous incidents.

Health care workers must be provided with protective clothing against airborne viruses.

If a health care worker accidentally pricks him or herself with a needle containing blood from a person who may be HIV positive, the necessary measures must be taken to ensure that the worker has access to post-exposure prophylaxis (PEP) to reduce the risk of HIV transmissions.

To ensure compliance with these policies by health establishments the National Health Act establishes an Inspectorate for Health Establishments. The provisions of the National Health Act should be read with the Occupational Health and Safety Act and labour legislation governing working conditions.

## Employment Equity Act (EEA)

The EEA was the first law to directly provide those employers may not unfairly discriminate against employees because of their HIV status. It is the only legislation that specifically refers to HIV/AIDS.

EEA aims at ensuring equality and non-discrimination in the workplace through anti-discrimination measures and affirmative action. It also provides specific provisions regarding HIV/AIDS.

A person's HIV status is something private. It has nothing to do with their work and employees are under no legal duty to tell their employer whether they are HIV negative or positive.

Any information employees share with their employers about their HIV status may only be disclosed to other people with consent. Telling other employees without an employee's consent is a breach of confidentiality and it could mean the employer is liable for damages.

Any dentist who tells a patient's employer about their HIV status without their consent or knowledge is acting against the law.

The EEA provides that an employer may not force an employee to take an HIV test except in certain circumstances.

Making employees undergo HIV tests is expressly prohibited, unless deemed justifiable by the Labour Court. An employer cannot force a job applicant to have an HIV test. Practitioners that do this are acting unlawfully.

If an employer wants to test employees for HIV and the employer thinks that HIV testing may be important and reasonable for whatever reason, the employer must ask the Labour Court to allow for HIV testing. The Labour Court will then have to decide whether HIV testing is justified in the employer's workplace.

Basically, employees with HIV/AIDS must be treated in exactly the same manner as other employees with life threatening illnesses.

## Dentists as Employers

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### Testing Employees

In terms of the EEA Authorised testing Permissible testing Employers must approach the Labour Court for HIV testing.

An employer may provide testing to an employee who has requested a test in the following circumstances:

- i. during an application for employment;
- ii. as a condition of employment;
- iii. during procedures related to termination of employment;
- iv. as an eligibility requirement for training or staff development programmes; and
- v. as an access requirement to obtain employee benefits.
- vi. As part of a health care service provided in the workplace;
- vii. In the event of an occupational accident carrying a risk of exposure to blood or other body fluids;
- viii. For the purposes of applying for compensation following an occupational accident involving a risk of exposure to blood or other body fluids.

Furthermore, such testing may only take place within the following defined conditions:

- i. At the initiative of an employee;
- ii. Within a health care worker and employee-patient relationship;

iii. With informed consent and pre and post-test counselling, as defined by the Department of Health's National Policy on Testing for HIV; and

iv. With strict procedures relating to confidentiality of an employee's HIV status as described in section 6 of this Code.

Labour Relations Act (No.66 of 1995) In accordance with Section 187(1)(1. f) of the Labour Relations Act, No. 66 of 1995, an employee with HIV/AIDS may not be dismissed simply because he or she is HIV positive or has AIDS. However where there are valid reasons related to their capacity to continue working and fair procedures have been followed, their services may be terminated in accordance with Section 188(1)(a)(i).

The employer can be taken to the CCMA or Labour Court and be forced to re-employ the employee or give him/her compensation stipulated by the Court.

Where employees can no longer do their work, an employer should first investigate what the extent of the employee's capability to do their job is and what alternatives are available apart from dismissal. These alternatives can include extended sick leave without pay, adapted duties and possible means of accommodating the employee's disability.

An employer may refuse to employ a person who is clearly too ill to work (for whatever reason). But to refuse to employ any person simply because they are known or suspected to have HIV unfairly discriminates against that person on the grounds of HIV status and is therefore unlawful.

An employer could only refuse to employ a person with HIV if being HIV negative was an inherent requirement of the job.

An employee no longer able to work must be provided with an incapacity hearing before they can be dismissed.

A Code of Good Practice on Key Aspects of HIV/AIDS and Employment has been added to both the LRA and the EEA. The Code is a general guide on how employers, employees and trade unions should respond to HIV/ AIDS in the workplace.

The Code provides that should employees no longer have the capacity to perform their functions, employers must examine the extent of the incapacity. Alternatives to dismissal must be examined, which may include short time, extended unpaid sick leave and adapted duties.

Furthermore, employers are required to investigate possible ways to accommodate employees' disabilities. The Code also requires that employees be given the chance to voice their opinions on the possible alternatives or accommodations during the process.

If dismissal still seems the only tenable solution, the Code prescribes those employees must be given an incapacity hearing before they are dismissed.

If an employee who is found incapable has an AIDS related illness, dismissal can be fair provided that the employer follows the steps laid down by the Code of Good Practice on Dismissal.

## **DISMISSAL OF A PERSON WHO HAS AIDS**

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### **Illness and incapacity**

Eventually, many people with HIV start to become ill with AIDS. During this time, an employee may use up a lot of sick leave, and his/her capacity may be affected.

All employees have a right to sick leave and an employer has no right to discriminate against or dismiss an employee who uses these rights. However, an employer is allowed to dismiss an employee on the grounds of incapacity and poor work performance, even if the employee has not used all their sick leave.

The LRA Code of Good Practice sets out very clear procedures for employers and employees when dealing with dismissals for incapacity.

The principle of the Code is that employers and employees "should treat one another with mutual respect".

### **Dismissal without incapacity**

It is unlawful for an employer to dismiss an employee simply because he/she suspects that you may have AIDS, but cannot show any evidence of incapacity.

#### Duties of an employer to make a dismissal for incapacity fair

Investigate the extent of the incapacity or injury.

Decide if it is likely to be permanent (long-term) or temporary (short term).

Investigate alternatives to dismissal.

Consider the possibility of “adapting the duties or work circumstances of the employee to accommodate the employee’s disability”.

#### Promotion of Equality and Prevention of Unfair Discrimination (No.4 of 2000)

The Promotion of Equality and Prevention of Unfair Discrimination Act also sees to it that there is no unfair discrimination in the workplace, especially with things like insurance. This means that an employee with HIV/AIDS must be treated in exactly the same way as all the other employees in the organization in all matters.

#### Occupational Health and Safety Act (No. 85 of 1993) (OHSA)

Sometimes an accident at work can cause a bleeding injury. If the injured person is HIV-positive and someone who tries to help the person also has an open wound, there is a small chance of the helper becoming infected if the wound comes into contact with the injured person’s blood. The employer has a responsibility to make sure that the workplace is safe and that employees are not at risk of HIV infection at work.

OHSA requires that employers create a safe working environment as far as they can.

Regarding HIV/AIDS, the employer has the duties to ensure that steps are taken to minimize the risk of occupational HIV infection:

- ensure that the risk of possible HIV infection is minimised;
- ensure that appropriate first-aid equipment is readily available to deal with spilt blood and body fluids;
- ensure that staff training is undertaken on safety steps to be taken following an accident, and
- ensure that universally accepted infection control procedures are used in any situation where there is possible exposure to blood or blood products.

Furthermore, the occupational transmission of HIV/AIDS should be placed on the agenda of companies’ Health and Safety Committees to ensure that proper control measures are followed.

#### Compensation for Occupational Injuries and Disease Act (No.130 of 1993)

The Compensation for Occupational Injuries and Diseases Act (COIDA) gives every employee the right to compensation for accidents and illness that they get while working.

If an employee gets infected with HIV because of a workplace accident, they can claim for compensation.

An “occupational accident” is an accident arising out of and in the course of a person’s employment, which results in a personal injury, illness or death.

To get compensation, an employee needs to show that HIV infection was the result of the occupational accident.

There are no formal guidelines from the Compensation Commissioner on occupational accidents involving exposure to HIV.

Employees can demand more compensation if they can show that:

- Personal protective equipment was not available, and
- their infection was due to the negligence (carelessness) of the employer, who did not provide a fully safe workplace.

If an accident is not reported to an employer or the Compensation Commissioner within 12 months, an employee loses the right to claim for compensation.

#### The Unemployment Insurance Act (UIF)

The Unemployment Insurance Act offers a range of benefits to South Africans, which include illness benefits are offered to contributors who are incapable of working due to their illness and have been unemployed as a result for longer than two weeks.

Through the introduction of this Act, it is evident that the Department of Labour has taken note of the increased incidence of AIDS related unemployment.

Indirectly, it is also a safety net to business organisations with HIV positive and AIDS affected employees, since if such employees are dismissed from service due to the inability to work, they can be provided with money from the Government. Furthermore, employees who take extended sick leave have the option of resigning and also obtaining funds from the UIF.

#### Medical Schemes Act No 131 of 1998

The Act prohibits discrimination based on "state of health". Therefore, it is an illegal act to discriminate against anyone with HIV or AIDS.

SUMMARY OF THE RIGHTS OF PEOPLE LIVING WITH HIV AND AIDS IN THE WORKPLACE	
RIGHT	LAW
Right to fair labour practices	Constitution and Labour Relations Act (LRA)
Right not to be unfairly dismissed because you have HIV	LRA
Right not to be unfairly discriminated against on the basis of your HIV status	Employment Equity Act (EEA)
Right not to be tested for HIV unless your employer has applied to the Labour Court for authorisation	EEA
Right to a safe working environment	Occupational Health and Safety Act, and Mine Health and Safety Act
Right to compensation if infected with HIV at work	Compensation for Occupational Injuries and Diseases Act (COIDA)
Right to certain basic standards of employment, including 6 weeks of paid sick leave over a 3-year period	Basic Conditions of Employment Act (BCEA)
Right to no unfair discrimination in giving employee benefits	Medical Schemes Act
Right to privacy about your HIV status at work	Common law right

### Dentists as Employers

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Basically, employees with HIV/AIDS must be treated in exactly the same manner as other employees with life threatening illnesses.

TESTING EMPLOYEES IN TERMS OF EEA	
Authorised testing	Permissible testing
Employers must approach the Labour Court in the following circumstances: i. during an application for employment; ii. as a condition of employment; iii. during procedures related to termination of employment; iv. as an eligibility requirement for training or staff development programmes; and	An employer may provide testing to an employee who has requested a test in the following circumstances: i. As part of a health care service provided in the workplace; ii. In the event of an occupational accident carrying a risk of exposure to blood or other body fluids;



- V. as an access requirement to obtain employee benefits.
- iii. For the purposes of applying for compensation following an occupational accident involving a risk of exposure to blood or other body fluids.  
Furthermore, such testing may only take place within the following defined conditions:
  - i. At the initiative of an employee;
  - ii. Within a health care worker and employee-patient relationship;
  - iii. With informed consent and pre- and post-test counselling, as defined by the Department of Health's National Policy on Testing for HIV; and
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- V.

## Labour Relations Act (No.66 of 1995)

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The employer can be taken to the CCMA or Labour Court and be forced to re-employ the employee or give him/her compensation stipulated by the Court.

Where employees can no longer do their work, an employer should first investigate what the extent of the employee's capability to do their job is and what alternatives are available apart from dismissal. These alternatives can include extended sick leave without pay, adapted duties and possible means of accommodating the employee's disability.

An employer may refuse to employ a person who is clearly too ill to work (for whatever reason). But to refuse to employ any person simply because they are known or suspected to have HIV unfairly discriminates against that person on the grounds of HIV status and is therefore unlawful.

An employer could only refuse to employ a person with HIV if being HIV negative was an inherent requirement of the job.

An employee no longer able to work must be provided with an incapacity hearing before they can be dismissed.

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The Code provides that should employees no longer have the capacity to perform their functions, employers must examine the extent of the incapacity. Alternatives to dismissal must be examined, which may include short time, extended unpaid sick leave and adapted duties.

Furthermore, employers are required to investigate possible ways to accommodate employees' disabilities. The Code also requires that employees be given the chance to voice their opinions on the possible alternatives or accommodations during the process.

If dismissal still seems the only tenable solution, the Code prescribes those employees must be given an incapacity hearing before they are dismissed.

If an employee who is found incapable has an AIDS related illness, dismissal can be fair provided that the employer follows the steps laid down by the Code of Good Practice on Dismissal.

## Needle Stick Injuries

The Occupational Health and Safety Act (No. 85 of 1993), which covers all employees, provides that employers must provide and maintain if an accident happens and blood is spilt, there is as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees. This means that all employers must make sure that the workplace is safe, and that employees are not at risk of getting infected with HIV in the workplace.

New regulations require that employers have a duty to see that safety equipment such as rubber gloves are in every first aid box. Furthermore, all staff must be trained in universal precautions and should have access to the equipment needed to use these precautions.

A sharp is defined as any object, or instrument, which may cause a puncture or incisional wound in the skin.

Needlestick injuries can be defined as any piercing wound caused by a needle, or by other sharp instruments or objects such as scalpels, mounted needles, broken glassware, etc. The needlestick injury is one of the most stressful workplace accidents that happen to HCWs.

OHCWs are frequently exposed to blood borne pathogens. These include HIV, HBV, HCV, all of which can be contracted through needle stick and sharps injuries or mucosal splashes.

The average risk of HIV infection after being exposed to HIV infected blood via needle stick injury or cut is:

<b>HIV</b>	<b>0.3%</b>
<b>Hepatitis B</b>	<b>&gt; 30%</b>
<b>Hepatitis C</b>	<b>0-10%</b>

The amount of blood on a used dental hypodermic syringe is extremely small which is further reduced by friction as the needle is withdrawn from the oral mucosa further as it penetrates the rubber glove and superficial layer of the skin.

The amount of blood deposited subcutaneously in the OHCW is insufficient to contain a pathogenic dose of HIV and the local anaesthetic solution may have a deleterious effect on the viability of HIV.

At present infection by the hepatitis B virus poses a greater risk.

The emotional impact of a needlestick injury can be severe and long lasting, even when no infection is transmitted. Not knowing the infection status of the source patient can accentuate the OHCW's stress. It is important that all OHCW are well informed about the exposure risks and educated regarding the appropriate measures to take following an injury.

In the United Kingdom, standard precautions exist to help prevent needlestick injuries where all blood and body fluids, regardless of its source, are considered to contain infectious agents, and treated as such. It is recommended that dentists in South Africa operate on the same basis.

The main risk posed by needlestick injuries is exposure to blood-borne viruses (BBV), particularly Hepatitis B (HBV), Hepatitis C (HCV) and Human Immunodeficiency Virus (HIV). Needlestick injuries can also cause psychological distress, as the injured person may have to cope with the fear that they have been infected.

### Prevention of occupational exposure

Prevention of occupational exposures is the responsibility on both the employer and the employee. The employer is obliged to provide, as far as is reasonably practicable, a safe working environment.

OHCW is required to work safely within that environment, and standard precautions should apply wherever infectious fluid contact is possible.

- Gloves (in appropriate sizes) and protective eyewear must be readily available and promote safety awareness in the work environment.

- Needles should not be recapped and handling of needles after withdrawal from a patient should be kept to an absolute minimum. If possible, eliminate the use of needles where safe and effective alternatives are available.
- All needles and sharp objects should be disposed of in dedicated sharps bins. Syringes and other blunt instruments should not be placed in these bins.
- Sharps bins must be sealed and disposed of once three quarters full. Overfull bins are a risk factor during use and disposal.
- Keep a detailed report of all needlestick and other sharps-related injuries in your workplace and analyse them to identify hazards and injury trends.
- Establish procedures for and encourage the reporting and timely follow-up of all needlestick and other sharps related injuries.
- Report all needlestick and other sharps-related injuries promptly to ensure that they receive appropriate follow up care.
- Inform the employer about the hazards from needles or other sharp instruments that they observe in their work environment.
- Participate in infection control training and recommended infection prevention practices, including hepatitis B vaccination.
- Emphasis should therefore be on PREVENTION OF EXPOSURE through the adoption of safe work practices and following a policy of applying “universal infection control”, when handling ALL blood or blood-stained body fluids.

## Risk Assessment

When an OHCW has sustained an occupational exposure, the situation must be handled sensitively. This may involve asking some highly personal and embarrassing personal questions. The patient must not be approached by the injured OHCW. There is no single approach that will cover every interview, but the following should be observed.

The discussion should take place where proper privacy can be maintained.

The patient should be informed that someone has been injured in an accident involving their blood/body fluid. Injuries of this kind can cause considerable anxiety and worry for OHCWs because of infections such as hepatitis B, hepatitis C and HIV can be transmitted in this way.

Source patient may be asked if they willing to provide a sample of blood to test since positive or negative result will determine the management of the OHCW’s injury, potentially over a period of six months. It is important that undue pressure is not applied and the decision lies entirely with the patient and this must clearly be explained to the patient to comply with this request. Emphasise that the questions are very personal and might very well not apply to them, but they are now asked routinely, for example by blood transfusion services. The outcome of the discussions should be recorded in the patient’s notes. Inform source patient he or she will be notified of the result.

If it is not possible to identify the source patient for a particular needle or sharp instrument or the source patient does not consent to a test, a risk assessment should be carried out to determine the likelihood that the needle may have been used on a patient with blood borne virus (BBV) infection.

The decision to implement post-exposure prophylaxis (PEP) will be determined on a case specific basis, after carefully weighing the potential risks and benefits of providing PEP based on the risk assessment of the exposure incident. PEP should be initiated by the physician appointed by the practitioner.

HIV PEP should be initiated within two to four hours of exposure for maximum efficacy. As the time period from exposure to initiation of PEP increases, the likelihood of the virus establishing infection and spreading beyond the local site.

Baseline and follow-up testing of the exposed OHCW is recommended in situations where risk assessment of the exposure incident has concluded that HIV PEP is indicated, but a decision has been made not to initiate HIV PEP.

If HIV PEP was appropriate but not initiated for the exposed OHCW at the time of exposure and the source patient is subsequently discovered to be HIV positive, HIV PEP should be started as soon as possible, if the exposure occurred less than 72 hours prior. In this case, HIV PEP should be initiated upon receipt of the first positive HIV antibody screening test, before confirmatory test results are available.

If the exposed OHCW has begun an HIV PEP regimen and the source patient is later determined to be HIV negative, HIV PEP should be discontinued regardless of number of days of prophylaxis completed. In these situations, it should be emphasised that continuation of PEP might be considered in rare instances where there is realistic concern that the source patient is in the window period of infection (seroconversion phase). At all times consultation with the physician is recommended.

In addition, the employer must provide for psychological and counselling support for the OHCW. There should be an open-door policy for the affected person to discuss new and ongoing concerns.

### Immediate Care to Exposure site

- Dispose of the sharp/needle Immediately and safely.
- Stop all operative procedures and immediately institute first aid.
- For wounds: wash the exposed site thoroughly with running water.
- Eye or mouth exposure: irrigate with copious quantities of water or saline.
- Skin: Wash with soap and water and rinse
- DO NOT: panic, put the pricked finger in the mouth, squeeze the wound to bleed it, scrub the wound, and do not use bleach, chlorine, alcohol, betadine, iodine or any other antiseptics or detergents to wash the wound.
- The incident should immediately be reported to the practice owner or practice manager.
- Dry the wound and cover it with a waterproof plaster or dressing.
- Clothing contaminated by blood/body fluids should be removed.
- A thorough assessment of the exposure is then required to determine the risk of disease transmission (type of fluid, type of needle, amount of blood on the needle, etc).
- Reassure the employee and the patient that it is only rarely that blood exposures result in infection.

### Reporting incident

- Document the circumstances and record the source of the exposure, the patient's name, and number, date of birth if details are known etc, type of body fluid and type of injury.
- OHCW should be given time to talk about their concerns following the incident and discuss the available information about risks from the exposure. Discuss the practical implications of the test and its result (positive or negative).
- Discuss possible routes of transmission of HIV, Hepatitis C Virus (HCV) and Hepatitis B Virus (HBV).
- Employees should be instructed and educated to immediately report exposure incidents to the dentist employer to permit timely medical follow up.
- The exposure source should be evaluated. A blood sample may not be taken from the patient for the purposes of an HIV test without the patient's consent. The dentist or designated doctor should make arrangements to approach a source patient whose HIV status is not known and ask for their informed consent to HIV testing. This should not be undertaken by the exposed worker.
- If HIV post-exposure prophylaxis is medically indicated it should be initiated promptly within 1-2 hours after exposure incident.
- Immediate reporting also enables the dental employer to evaluate the circumstances surrounding the exposure incident to try to find ways to prevent such a situation arising again.

### Referral to a Health Care Professional

Refer exposed employee to a health care professional immediately and follow-up to perform all medical evaluation and procedures with the employee's consent to be tested for HIV, HBV and HCV.

The designated doctor should first assess if the exposure report was significant i.e. with the potential to transmit HIV. Some OHCW may have occupational exposures which, after careful assessment, are not considered significant i.e. they do not have the potential for HIV transmission.

### Information Provided to the Health Care Professional

The practice owner must provide the HCP with a copy of:

- the blood-borne pathogens standards

- the employee’s job duties as they relate to the incident
- report of the specific exposure incident
- results of the source patient’s blood testing if available subject to specific consent to release the information.

### HIV Status of Source Person

- An attempt should be made as soon as possible to determine the HIV status of the source person. It is recommended that a reliable rapid HIV test be used.
- Where source patient agrees to be test for HIV antibodies, careful pre-test discussion will be needed, as will informed consent.
- As part of pre-test discussion, the source patient should be informed about the incident and the reason for the enquiry and request for a test. The difficulties of the exposed health care worker’s situation should be discussed.
- Testing of the source person should be done in a proper and ethical manner i.e. with informed consent.
- If the source person refuses to have his or her blood taken then it must be assumed he or she is HIV positive.
- The Department of Health guidelines suggest where an existing blood sample is available, an HIV test may be conducted on that sample with the consent of the source person. It may be required to test a patient in an emergency situation in order protect other persons. In such cases, in order to pass the tests of reasonability and justifiability, consideration should be had for the nature of the injury(ies) and the source patient has to be evaluated to determine the likelihood of HIV.
- However, the person must be informed that the blood sample was tested, and if s/he, after pre-test counselling wishes to know the results, the principles of post-test counselling have to be adhered to.

### Counselling

Counselling is a vital component of the required post exposure follow-up procedures [See below].

The employee needs to be counselled regarding his or her infectious status, including results of and interpretation of all tests, and discuss with the employee the possible risks of infection, the need for post-exposure prophylaxis and the protection of personal contacts.

### Exposure Report

The dental employer must prepare a report of the:

- exposure incident;
- date and time of exposure;
- type route of exposure (puncture, laceration, mucous membrane, splash);
- mechanism of exposure, details of the procedure being performed; where, how and type of device used;
- source of exposure: material patient history and stage of disease;
- type of fluid that the employee was exposed to (blood, visibly bloody fluid, other potentially infectious fluid or tissue, concentrated virus);
- whether gloves, eye protection and masks were used at the time of exposure.

Characteristics of Exposure			
Exposure Type	Type of device	Visible blood	Depth of injury
Lower Risk	Solid instrument	No	Superficial or moderate
Higher Risk	Hollow needle	Yes or No	Superficial, moderate or deep
	Visibly contaminated with the patient’s blood Needle placed in vein or artery		
	Any instrument	Yes or No	Deep
		Yes	Superficial, moderate or deep

### Post-Exposure Prophylaxis (PEP)

- PEP is an antiviral therapy designed to reduce the possibility of an individual becoming infected with HIV after a known exposure to the virus. However, currently PEP
- guidelines lack a substantive evidence base to guide advice i.e. efficacy has NOT been demonstrated by randomized controlled trials

- Our current decision-making with regards to PEP is guided by evolving basic science and biological plausibility, supported by animal data and retrospective case control studies utilizing several ARV PEP regimens
- After an occupational exposure, the source patient and the exposed OHCW should be evaluated to determine the need for PEP. Assess the risk to the health care worker (Table 3).
- PEP is recommended for any high-risk exposure including percutaneous [skin perforating needle stick injury, involving:
  - Visible blood on the needle;
  - Needle having been used in a vein or artery of source person.
  - Any deep intra-muscular injury or injection into the body where large volumes of blood or body fluids are involved and prolonged contact with them.
  - Exposure to broken skin and to mucous membranes.
  - PEP should be initiated as soon as possible, preferably within one to two hours after the exposure and within 24 hours.
  - In order to avoid delays in starting PEP, “starter packs” [first three days’ supply of a 28-day treatment] of PEP drugs should be made available while steps are being taken to assess the source patient’s HIV status or where it is known to be HIV positive. If after conclusive testing the source patient is found to be HIV negative, PEP should be discontinued.
  - Consult with a HIV clinician for the most current ARV drug regimen options.

If the OHCW is HIV positive or the source patient is negative	No prophylactic medication for HIV is required
If the source patient is HIV positive and the staff member is negative	It is recommended that prophylactic medication be taken
If the source patient status is unknown and the staff member is negative	No prophylaxis is required. It is however recommended that it be taken.

## Monitoring

Drug toxicity should be monitored at baseline and two weeks after commencement of treatment.

Baseline screening should include a complete blood count, renal and hepatic function tests.

Serum glucose should be tested in individuals receiving a protease inhibitor. If toxicity is noted, modification of the regimen should be considered after expert consultation and further diagnostic tests may be required.

HIV antibody testing should be done at 6 weeks, 12 weeks and 6 months.

## Follow up

OHCW with occupational exposure to HIV should receive follow-up counselling, post-exposure testing and medical evaluation regardless of whether they receive PEP.

This will include the possibility of HIV seroconversion, the importance of starting prophylaxis and behavioural changes that will have to be made for at least six months to prevent transmission of HIV to others.

HIV-exposed OHCW should be advised to: use sexual abstinence or condoms, avoid pregnancy, cease breast feeding, and refrain from donating blood, plasma, organs, tissue or semen.

## Example of Reporting Procedure Form

REPORTING PROCEDURE	SIGNATURE OF RESPONSIBLE PERSON	DATE & TIME
1. Immediate management and completion of exposure report form		
2. Report the incident immediately to person in charge		
3. Institute pre-test counselling		
4. Obtain written, informed consent from the source patient to draw blood for HIV, HBV, HCV		
5. Obtain written, informed consent from the OHCW to draw blood for HIV, HBV, HCV		
6. Contact virologist to arrange for urgent blood tests		
7. Give initial dose of PEP medication		
8. Give prescription for further medication		
9. Report incident to all concerned		
10. Arrange for follow-up blood tests at 6 weeks, 3 months & 6 months		
11. Assess exposure reports for recommendations for future actions (modifying work practices)		

## Guidelines for basic counselling skills

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- It is required by law that everyone who has to undergo an HIV test receives pre-test counselling. Every client who contemplates HIV testing should ideally be fully counselled by a professionally trained counsellor.
- Most health facilities do not have trained counsellors and patients often have to be referred. Due to the fact that oral health care workers are increasing being faced with this situation, it is imperative that they have at least basic counselling skills. It is preferable that all oral health care workers undergo professional training in counselling.

### Why is counselling necessary?

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A person who has tested HIV-positive may never have the same quality of life again. The stigma surrounding the diagnosis of HIV, as well as its associated mortality, poses a challenge for any health care worker who has to break the news to a patient. HIV positive individuals who are given support and help at the time of testing cope better with their situations and are able to talk about their fears and feelings more openly and to plan for the future.

The aims of counselling HIV counselling aims to:

- Provide a supportive environment;
- Help clients manage their problems;
- Explore coping skills that clients may have used before and help them develop new ones;
- Empower clients to become self-sufficient in dealing with emerging issues and problems;
- Counsel clients on how to avoid re-infection and how to prevent infection of others; and
- Explore options with clients that will help them bring about necessary changes in behaviour.

### Pre-test Counselling

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- When giving pre-test counselling, one needs to focus on what the client is feeling and experiencing. In busy practices this may be very difficult, but all reasonable efforts should be made to ensure privacy, a session free of interruptions and where confidentiality is assured.
- Clients should be assured that both counselling and testing are confidential procedures;
- Discuss possibility of referral to a trained professional counsellor in the event of a positive result;
- Provide information about HIV infection and transmission and its links to AIDS, sexually transmitted infections and tuberculosis
- Provide information on the technical aspects of testing i.e., window period, what 'positive' and 'negative' mean
- Discuss the implications of a positive and negative diagnosis;
- Provide information about legal rights. Clients should consider whom to tell (sexual partner/s) and whom not to tell (employer/third party). Clients are not obliged to tell anyone apart from their sexual partners;
- Evaluate risk behaviour and discuss steps that they should take to prevent future infection and transmission;
- Determine whether clients have coping resources and support systems in the event of a positive result;
- Provide clients with a sense of support and hope;
- It is advisable to document the patient's consent.

### Post-test Counselling

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Post-test counselling assists clients to work through the crisis and other issues after learning of their HIV status.

For an HIV-positive result, a few sessions are required:

- Containment (preparation phase);
- Questions and concerns (discussion phase);
- Integration (reviewing the situation).



For an HIV-negative result:

- Discuss the window period;
- Reinforce prevention and safer sexual practice messages;
- Discuss referral if necessary;
- Ongoing counselling may be necessary if the patient indulges in risky behaviour, needs ongoing support, and needs to be counselled for anxiety or depression.

### Ongoing Counselling

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- Ongoing counselling helps the client deal with issues such as partner notification, relationship difficulties, queries about health and treatment and disclosure to others.
- With written permission from the client, the counsellor may liaise with other caregivers.
- The counsellor is often a crucial source of support, since clients often feel that they cannot share the diagnosis with others and they are initially very vulnerable.

## WASTE MANAGEMENT

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The Health Professions Council of South Africa (HPCSA) guidelines on waste management is set out in the booklet 16 section 6. This section states that: "It is the responsibility of all health care practitioners to have a health care waste management system in place or to have access to such a system. Such a system should be provided by an accredited waste service provider and be conducted in accordance with the relevant SABS code". The relevant SABS codes that serve as the basis for the HPCSA booklet 16 can be obtained from the SABS.

Both the HPCSA booklet and regulations require that it is the responsibility of the practitioner to ensure that an accredited health care waste management company is utilised by their practice. Every practice needs to provide evidence of compliance in terms of an acceptable waste management protocol and of effective record keeping thereof.

The disposal of the HCRW generated in oral health care facilities can have adverse effects on the health and well-being of the personnel of the facility, its patients, any visitors and the general public, if not properly managed.

## Introduction

Medical wastes are classified into two general classes: the general or, non-hazardous waste and the hazardous waste. These includes components of waste generated by a generator and can include liquids, but excludes health care risk waste. The general waste, which is comparable to domestic waste, usually constitutes the bulk of medical waste and includes waste generated from administrative works, packaging and maintenance works.

Health care risk waste (HCRW) which is waste capable of producing any disease and includes the following:

a) <b>Chemical waste</b> (means solid, liquid and gaseous products that are to be discarded and that contain dangerous or polluting chemicals that pose a threat to humans, animals or the environment, when improperly disposed of);	b) <b>Cytotoxic waste</b> (means waste that is toxic to cells and that can lead to cell death);
c) <b>Genotoxic waste</b> (means waste capable of interacting with living cells and causing genetic damage);	d) <b>Infectious waste</b> (means material suspected to contain pathogens (bacteria, viruses, parasites or fungi) in sufficient concentrations or quantity to cause disease in susceptible hosts);
e) <b>Isolation waste</b> (means waste containing discarded materials contaminated with excretion, exudates, or secretions from humans or animals who or which are required to be isolated in order to protect others from highly communicable or zoonotic diseases);	f) <b>Laboratory waste</b> (means human or animal specimen cultures from health care and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of bacteria, viruses, or the use of spores, discarded, live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate and mix cultures; and waste containing any microbiological specimens sent to a laboratory for analysis);
g) <b>Pathological waste</b> (means tissues, organs, body parts, blood, body fluids, human foetuses, infected animal carcasses and other waste from surgery and autopsies on patients with infectious diseases);	h) <b>Pharmaceutical waste</b> (means unused medicines, medications and residues of medicines that are no longer usable as medication);
i) <b>Radioactive waste</b> (means liquid, solid or gaseous materials that contain, or are contaminated with, radionuclides at concentrations or activities greater than the clearance levels and for which no use is foreseen);	j) <b>Sharps waste</b> (means items that could cause cuts or puncture wounds, including needles, hypodermic needles, scalpels and other blades, knives, infusion sets, saws, broken glass and pipettes).

In a dental practice 'health care waste' would include both health care general waste and health care risk waste.

Dentists operating a health establishment that generate health care waste has a duty to dispose of the waste safely. They are financial and legally responsible for the safe handling and sound disposal of the waste they produce. Dentists have a responsibility for the waste from the point of generation until its final treatment and disposal.

The quantity of waste being generated from health facilities has been on the increase in recent years due to an increase in the number of healthcare facilities catering for the increasing human population and the use of disposable dental products. With the COVID-19 pandemic, the safe and effective disposal of Personal Protective Equipment (PPE) will increase the quantity of waste produced in the foreseeable future.

In South Africa, incineration is the most common method being used in the disposal of toxic medical waste. They are known to pollute the air by releasing toxic metals to the atmosphere, polluting soil and surface water. The lack of sufficient equipment to deal with the ever-increasing burden of medical waste has resulted in the dumping of a large quantity of the waste in illegal sites and sometimes burning within the premises of the health facilities or disposed with general waste.

## National Policies

The Department of Health supported by the Department of Environmental Affairs is supposed to guide the management of medical waste in South Africa. However, annual reports of the Department of Health in the last decade shows medical waste have not been prioritised. The regulations for medical waste management developed have been delayed several times and they exclude radioactive waste which is also generated in some health facilities in the urban centres.

In South Africa, some of the national policies which can be applied to medical waste management include:

- The Constitution of the Republic of South Africa provides, every citizen of South Africa a right to a safe environment that is not harmful. Improper disposal of medical waste infringes on this right because it may result in the pollution of land, water and air which renders the environment harmful;
- National Environmental Management: Air Quality Act 39 of 2004: This aims to protect the quality of air in the Republic by prevention of air pollution and environmental degradation.
- National Environmental Management: Waste Act 59 of 2008: This is concerned with the licensing process for specified waste activities.
- South African National Standards on Health Care Waste Management : This Standard deals with all aspects of medical waste management from generation to disposal of waste and also includes a guide to the training of staff; According to the Standard, medical waste must be separated at source of generation according to the risks they pose and temporarily stored in colour-coded containers; it also indicates that each health facility must ensure that their workers are trained in the identification and separation of various types of medical waste and contract the final treatment and disposal to an authorized company which should in return hand the facility a certificate of safe disposal.
- Other legislation includes Hazardous Substances Act, Health Act, Environment Conservation Act, Occupational Health and Safety Act, National Water Act, Municipal Structures Act, Municipal Systems Act.

## Provinces

In addition, the provinces also have their own provisions for the medical waste management. Medical waste is being poorly managed in many health facilities in all the provinces of South Africa.

An absence of a national policy to guide all the provinces in applying uniform practice of medical waste management may have contributed much to this, however, in the provinces and health facilities where guidelines have been developed to manage medical wastes, the guidelines are either not being enforced or there is no sufficient equipment to manage the waste as recommended by the guidelines.

## Health care waste management

Key steps identified in the management of medical waste include segregation of waste from its source and storage in appropriate containers; transportation within and out of the health facilities; treatment and final disposal.

### Health care waste segregation and storage

This first step is that health care waste should be segregated and disposed of in separate waste containers from the source, and afterwards stored in a safe place inaccessible to rodents and unauthorized persons and then transported for treatment and disposal.

Once health care risk waste is placed in a health care risk waste container, the waste should not be removed to decant it into another container or sorting it or for any other purpose.

Reusable containers must be effectively disinfected before reuse. Practitioners must provide and require all persons who manually handle containers of untreated health care risk waste to wear clean, protective gloves and overalls, changeable laboratory coats or other appropriate personal protective equipment.

Employees must be trained on an ongoing basis in the correct segregation and minimisation of health care waste and employers must keep records of all training,

All health care risk waste generated shall be identified and classified in accordance with the provisions in the South African National Standards 10234: Globally Harmonized System of classification and labelling of chemicals.



All health care risk waste to be transported shall be packaged and labelled in accordance with the provisions in the South African National Standard 10229.

It shall also be packaged and labelled in accordance with the provisions in the South African National Standard 10248- 1: Management of healthcare waste, Part 1: Management of healthcare risk waste from a healthcare facility; South African National Standard 10248-2: Management of healthcare waste, Part 2: Management of healthcare risk waste for healthcare facilities and healthcare providers in rural and remote settings; South African National Standard 10248-3: Management of healthcare waste, Part 3: Management of healthcare risk waste from minor generators, registered healthcare professionals and non-healthcare professionals.

## Packaging

Solid healthcare general waste shall be placed in a colour-coded waste container in accordance with the table below. A plastic bag used for the containment of healthcare general waste shall not tear easily during handling and transportation.

The packaging for healthcare risk waste shall be clearly marked with the appropriate colour code and the appropriate international hazard label(s). The Table below gives the internationally accepted categories, sub-categories, colour coding, and labelling protocol for healthcare waste.

Waste	Waste sub-category	Colour coding and international hazard label a	In a dental practice
<b>b Human or animal anatomical waste</b>	Infectious human anatomical	<b>RED</b> and the appropriate international infectious hazard label 	Includes any parts from a body, e.g. extracted teeth, other surgical removals and biopsy specimens.
	Infectious animal anatomical	<b>ORANGE</b> and the appropriate international infectious hazard label	None
	Non-infectious animal anatomical	<b>RED</b> and the appropriate international infectious hazard label	None
<b>b Infectious non-anatomical waste</b>	None	<b>BLUE</b> and the international infectious hazard label 	All types of waste that is likely to contain pathogenic microorganisms or agents. In oral health care facilities anything that has been in contact with saliva is considered as infectious, e.g., disposable items such as gloves, masks, cotton rolls, saliva ejectors, suction tips and others.
<b>SHARPS</b>	None	<b>YELLOW</b> , the words DANGER CONTAMINATED Sharps and the appropriate international infectious hazard label	Includes any sharp object likely to contain pathogenic microorganisms or agents that may cause injury as well as infection. Examples of sharps used in oral health care include burs, scalpel blades, suture needles, dental syringe needles, glass and glass cartridges, metal matrix bands, wires, endodontic files and reamers, orthodontic wires and instruments, and wedges.
<b>Chemical waste including</b>	Chemical or pharmaceutical	<b>DARK GREEN</b> and the appropriate international hazard	Includes all kinds of discarded chemicals, including pharmaceuticals

<b>pharmaceutical waste</b>			that pose a special risk to human health and environment, e.g., amalgam, fixer, disinfectants.
	Cytotoxic pharmaceutical	<b>DARK GREEN</b> and the cytotoxic hazard label (see figure 3)	Amalgam products
<b>Radioactive waste</b>	None	No colour coding only the appropriate international radiation hazard label	This includes solid, liquid and gaseous waste contaminated with radio-nuclides. Radio-active waste is normally not generated in oral health care facilities.
<b>General waste</b>		No hazard labels  Black, beige, white or transparent plastic bags can be used.	Health care general waste, includes normal administrative waste, paper, packaging materials, cardboard boxes, plastic bags, etc.
<b>a See international hazard labels.</b> <b>b Chemical or radioactive solutions that contain human or animal anatomical and infectious non-anatomical wastes are considered as chemical waste or radioactive waste, respectively.</b> <b>c Black, beige, white or transparent packaging can be used.</b>			

## Disposal and management of extracted teeth

Extracted teeth are classified as infectious anatomical waste. Specific precautions need to be followed to prevent cross-contamination and exposure risk following extraction of teeth. If the extracted teeth do not contain any filling material it should be disposed of with the hazardous HCRW in the waste container that should be incinerated.

However, if the extracted teeth contain amalgam fillings, a different route of disposal should be followed to avoid incineration. Amalgam waste products pose an extreme environmental health hazard if mercury vapour is released. If extracted teeth are to be used for training purposes, decontamination and sterilisation of the teeth also need to be performed prior to usage to prevent cross-contamination or exposure to an infectious or a hazardous risk.

Steps to follow for extracted teeth:

1. Dispose of extracted teeth as HCRW or return to the patient (upon request).
2. Clean and place extracted teeth in a leak-proof container, labelled with a biohazard symbol, and maintain hydration for transport to training institutions or a dental laboratory.
4. Heat-sterilise teeth that do not contain amalgam before they are used for training purposes.
5. If extracted teeth containing amalgam restorations are to be used for training purposes, it should be immersed in 10% formalin solution for 2 weeks.
6. Disposal of extracted teeth containing amalgam should be in a container that will not be incinerated.

This is to prevent the release of mercury vapour at high temperatures to the environment and thus creating a health hazard. Commercial metal recovery companies also might accept extracted teeth with amalgam for recycling the metal.

## Packaging for infectious waste (excluding sharps)

Packaging for infectious waste shall be made from an impermeable, leak-proof material and shall be compatible with the envisaged treatment of the waste.

Packaging for infectious waste shall be filled to three-quarters capacity of the container and shall be securely closed.

Plastics bags shall be closed by means of non-PVC plastics ties, non-PVC plastics sealing tags of the self-locking type, or heat sealers purpose-made for healthcare risk waste. Plastics bags shall not be closed by means of stapling.

## Health care waste storage

The owner/practitioner must create an intermediate and central storage area for health care risk waste storage.

The intermediate storage area must, at a minimum, include easy access, well ventilated, lit, easy to clear, regular collection, space for empty containers, lockable doors, controlled access and size dependent on rate of waste produced, easy to clean with smooth surfaces, equipped with a spill kit and posted with international biohazardous signage.

The central storage area must, at a minimum, include sufficient space required for accumulation between collections, easy access, secure, clear international biohazardous sign, good ventilation and lighting, smooth impervious floor for easy cleaning, washing facilities, rodent proof, lockable and protected from direct sunlight.

The name of the person in charge of the storage area and contact details displayed on or adjacent to the exterior door.

### Storage Times

The storage times for healthcare risk waste, i.e. the delay between generation and treatment or disposal, shall not exceed the time limits indicated in table 2, unless otherwise specified.

All containers shall be sealed.

**Table 2** — Time limits for the storage of healthcare risk waste

Waste	Time limits
Pathological waste	a 24 h
Infectious waste	a72 h
Sharps containers	90 d
Pharmaceutical waste	90 d
a The waste may be stored at 2 °C for 90 d	

### Collection and Transportation

Practitioners must contract with reputable waste management companies to collect and transport waste from dental facilities. These contracts must only be entered into when the waste management contractor discloses a license or permit authorized by the relevant authority for the treatment or disposal (or both) of each category of healthcare risk waste in accordance with the relevant requirements and regulations of the current relevant national legislation.

These contractors will also supply the necessary containers for the different categories of wastes.

The contractors must provide documentation and those of a sub-contractor, treatment and disposal procedures and facilities that are licensed. The contractor must have a permit and must have all the requirements provided by the waste management team.

The contract must be in writing and must provide the types and volumes of waste to be collected and to be disposed of, the type of treatment methods used, methods of accounting for the HCW collected by the contractor, physical verification of the packages received for treatment and disposal and the potential risk of the hazards and safety measures to be implemented. The contractor must have a back-up plan of providing transport for HCW to off-site treatment and disposal facilities. The waste management company must provide proof of treatment of waste. The practitioner must also monitor the contractor to ensure compliance.

The waste management plan shall include a detailed schedule for the collection of the waste generated at the source.

### Disposal via discharge to a municipal sewer

Most municipal sewage systems are designed and operated to accept liquid infectious waste.

However, the healthcare facility shall not discharge healthcare risk waste to the sewage system.

In the case where there is a need to dispose of healthcare risk waste via a sewage system, the waste management team shall first investigate if the waste can be treated before its disposal in accordance with the input from the sewage treatment operators. The disposal procedures shall be documented.

An emergency spill of liquid waste into the drainage system of the central waste store is not considered disposal via the sewage system. The relevant authorities in the event of such a spill must be informed.

All heavy metals (e.g. mercury, cadmium and chromium) have specific discharge consents or restrictions and shall not be discharged to a sewer.

## COVID-19 and Waste management

In the midst of a global pandemic such as the one caused by COVID-19, the provisions regulating the proper disposal of waste must be remembered.

In particular, the National Health Act No. 61 of 2003 (NHA), the National Environmental Management Act No. 107 of 1998 (NEMA) and the National Environmental Management: Waste Act No. 59 of 2008 (NEMWA).

In addition, the Norms and Standards Regulations Applicable to Different Categories of Health Establishments, published in terms of the NHA, under GN 67 in Government Gazette No. 41419 dated 2 February 2018 (NHA Regulations), provide in regulation 8(1) that:

“[H]ealth establishment[s] must maintain an environment, which minimises the risk of disease outbreaks, the transmission of infection to users, health care personnel and visitors”.

Regulation 9 of the NHA Regulations deals specifically with waste management and provides that health establishments must ensure that waste is handled, stored and disposed of safely in accordance with the law. Additionally, regulation 9 requires that all health establishments must have appropriate waste containers at the point of waste generation and should implement procedures for the collection, handling, storage and disposal of waste.

On 16 March 2020, the Chief Director of Environmental Health and Port Health Services, of the Department of Health, released Environmental Health Guidelines relating to COVID-19 (the Guidelines). The Guidelines seek to provide guidance on the manner in which to control the outbreak of COVID-19 with reference to “Environmental Health Services”.

Guideline 3.7 of the Guidelines deals with waste management monitoring, with a particular focus on health care risk waste, including blood products, cultures, pathological wastes, sharps and human anatomical wastes that contain or may contain infectious substances.

According to guideline 3.7:

the identification, segregation, storage and disposal of HCRW must be managed in accordance with SANS 10248-1: South African National Standard for the Management of Health Care Waste, Part 1: Management of Health Care Risk Waste from a Health Care Facility (SANS 10248-1).

HCRW should be properly packaged in sealed, leak and puncture proof containers or boxes;

HCRW must be labelled with the relevant bio-hazard symbols or signs and marked “Corona virus or COVID-19” and should be stored separately from other wastes generated;

The collection, transportation, treatment and disposal of HCRW may only be performed by an appropriate, qualified service provider.

However, a health establishment must ensure that waste is safely stored until a health care waste management company collects the HCRW and that the company is aware and acknowledges that waste was generated by suspected or confirmed COVID-19 case;

All personnel or staff in contact with patients must be geared with appropriate personal protective equipment at all times to prevent exposure or risk to health; and

All bags, bins and boxes must adequately be sealed, as not to leak any fluids, and must be wiped down with 0.05% chlorine solution before being stored or removed.

Other than the Directions, members of the public have been advised to adhere to the all-other regulations, published in terms of National Disaster Act, from time to time, dealing with the continued functioning of “essential services” – which include services provided by health establishments and essential municipal services that encompass the storage, transfer, treatment and disposal of HCRW. Compliance with the relevant provisions of the NEMA and NEMWA in respect of waste management, therefore, remain a priority and are, in fact, crucial in light of the COVID-19 pandemic.

### Statutory bodies governing occupational health services in South Africa

Governing Body	Legislation	Scope
Constitutional Court	South African Constitution	Makes strong provision for the rights to health and basic health services. Provides for the right to a safe and healthy work environment.
Department of Health and Office of Health Standards Compliance (OHSC)	National Health Act No. 61 of 2003	OHSC is a regulated body under this Act. Requires all healthcare establishments to comply with quality requirements and national core standards for health establishments. OH services have not been included at this time.
Department of Labour	Occupational Health and Safety Act No. 85 of 1993	To provide for the health and safety of persons at work and of persons in connection with the use of plant and machinery; . . . to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.
Department of Mineral Resources	Mines Health and Safety Act No. 29 of 1996	To safeguard the health and safety of mine employees and communities affected by mining operations.
Department of Civil Aviation	Civil Aviation Act No. 74 of 1962, as amended (Part 67)	Regulates the medical examinations required for persons employed in this sector.
Department of Maritime Affairs	Merchant Shipping Act No. 57 of 1951, as amended	Regulates the medical examinations required for persons employed in this sector.
Health Professions Council South Africa	Health Professions Amendment Act No. 29 of 2007	The Act entitles the Council to oversee doctors' training in order to maintain standards, describe the scope of practice, and register professionals who have met the prescribed training requirements.
South African Nursing Council	Nursing Act No. 33 of 2005	The Act entitles the Council to oversee nurses training in order to maintain standards, describe scope of practice and register professionals who meet the prescribed training requirements. Includes training as an occupational health nurse.
National Institute for Occupational Health	Department of Health	Responsible for supporting occupational health at all levels, promoting occupational health services, and fulfilling statutory obligations.
Medical Bureau for Occupational Diseases	Department of Health	Responsible for discharging duties in terms of, and administering, the Occupational Diseases in Mines and Works Act of 1973, as amended.

**Table 4. Role players in the governance of OHS**

State	Service Providers	Client
Department of Health	Private	Employers
Department of Labour	Public	Employees
Department of Mineral Resources	Occupational Health Nurses	
South African Nursing Council	Occupational Medical Practitioners	
Health Professions Council of South Africa		
Department of Aviation		
Department of Maritime Affairs		
National Institute for Occupational Health		
Medical Bureau for Occupational Diseases		



**References:**

Constitution of the Republic of South Africa (Act 108 of 1996)

National Health Act (Act 61 of 2003)

Occupational Health and Safety Act (Act 85 of 1993)

Hazardous Substances Act (Act 5 of 1973)

The National Environmental Management Act (Act 107 of 1998)

Health Professions Act (Act 56 of 1974)

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