Recognising hazards

There are many potential hazards when working in an animal care workplace. There are six major types of hazards:

- physical hazards
- ergonomic
- psychological
- radiation
- biological
- chemical.

The problems that are associated with workplace hazards are:

- injuries and sickness
- acute/chronic health problems
- loss of income to employer and/or employee
- litigation
- workers compensation premium
- rehabilitation/retraining costs
- permanent disabilities.

Physical hazards

Heat and noise are the two main types of physical hazards.

Problems of heat

Heat will vary depending on the:

- ambient air temperature
- source of radiant heat—furnace, sun, autoclave
- presence or lack of air movement
- level of humidity.
Heat can cause the following health problems:

- burns
- cramps
- exhaustion
- sunburn.

Indirect effects of heat can lead to reduced concentration which in turn leads to increased potential for accidents.

The longer term negative effects of heat can also cause congenital defects in the foetus can result in:

- cardio-vascular disease, effects on the heart
- sexual impotence
- skin cancer.

Heat hazards for animals can arise from:

- overzealous blow drying
- heat exhaustion—eg left in sun or in car
- hot water bottles
- heat lamps.

**Remember**: If it’s too hot for you, it’s too hot for the animal—for example, when blow drying a cat.

### Problems of noise

Exposure to excessive noise may cause:

- temporary deafness
- industrial deafness
• poor concentration
• stress.

Ergonomic hazards

Ergonomic hazards result from poor posture and poorly organised tasks. These hazards and task organisation can lead to injuries such as: Repetitive Strain Injuries (RSI), back and neck problems, migraines, varicose veins and wrist strains.

It is important to set up the workplace and any equipment in a way that would prevent ergonomic hazards.

Bad design can lead to chronic/acute injuries, workplace stress, tiredness and irritability. Here are some examples of what to consider:

• equipment design—eg office chairs, computer keyboards
• workplace design—eg bench and shelf heights, steps.

Equipment hazards

Hazards that can arise from equipment include:

• noise
• physical injury—burns, trauma, RSI, biological, poisoning
• fire
• explosion
• slips, trips, falls—eg over power cords
• radiation.

Electricity and water can be a fatal combination. Keep power cords and power points away from wet areas. Mop up all excess water as soon as possible to reduce the opportunity of walking around with wet feet, potentially making you a good electrical conductor.

Prevent hazardous incidents by:

• wearing PPE
• following operating instructions
• training staff
• checking equipment before use
• placing warning signs
• labelling faulty equipment
• reporting faulty equipment to supervisor
• turning off the power after use
• regular maintenance checks
• storing appropriately after use.

In the photo below, notice that two doors are used. One has lead shielding to prevent radiation exposure when taking X-rays and the other door has a clear hazard sign.

Slips, trips and falls

Slips, trips and falls can occur easily from wet floors, slippery surfaces, exposed power cords, leads and obstructions in walkways.

Hazards such as these can be prevented by:

• using hazard signs
• cleaning up any spills promptly
• using non-slip surfaces
• using rubber matting for wet areas
• using clear walkways
• securing any objects that might cause tripping.

If the floor is wet, use a clear ‘Wet floor’ warning sign until the floor is dry, as is shown in the photo below.
Biological hazards and zoonoses

A zoonosis is a disease that can be transmitted from animals to humans.

Staff working in a veterinary clinic or within the animal care industry are in constant contact with all the biological agents capable of causing disease.

Table 1 shows the main types of zoonoses and examples for each.

**Table 1: Examples of zoonoses**

<table>
<thead>
<tr>
<th>Types of zoonoses</th>
<th>Bacteria</th>
<th>Protozoa and other pathogens</th>
<th>Fungi</th>
<th>Viruses</th>
<th>Parasites (internal and external)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examples</strong></td>
<td>Psittacosis</td>
<td>Leptospirosis</td>
<td>Ringworm</td>
<td>Q fever</td>
<td>Hydatid tapeworm</td>
</tr>
<tr>
<td></td>
<td>Salmonella</td>
<td>Toxoplasmosis</td>
<td></td>
<td>Morbillavirus</td>
<td>Flea tapeworm</td>
</tr>
<tr>
<td></td>
<td>Tetanus</td>
<td></td>
<td></td>
<td>Lyssavirus</td>
<td>Roundworm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rabies</td>
<td>Hookworm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sarcoptic mange</td>
</tr>
</tbody>
</table>

How zoonoses can be transmitted

Zoonoses can be transmitted by the spread of infection, skin contact, inhalation, ingestion, injection and injury, such as a cat bite.

Vet nurses are required to handle a range of very ill animals, some of which may be carrying a zoonotic disease. The following are ways disease can be transmitted:

- animal skin, fur and feathers
- excreta (faeces/urine), bodily discharges, vomit
- a body part or sample taken from the animal—eg swab, blood, tissue sample
- equipment or bedding that has been in contact with animals—eg needle, blanket, collar
- during medical procedures—eg water vapour plus bacteria released during ultrasonic teeth scaling
- accidental injection from a vaccine.

Working in a dairy, as can be seen in the photo below, is potentially dangerous as you are in a position where faeces and urine can be inhaled. An example of a zoonotic disease that is transmitted this way is leptospirosis. Vaccines are available against some of these and staff should make sure they are vaccinated.

Factors promoting infection in people include:
- weak immune system
- concurrent disease
- medication
- stress
- poor hygiene.

Prevention of zoonotic diseases

Zoonotic diseases can be prevented by:
- maintaining hygiene—eg disinfection, isolation, personal hygiene
- using protective equipment—eg face mask when doing teeth, gloves, aprons
- correctly disposing of contaminated needles, dressings, etc
- taking vaccinations—eg against tetanus, hepatitis, Q fever, lyssa virus and leptospirosis
- educating staff of the dangers of zoonoses.
Hygiene protocol

The type of hygiene measures that you use will depend on the:

- health status of the animal—eg infectious disease
- age of animals
- environmental factors—eg temperature
- type of housing
- purpose of animals—eg research animals.

The age and health status of the animals being handled will affect the chances of transmitting zoonotic diseases.

The more intensely stock are housed, as can be seen in the photo below, and the greater the number of stock being handled by staff, the greater the opportunity to contract a zoonotic disease.

Clothing when handling animals

The type of protective clothing you will need will depend very much on the types of tasks you do with the animals. Compare what you might need to wear if you were working as a stable hand or if you were assisting a veterinary surgeon.
Loose-fitting clothes are not suitable for handling animals as a flapping shirt or jacket could send a flighty horse into a spin or smaller animals may catch their claws or limbs in the folds of the material.

Jewellery is not recommended as it can get caught up in hair, buckles, leads and cause injury to hands, fingers and ears.

The animal attendant in the photo below shows an example of good dress sense for working with animals. Note the solid shoes, well-fitting trousers, neat hair and the minimal amount of jewellery.

![Image of animal attendant](image-url)

**Types of Personal Protection Equipment (PPE)**

It is important to be protected when handling possible contaminants such as chemicals or diseased animals. Wearing a mask, gloves, plastic apron and solid shoes will reduce the risk of injury or disease. In the photo below, for example, a mask, pair of plastic disposable gloves and plastic apron are all being worn.
• Boots: When riding horses or handling large animals, remember to wear solid boots with good soles, smooth elastic-sided for riding and comfortable-fitting for walking. Steel-capped work boots are recommended when working around cattle, sheep or horses. This will prevent injury to your feet if stood on by hard-footed animals.

• Helmet: Always wear an approved safety helmet to protect your head when riding. It is impossible to make an insurance claim if you are not wearing one when you have an accident.

• If working outdoors with sheep or cattle, wear a sun hat.

• Gloves: It is recommended that you wear riding gloves or leather gloves to protect your hands from rope burns, blisters, scratches or burrs if working with large animals such as sheep, cattle and horses. Gloves can also protect your hands from bacteria or contamination from chemicals if you are vaccinating or treating large animals for parasites.

Wearing the correct protective clothing, as the male animal attendant in the photo below is, will reduce the risk of injury and contamination to employees and housed animals.
Using antiseptics

These are chemicals that cause the destruction or inhibition of microorganisms, preventing their growth. They can be used on skin and other tissue.

Some of the main factors which should be taken into account when choosing a product are:

- the purpose of the product
- the period that it takes for the chemical to kill the target organism
- known local conditions—eg hard water
- safety of staff and animals—the product should be non-irritant, non-toxic and non-corrosive
- stability of product in storage
- odours and smell—must be odourless or have a pleasant smell
- ease of use
- economy of use—cost per made up litre of ready-to-use solution.

Note: Some products are effective for kennels but may stain bedding. Some animal species are sensitive to some types of disinfectant—eg phenol is toxic to cats.

Chlorine products irritate the nasal passages and eyes of both animals and humans.
<table>
<thead>
<tr>
<th>Chemical group</th>
<th>Example</th>
<th>Spectrum of activity</th>
<th>Problems</th>
<th>Main use</th>
<th>Residual activity</th>
</tr>
</thead>
</table>
| Iodine compounds       | Povidone-iodine 5% or 10%      | Bacteria, viruses, fungi, protozoa, yeasts                                             | • Detergent in the scrub is cytotoxic  
• Corrosive to metals  
• Inactivated by organic matter  
• Contact dermatitis and skin irritation which can increase post-surgical wound infections | Surgical prep  
Wound irrigation               | 4-6 hrs            |
|                        | 7.5% scrub                    |                                                                                      |                                                                                                                                           |                                 |                   |
| Aqueous iodine         | As above                      |                                                                                      | • Cytotoxic and can increase infection due to cell damage  
• Stains                                                                 | Wound lavage                   |                                 |
| Tincture of iodine     | As above                      | Only for intact skin as it is too irritant                                            |                                                                                                                                           |                                 | 2% iodine in 50% ethanol |
| Bisbiguanide           | Chlorhexidine as a scrub solution |                                                                                      |                                                                                                                                           | Use for presurgical prep of skin, wound therapy  
Disinfection of instruments  
Unaffected by alcohol | 2 days—binds to a protein in the skin surface  
Onset of action on the skin is rapid |
| Phenols                | Hexachloraphene Dettol         | Bacteria                                                                             | • Neurotoxicity from dermal exposure  
• Cytotoxic                                                                 | Slow onset of action when applied to the skin  
Inactivated by alcohol           | Up to 2 days                   |
| Alcohols               | Isopropyl alcohol 50% or 70%  | Bacteria and some fungi                                                              | • Neurotoxic  
• Cytotoxic                                                                 | Used alone or as a tincture  
Inactivated by organic matter     | None as it evaporates            |
|                        | ethanol                        |                                                                                      |                                                                                                                                           |                                 |                   |
| Aldehyde               | Glutaraldehyde                | Bacteria, viruses, yeasts, spores (but only with prolonged contact—3 hours)          | • Skin irritation  
• Inhalation  
• Irritant hypersensitivity                                                                 | 2% solution used for ‘cold sterilisation’ of objects  
Must be thoroughly rinsed off due to toxicity | None                            |
|                        | Formaldehyde                   |                                                                                      |                                                                                                                                           |                                 |                   |
| Quaternary ammonium compounds | Benzalkonium chloride Savlon | Bacteria                                                                             | • Dermatitis  
• Hypersensitivity  
• Toxic if ingested                                                                 | Used for disinfection           | None                            |
| Hydrogen peroxide      | Minimal bactericidal          | Minimal bactericidal                                                                 | Cytotoxic                                                                                                                                  | Should only be used once at the first irrigation of a | None                            |
Disinfection

Disinfection is a technique used to remove or destroy most pathogenic organisms, except heat-resistant bacterial spores. Methods include the use of chemicals and some physical processes, such as boiling.

Environmental disinfectants are designed for use on inanimate objects only. Many require that the user wear protective clothing and they should never be used on the skin.

Dairy farms need to be washed out and disinfected twice daily. This creates a situation where the staff are exposed to constant contact with chemicals. This can cause health problems if not done with care.

<table>
<thead>
<tr>
<th>Chlorine compounds</th>
<th>action</th>
<th>contaminated wound</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hypochlorite (bleach)</td>
<td>Bacteria, viruses, fungi</td>
<td>Cytotoxic</td>
</tr>
<tr>
<td>2. Chloramines (halamid)</td>
<td></td>
<td>Can damage some surfaces by bleaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chloramines are less irritant to the skin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Often used against ringworm</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Psychological hazards

Stress factors in the workplace arise from excessive workloads, threat of danger or dealing with the public. Stress can also be the result of discrimination based on sex, race, religion, age or other sources, such as harassment and emotional factors—eg dealing with the grief caused by the death of an animal. Dealing with customers, especially difficult ones can be stressful—as can be seen in the photo below of a situation in a vet clinic.
Stress increases the likelihood of accidents and mistakes. It is important to learn to recognise any signs of stress and work out strategies for dealing with any stress. The signs of stress can include:

- feeling unable to slow down and relax
- explosive anger in response to minor irritations
- anxiety or tension lasting more than a few days
- feeling that things frequently go wrong
- tension and migraine headaches
- weight loss or weight gain
- gastro-intestinal disorders
- inability to focus attention
- fatigue
- increased dependence on drugs.

Dealing with stress

Here are a few tips for dealing with stress:

- Learn to recognise the symptoms of stress.
- Discuss your workload with your supervisor.
- Don’t bottle up your feelings.
- Seek professional help; consult your General Practitioner or see a counsellor.
- Look after yourself—diet, sleep, time-out, relaxation and exercise.
- Mix with a fun crowd.

Remember: laughter is as good as a dose of medicine!
Radiation hazards

Microwaves and visual display units are used commonly in many workplaces. They are sources of radiation hazards. The three main sources of radiation in vet clinics are:

- ionising radiation (X-rays)
- ultrasonic radiation
- radioactive isotopes used in cancer treatment.

Of these, ionising radiation and the radioactive isotopes are the most hazardous. These rays cannot be seen, felt or heard by the operators. They are absorbed by whatever matter is in their path, e.g., an animal, lead, etc. The denser the material, the more X-rays they absorb. Lead, being very dense, absorbs most of the rays emitted and therefore is used as a protective shield.

Table 3 shows ways of avoiding overexposure to X-rays.

**Table 3: Avoiding excessive exposure to X-rays**

<table>
<thead>
<tr>
<th>Justification</th>
<th>Each X-ray taken has to have a benefit to the animal that will outweigh the cost of irradiation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimisation</td>
<td>The operators must use the lowest exposure possible to obtain the X-ray</td>
</tr>
<tr>
<td>Compliance in limits</td>
<td>The operators must not exceed the maximum allowed exposure for the year.</td>
</tr>
<tr>
<td>Time of exposure</td>
<td>Shortest possible.</td>
</tr>
<tr>
<td></td>
<td>All animals should be under general anaesthesia so no one has to hold the animal under the direct beam of the X-ray.</td>
</tr>
<tr>
<td></td>
<td>No one is allowed in the room while the X-rays are being taken.</td>
</tr>
<tr>
<td>Distance</td>
<td>Focus the beam so it is only aimed at the part of the animal needing to be X-rayed.</td>
</tr>
<tr>
<td>Shielding</td>
<td>Concrete walls and lead aprons, gloves and thyroid protectors.</td>
</tr>
<tr>
<td></td>
<td>Never allow any part of the body to be exposed to the primary beam, even if protected by the lead clothing.</td>
</tr>
</tbody>
</table>
Equipment

| Should be in good repair and older models replaced by newer machines. The protectors should be handled carefully to prevent cracks developing in the lead. They should be checked every 12 months for cracking. |

Technique

| Good technique will decrease the number of X-rays that need to be taken. If an animal has to be manually restrained, always look away from the unit during exposure to protect the lens of the eye. Use as few people as possible for the restraining or use alternative methods like sticky tape, ropes, sandbags. |

Education

| Staff must be aware of the hazards. |

Routine monitoring

| No one to go over the maximum limit. This is monitored by a badge worn by all personnel working with the X-ray unit and each worker has their own. |

Pregnant workers and minors (under 16)

| Should be NOWHERE near the X-rays when in use. |

Avoiding physical hazards in an emergency

An emergency scene can be dangerous and your personal safety is always your first concern. You should carefully survey the scene prior to giving aid to reduce the risk of injury to yourself, bystanders, the public and the animal.

Whenever you are unsure whether the scene is safe or not, contact your vet, police or council and withdraw from the scene and wait for the properly trained personnel with the appropriate equipment to deal with the situation. Table 4 gives examples of situations you may need to deal with, as well as suggestions for what to do to avoid further hazards.

Table 4: Responding to accidents

<table>
<thead>
<tr>
<th>Type of accident</th>
<th>Appropriate action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storms</td>
<td>Be aware of flying debris, lightening strikes and falling trees—do not leave shelter until the storm has passed.</td>
</tr>
<tr>
<td>Multiple victims</td>
<td>Prioritise treatment according to severity of injury. Start with the most life threatening first.</td>
</tr>
<tr>
<td>Traffic accidents</td>
<td>Check for oncoming traffic and turn on hazard lights of the vehicle involved if possible to warn other drivers. Remove the animal from the road as quickly as possible if injuries permit.</td>
</tr>
<tr>
<td>Hazardous materials</td>
<td>Stay a safe distance away, uphill and upwind. Notify the emergency personnel immediately and warn other</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td>If at home, shut off the main switch to prevent electrocution,</td>
</tr>
<tr>
<td></td>
<td>fallen power lines are dangerous and no attempt should be made</td>
</tr>
<tr>
<td></td>
<td>to render assistance until the electricity has been switched off.</td>
</tr>
<tr>
<td><strong>Fire</strong></td>
<td>Never enter a burning structure or high risk area during a bush</td>
</tr>
<tr>
<td></td>
<td>fire to rescue an animal. Wait for experienced personnel to</td>
</tr>
<tr>
<td></td>
<td>attend and inform them of the situation.</td>
</tr>
<tr>
<td><strong>Animal attack</strong></td>
<td>Do not put yourself at risk of being attacked to protect the</td>
</tr>
<tr>
<td></td>
<td>victim; seek assistance from experienced personnel or bystanders</td>
</tr>
<tr>
<td></td>
<td>to scare the attacker away before approaching the victim.</td>
</tr>
</tbody>
</table>

### Chemical hazards

Chemicals in any workplace may be toxic, corrosive, cause irritation and be explosive/flammable. Sensitisation can arise from specific chemicals and usually occurs after long-term exposure to that chemical. Effects seen include dermatitis, respiratory problems, nausea and vomiting.

Chemicals can be contacted by:

- absorption through the skin and mucous membranes
- ingestion
- inhalation
- injection.

### Working with chemicals safely

To create a safe environment, it is necessary to:

- Eliminate the risk of exposure to chemicals to prevent adverse health and safety effects to all personnel.
- Always read the label—there is safety information on that label and you should read it BEFORE using the substance.
- Obtain and read any relevant Material Safety Data Sheets (MSDS) before using a chemical—these can be obtained from manufacturers and list safety precautions as well as what to do in an emergency.
- Follow safety procedures according to manufacturers’ directions.
- Record and keep an inventory of all chemicals, as required by legislation.
- Store chemicals in compliance with legislative requirements.
• Assess the health risks to staff exposed to chemicals in the course of their work by means stated in the industry codes of practice.
• Dispose of chemical waste in compliance with legislative requirements.
• Wear the appropriate Personal Protection Equipment (PPE), such as overalls, gloves, face-shields, masks, ventilators and footwear.

If you are using radiographic chemicals, make sure you also:
• Observe Short-Term Exposure Limit (STEL). Read MSDS.
• Keep containers closed and read labels carefully.
• Do not store chemicals near extreme heat or open flame.
• Make sure substances do not come in contact with strong oxidising agents and other chemicals.
• Do not expose to extreme heat or open flame.
• Handle in a well ventilated area.
• When using the chemicals, do not eat or drink.

If you are using sprays for preventing parasites, such as sprays used for sheep, use masks so as to not inhale the chemicals. Serious reactions can occur which require immediate medical treatment. Correct use of protective clothing and masks is a legal requirement of using insecticides.

Packaging chemicals

In most cases, substances would be expected to be supplied in their original packaging. Where an animal care worker, such as a veterinary surgeon, wishes to supply a smaller quantity and has to repack it into another container, this container must:

• be sufficiently strong to prevent leakage arising from the ordinary risks of handling, storage or transport
• be securely closed and be capable of being re-closed (other than a preparation packed for use on one occasion only).

Containers such as paper envelopes cannot fulfil the regulation requirements and must not be used.

A poison or restricted substance intended for external animal use should be supplied in a container which has the outer surface embossed with the words, ‘POISON’ and with the words ‘NOT TO BE TAKEN’. The bottles should have prominent vertical ribs or other such device so that it can be distinct from other containers ordinarily used for foods and internal medicines. Always remember that using food and drink containers is illegal.
Products in dark or opaque containers

Any product that comes in a dark or opaque bottle is usually one that is affected by light and these must be decanted into another dark or opaque, correctly labelled bottle.

The photo below shows that the first two bottles are opaque. All bottles should then be labelled correctly and clearly.

Products such as Maldison actually become more toxic on exposure to light and the use of clear glass bottles for these is illegal.

Storage and handling of dangerous goods

To further assist with the identification of dangerous goods and their particular hazards, those of class 3, 4, 5, 6 and 8 are assigned to a packing group which represents the ‘level of danger’ to persons exposed.

Dangerous goods registers are lists of product names of all stated dangerous goods and combustible liquids stored and handled in the workplace that the registers cover, with accompanying MSDS.

Such registers are not normally required in the veterinary clinic workplace because of the small quantities of such goods stored. However, it is a legal requirement that MSDS are required for all hazardous and dangerous goods substances in the workplace.

Transporting hazardous substances

When transporting hazardous chemicals that are in the original unopened containers:

- keep them separate from people and foodstuffs
- protect the load from weather
- secure the load to limit its movement
- don’t leave vehicle unattended or unlocked
• display appropriate signage according to legal requirements.

Waste anaesthetic gases and vapours

Animal care workers working in veterinary clinics need to be aware of the potential of inhaling anaesthetic gases and vapours. Short-term problems of inhaling anaesthetic gas include headache, fatigue, irritability and nausea. Long-term effects may include:

• reproductive disorders—eg spontaneous abortions
• cancer
• mutation effects on unborn children
• liver and kidney disease.

Anaesthetic gases and vapours can escape from:

• leaking anaesthetic machines
• patient escaping during administration—eg mask induction
• leaking cuff on endotracheal tube
• patient during recovery and is no longer connected to the anaesthetic machine but is exhaling the gas from its lungs
• spilling the liquid during filling of the vaporiser
• the unavailability of a scavenger system on anaesthetic machine to remove the waste vapours and gas exhaled by the animal.

To control and prevent such hazards, ensure the scavenging system is removing the waste air and gas, there is ventilation in the operating room, the equipment is regularly maintained and staff are informed of any potential hazards and how to avoid them.