

<b>Policy Hierarchy link</b>	<a href="#">Work Health and Safety Policy</a> <a href="#">HS323 Biosafety Procedure</a>		
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<b>Superseded Documents</b>	HS066 Animal Research HS Risk Identification Guideline, Version 3.5 approved 30 April 2014		
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<b>Associated Documents</b>	See section 5		
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## 1. Introduction and Scope

There are various health and safety risks associated with and arising from the use of animals for research and teaching purposes. The aim of this guideline is to assist workers in the identification and control of these risks.

This guideline is applicable to all UNSW research and teaching activities that involve the use of animals, including animal husbandry and housing. It is applicable to all supervisors, staff, students and visitors who participate in or manage such activities.

## 2. Definitions

For the purposes of this guideline there are no definitions.

### 3. Guidelines

The information contained in this guideline should be used as a resource when documenting a risk assessment prior to commencing work with animals. This section contains information on:

- the health and safety (HS) hazards and risks associated with animals and some possible risk controls;
- particular risks to health and safety during pregnancy; and
- HS clearance or approval requirements prior to commencing animal work.

All work with animals must have current UNSW Animal Ethics approval.

Evidence must be maintained to show that workers have been trained to perform their work and have demonstrated competency in those tasks.

All work in UNSW Animal facilities and UNSW Physical Containment facilities must follow the Australian Standard AS/NZS 2243 series for minimum best practice as well as any legislated requirements.

#### 3.1 Health and safety hazards, risks of injury or illness associated with animals and some possible risk controls

##### 3.1.1 Tetanus

The risk of exposure to tetanus for workers in an animal facility, working with all types of animals, must be considered in any risk assessment.

Certain types of wounds are likely to favour the growth of tetanus organisms. These wounds may be the result of an animal bite or scratch, but could also be pre-existing, non-work related, wounds, and could include:

- compound fractures;
- bites, scratches or deep penetrating wounds, (See Appendix 2);
- wounds containing foreign bodies (especially wood splinters);
- wounds complicated by pyogenic (pus producing) infections;
- wounds with extensive tissue damage (eg. contusions or burns); or
- any superficial wound obviously contaminated with soil, dust or manure (especially horse manure) if topical disinfection is delayed more than 4 hours.

In previously vaccinated people, the administration of more than 1 dose of a tetanus-containing vaccine in a 5-year period may provoke adverse events. Adults who have sustained injuries deemed to be tetanus prone should receive a tetanus booster dose if more than 5 years have elapsed since the last dose.

**Table 1: Hazard type/Risk of injury or illness and possible controls** (Note: the information in this table is not exhaustive)

Hazard Type/ Risk of Injury or Illness	Possible Risk Controls
<p><b>3.1.2 Allergens</b></p> <ul style="list-style-type: none"> <li>• Particularly animal proteins, urine and serum</li> <li>• Hair/fur/dander</li> <li>• Mould spores</li> <li>• Dust (eg feed, wood products/bedding)</li> <li>• Latex particles/gloves (talc)</li> <li>• Mites in animal feed</li> </ul> <p style="text-align: center;"><b>Laboratory Animal Allergy (LAA)</b></p> <ul style="list-style-type: none"> <li>• Prevalence: - 7 to 44% of people exposed to laboratory animals, especially rats</li> <li>• Smoking and history of allergies may increase prevalence of atopic/allergic disease</li> <li>• Allergic rhinitis (hay-fever) accounts for 90% of all symptoms associated with LAA</li> <li>• Allergic reaction of lower respiratory tract (eg asthma symptoms, coughing, shortness of breath)</li> <li>• Allergic dermatitis or contact urticaria (eg itchy rash, hives)</li> </ul> <p><b>3.1.3 Hazardous manual tasks</b></p> <ul style="list-style-type: none"> <li>• Lifting, carrying, pushing, pulling and related activities</li> <li>• Handling of animals, goods (eg feed and bedding) and equipment such as compressed gas cylinders</li> <li>• Risk factors:- posture, design of work station and activity, size/weight of object, animate or inanimate, height, position, duration, frequency, etc</li> <li>• Risk of muscular stress – especially back, shoulders, arms, neck</li> <li>• Risk of Occupational Overuse Syndrome from repetitive activities such as scraping or washing cages, or sustained postures (eg restraining animals)</li> <li>• Crush injuries could be caused by large animal (eg when corralling animals, or injecting or crutching activities), or arise from over-stacking of feed and bedding</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing ventilation can reduce allergen exposure four-fold</li> <li>• Air filtering</li> <li>• Screen food supplies for mites</li> <li>• High quality/low dust bedding and feed documented</li> <li>• Physical barriers to reduce exposure</li> <li>• Safe Work Procedures (SWPs)</li> <li>• Training/awareness</li> <li>• Pre-employment medical</li> <li>• Smoking reduction program</li> <li>• Annual monitoring for early detection of Laboratory Animal Allergy (LAA) - lung function tests, and possible blood antibody testing</li> <li>• Personal Protective Clothing and Equipment (PPE) - gloves/gowns/ P2 mask for routine work higher risk activities</li> <li>• Glove allergies – reduce use of latex or use non-latex gloves, use non-powdered gloves, use cotton liner</li> <li>• Good housekeeping</li> </ul> <ul style="list-style-type: none"> <li>• Modify object, size, weight if possible (eg order in smaller animals or smaller bags of feed/bedding)</li> <li>• Mechanically restrain large animals</li> <li>• Modify actions, movements</li> <li>• Specific training in animal handling and hazardous manual tasks procedures</li> <li>• Team lifting and mechanical aids</li> <li>• Documented SWPs</li> <li>• Care with stacking of heavy bags of feed and bedding</li> <li>• Good housekeeping</li> </ul>
<p><b>3.1.4 Biohazards</b></p> <ul style="list-style-type: none"> <li>• Hazard/risk depends on the nature of employment and workplace setting. For example, the specific animal type, whether the colony is Specific Pathogen Free (SPF), whether animals are screened for pathogens, tasks/activities, route of transmission or exposure, susceptibility of worker</li> </ul> <p style="text-align: center;"><b>Zoonotic diseases</b></p> <p>Zoonosis – an infectious disease of animals that can be transmitted to humans (and humans to animals)</p> <p><i>See Appendix 1 for examples of zoonoses related to common animal species.</i></p>	<ul style="list-style-type: none"> <li>• Quarantine / segregate potentially infectious animals</li> <li>• Screen colony for pathogens</li> <li>• Reduce potentially high risk exposure such as needle-stick injury, splash to face/mucous membranes, etc</li> <li>• Vaccination of workers if appropriate (see 5.1 for The Australian Immunisation Handbook)</li> <li>• Use properly maintained biosafety cabinets</li> <li>• Correct animal handling and restraint to avoid being bitten</li> <li>• Specific training: - including biosafety, animal handling, use of sharps</li> <li>• Documented SWPs including waste disposal, spill response and emergency procedures</li> <li>• Good hygiene practice especially with unscreened human material or animals of unknown infectious status</li> </ul>

Note:

1. Q fever – especially ruminants (goats, sheep) some native animals, rabbits, and especially in pregnant animals
2. Protozoal diseases – especially rodents, cats, sheep and non-human primates. Particular risk if pregnant or immunocompromised
3. Some zoonoses may have several transfers eg Hendra Virus – bats to horses to humans

#### Non-zoonotic diseases

- Tuberculosis
- Hep B – especially from unscreened human material used in animal research
- Other infections resulting from handling animals and sharps

### 3.1.5 Hazardous Chemicals

#### Volatile anaesthetic agents eg

Isoflurane and Halothane:

- Associated with psychomotor, hepatic and renal dysfunction
- Possibly associated with increased susceptibility to infection or neoplasm and
- Possibly associated with miscarriage or foetal abnormalities

#### Ether:

- highly flammable and explosive in air
- *Must not be used*

#### Euthanasiates eg Lethabarb:

- Lethal

#### Formaldehyde/formalin:

- irritant of respiratory tract and eyes,
- allergen/ sensitiser,
- *carcinogen*

#### Carbon dioxide:

- used for euthanasia
- heavier than air, asphyxiant
- Compressed gas

#### Oxygen:

- Oxidising gas, fire hazard
- Compressed gas

#### Scheduled drugs:

- must only be used according to instructions or on veterinary advice

#### Cleaning chemicals and disinfectants:

- may be corrosive or irritant in concentrated form

#### Other lab chemicals:

- cytotoxic chemicals, hazardous substances or hazardous chemicals.

### 3.1.6 Radiation

- Ionising radiation from radioisotopes and x-ray equipment
- Radioisotopes commonly alpha, beta or gamma emitters
- Risk of internal exposure if radioisotope inhaled, ingested, injected or other direct exposure
- Risk of external exposure from radioisotopes, irradiating apparatus, non-ionising radiation sources
- Non-ionising radiation including laser, UV, electromagnetic

- Take care when cleaning up waste to avoid skin and oral contact
- Identify and use appropriate PPE
- Good housekeeping

- Consider double-gloving or using cut-resistant gloves

- Anaesthetic gas scavenger system
- Minimise dust, fumes and aerosols using mechanical ventilation, fume hood
- Regular servicing of equipment
- Appropriate chemical storage facilities and segregation of chemical types
- Specific training – biosafety and hazardous substances
- Restraint of gas cylinders
- Use of appropriate fittings for all gas lines
- Good housekeeping
- Access to Safety Data Sheets (SDSs)
- Proper labelling of all chemicals, mixtures and waste
- Prohibit smoking and eating in facility
- Documented SWPs including waste disposal, spill response and emergency procedures
- Good hygiene practice
- PPE including specific respiratory protection where identified

- Approved area for use of radiation
- Perspex shielding for beta radiation
- Lead shielding for gamma and x-ray
- Specific radiation safety training
- Radiation licence is required for staff
- Radiation monitoring, personal dosimeter
- Similar to chemical controls – eg SWPs, waste, spill and emergency procedures, PPE

<p><b>3.1.7 Other Hazards</b></p> <ul style="list-style-type: none"> <li>• Strong magnetic field from MRI equipment</li> <li>• Bites and scratches from laboratory animals (See Appendix 2)</li> <li>• Cuts or puncture wounds – eg scalpels, surgical instruments and needles, broken glass</li> <li>• Gas cylinders and regulators – potential leak or explosion, hazardous manual tasks</li> <li>• Electrical shock – eg faulty equipment or working in wet environment</li> <li>• Thermal – eg hot (autoclave), cold (liquid nitrogen or freezer)</li> <li>• Noise – eg animals, equipment, activities</li> <li>• Slips, trips and falls – eg wet floors, animal cage/barriers, unhoused hoses, poor housekeeping</li> <li>• Bites, scratches, kicks and butts</li> <li>• Exposure to weather - eg sunlight</li> <li>• Offensive smells – especially ammonia in urine</li> <li>• Stress and grief – arising from emotional attachment to animals, animal euthanasia, ethical considerations</li> </ul>	<ul style="list-style-type: none"> <li>• Persons with metal implants/heart pacemakers not to enter rooms containing MRI magnets</li> <li>• Facility and equipment maintenance program</li> <li>• Adequate air exchange</li> <li>• Electrical testing and tagging program, equipment inspection &amp; maintenance programs</li> <li>• Restricted access</li> <li>• Training in animal handling, use of equipment</li> <li>• Stress controls – consult with supervisor and colleagues, attend training, implement personal coping strategies, seek counselling</li> <li>• Restrain animals to reduce risk of bites, scratches, kicks etc</li> <li>• Knowledge of appropriate first aid treatment and how to seek medical advice. (See Appendix 2)</li> <li>• Good housekeeping</li> <li>• Safety signs</li> <li>• PPE - including hearing protection if appropriate, hat/sunscreen/long sleeves for outdoor activities</li> <li>• Hazard and incident reporting, investigation and corrective action response</li> </ul>
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## 3.2 Health and safety risks during pregnancy

The most significant hazards to mother and unborn child are:

### 3.2.1 Physical trauma

Physical changes associated with late pregnancy make the pregnant woman more susceptible to injury from hazardous manual tasks.

### 3.2.2 Zoonoses and Infections

- The key zoonotic disease during pregnancy is toxoplasmosis (eg from cats) however protozoal diseases may also be a risk for pregnant or immunocompromised people.
- Listeriosis (from certain types of food) is a significant risk during pregnancy.
- Intrauterine infection may lead to congenital abnormality or death of the foetus. Fastidious personal hygiene is required to minimise risk of infection.
- Medical advice should be sought before receiving any vaccination.

### 3.2.3 Chemical contamination

Risks associated with use of formaldehyde and anaesthetic gases, which are frequently used in the animal facility. Implementation of appropriate controls will ensure that there is no greater risk to a pregnant worker than to others in the workplace.

### 3.2.4 Ionising radiation

The human embryo and foetus is more sensitive to radiation than adults, especially the pre-implantation embryo (ie before pregnancy is known or confirmed). There is the potential for mutation and genetic/developmental defects.

## 3.3 Additional health and safety issues

Animal technical staff must be made aware of any additional hazards and risks arising from research protocols. For example:

- Handling animals that are radioactive, cytotoxic or that have been infected for research purposes; or
- Handling animals that are sick, post-operative or in pain.

Workers should be well trained in animal handling techniques, infection and contamination control, the administration of drugs and anaesthetics, as well as surgical procedures before commencing such activities, in order to reduce the risk of injury to themselves, others, and the animals. Staff and students must be aware of the psychological effects of stress and grief that can arise when working with animals and when having to euthenase animals.

Security for animal facilities is important to minimise risk of unauthorised access eg by Animal Activists. Animal facilities must remain locked when unattended.

Implement precautions to minimise the risk of animal escape from the containment facility or during transport.

## 4. Other health and safety requirements

### 4.1 HS clearances

Approval is required from some or all of the following:

- **Animal Care and Ethics Committee (ACEC)** approval is mandatory
- **Head of School or Research Centre** for the project
- **Supervisor** must approve the risk assessment that has documented all identified hazards, rated the risks and listed the effective controls (see Risk Assessment and Control form)
- **UNSW Institutional Biosafety Committee (IBC)**, where the research involves:
  - genetically modified organisms (GMOs), including the use of gene-knockout mice or transgenic animals, the infection of animals with GMOs (See Gene Technology Procedure)
  - risk group 3 or 4 organisms (see Biosafety Procedure)
- **UNSW Radiation Safety Committee**, for the use of radiation (see Radiation Safety Procedure) such as:
  - Radioactive substances incorporated into the treatment or into the animal's feed
  - Research processes utilizing Class 3 or 4 lasers
- **UNSW HS Unit** for assistance with obtaining approvals for:
  - The certification of animal facilities for dealings with GMOs
  - using risk group 3 or 4 organisms,
  - using Security Sensitive Biological Agents and registering the facility (see Biosafety page)
  - obtaining licences to use radiation and registering the laboratory for the use of radiation
  - using known carcinogens (see Carcinogens Guideline)
  - the purchase and use of Schedule 8 drugs (see Schedule 8 Drugs Procedure)
  - Australian Quarantine

### 4.2 HS incident reporting requirements

1. Any illness or injury sustained in association with UNSW research activities must be reported using the UNSW online reporting system.
2. Any injury, or any suspected or actual laboratory acquired illness (related to carrying out work with a research-related biological agent) must be reported to the Biosafety Coordinator and also to the Facility Manager or Head of the research group.
3. WorkCover reportable incidents: With respect to biological research, the Head of School/ Research group or the facility manager must notify their

Faculty Coordinator or the HS Unit Manager immediately on being notified about a WorkCover reportable incident, which include:

- Death;
- Requiring immediate hospital admission as an in-patient;
- Requiring medical treatment within 48 hours of an exposure to a substance;
- An infection attributed to work with a microorganism, human blood or body substances, animals, animal parts or animal waste products; or
- Contracting any of the following zoonotic disease while working with animals, animal parts or animal waste products:
  - Q-fever;
  - Anthrax;
  - Leptospirosis;
  - Brucellosis;
  - Hendra Virus;
  - Avian flu virus; or
  - Psittacosis.

Refer also to the WHS Act 2011 Part 3, Section 35, and WHS Regulations 2011 Part 11.3, Clause 699 for the full description of Incident Notification requirements

## 5. References, History and Appendices

[Australian and New Zealand Council for the Care of Animals in Research & Teaching \(ANZCCART\)](#): website and fact sheets  
University of Queensland: Guideline for animal containment facilities (2010)

### 5.1 References

#### Legislation

[Work Health and Safety Act 2011](#) and [Work Health and Safety Regulation 2011](#)  
[Animals Research Act 1985](#) and [Animal Research Regulation 2010](#)  
[Poisons & Therapeutic Goods Regulation 2008](#)  
[Radiation Control Regulation 2013](#)

Commonwealth [Gene Technology Act 2000](#) and [Regulations 2001](#)

[Department of Health and Aging](#) – (National Security legislation) SSBA

WorkCover Pregnancy and Work guide

Department of Agriculture: [Australian Quarantine](#)

[Australian Standards](#): AS/NZS 2243 Safety in Laboratories series, especially Parts 1 and 3.

Centre for Disease Control: Study – [Laboratory animal allergy study](#) (Sweden, 2002)

[The Australian Immunisation Handbook](#), 10<sup>th</sup> edition, 2013.

#### UNSW

[Animal Care and Ethics Committee](#)

[Work Health and Safety Policy](#)

[Gene Technology Research Procedure](#)

[Biosafety pages](#) for AQIS, Biosafety, Gene technology and SSBA

[HS323 Biosafety Procedure](#)

[Radiation Safety pages](#)

[Carcinogens information](#)

[HS331 Schedule 4 and 8 Drugs Procedure](#)

[HS329 Risk Management Procedure](#)

[Environmental Risk Rating Procedure](#)

[HS017 Risk Management Form](#)

[HS435 Immunisation Guideline: Tetanus, Hepatitis A, Hepatitis B and Q Fever](#)

### 5.2 Document history

This Guideline will be reviewed in accordance with the UNSW HS Management System Review Procedure, to address changes in legislation, changes to WorkCover

requirements or any changes within the University that impact on HS regulatory requirements.

Version	Date	Author	Approval	Sections modified	Details of amendments
1.0	10/04/06	Phyllis Heggie	Manager OHS & Environment		New document
2.0	01/01/07	Phyllis Heggie	Director Human Resources	All	Revise all content and reformat document

Version	Authorised by	Approval Date	Effective Date	Sections modified
3.0	Director, Human Resources	14 April 2011	14 April 2011	Entire document reviewed, transferred to UNSW Guideline template (KN)
3.4	Director, Human Resources	14 April 2013	14 April 2013	Updated Branding Logo in accordance with UNSW Branding Guidelines. Modified the document identifier from OHS to HS in accordance with WHS legislation review
3.5	Director, UNSW Safety and Sustainability	30 April 2014	30 April 2014	Reviewed for administrative updates
3.6	Director, UNSW Safety and Sustainability	5 August 2015	5 August 2015	Revise re: National Audit Tool and update links to new HS website

### 5.3 Appendix 1: Examples of zoonoses associated with common species

#### Rodents and rabbits

Salmonella  
 Lymphocytic choriomeningitis virus (note: never demonstrated in Australia, but believed to be here)  
 Ringworm  
 Q fever  
 Parainfluenza virus (sendai virus)  
 Pseudotuberculosis  
 Leptospirosis (Weil's disease)  
 Giardia  
 Encephalomyocarditis virus  
 Cryptosporidia  
 Sodokosis  
 Hantavirus (Korean Haemorrhagic fever)  
 Bites e.g. rat bite fevers, mixed aerobic/anaerobic infections

#### Cats

Toxoplasmosis (from cat faeces)  
 Cat scratch fever  
 Ringworm  
 Toxocara cati, Toxascaris leonina (from cat faeces)  
 Chlamydia psittaci  
 Bites due to oral anaerobic bacteria, pasteurilla & others  
 Sporothrix schenckii  
 Mites  
 Assorted cryptosporidia  
 Pasteurella

#### Birds (including poultry)

Chlamydia psittaci (especially parrots)  
 Salmonella  
 Mites  
 Bird flu



**Sheep**

Q fever  
Salmonella  
Anthrax  
Orf  
Dermatophilus  
Brucellosis

**Cattle**

Leptospirosis  
Q fever  
Ringworm  
Pseudocowpox (orf, milker's nodule, papular stomatitis)  
Ascarid allergy  
Cryptosporidia  
Brucellosis  
CJD

**Dogs**

Hydatidosis  
Ringworm  
Leptospirosis (Weil's disease)  
Toxocara canis  
Ascarid allergy  
Rabies (if travelling overseas)  
Mites, assorted

**Pigs**

Erysipeloid  
Ringworm  
Salmonella  
Ascarid allergy  
Sarcoptes  
Encephalomyocarditis virus (potential)  
Streptococcus suis  
Cryptosporidia  
Balantidium coli  
Yersinia  
Swine flu

**Bats**

Hendra virus  
Lyssa virus  
In some countries may be a reservoir for Ebola

**Primates (Including human)**

Herpes virus simiae (B virus)  
Hepatitis A, B, C, D, E  
HIV  
Yaba virus  
Cytomegalovirus  
Poliomyelitis virus  
Tuberculosis (*M. tuberculosis*)  
Shigella  
Salmonella  
Giardia  
Balantidium coli  
Entamoeba histolytica  
Sarcoptes

## 5.4 Appendix 2: Treatment of bites and scratches from laboratory animals

Irrespective of where the animal was sourced, any bite or scratch from an animal needs immediate attention. Rat bites in particular need closer attention.

Refer to paragraph 4.2 for the requirements for reporting such incidents.

### 5.4.1 Superficial injury

If the bite or scratch does not break the skin, or the wound is very shallow:

- wash the area with soap and running water
- apply an antiseptic cream (optional and only if cream is within expiry date)
- Monitor the injury. Seek medical treatment if:
  - the area becomes obviously infected,
  - the area becomes red and/or swollen and/or painful

*Note:* if you intend to continue working, the wound must be covered with a waterproof dressing. Gloves must be worn while working.

### 5.4.2 Deeper injury

Where a shallow bite or scratch has breaks the skin but there is little bleeding:

- wash the area with soap and running water
- apply an antiseptic cream (optional and only if cream is within expiry date)
- Seek medical advice within 8 hours.
- if intending to continue working, apply a dressing (as above)
- if intending to immediately seek medical advice, do not cover.
- Seek medical attention as soon as possible if:
  - the area becomes obviously infected,
  - the redness, swelling and/or pain increases significantly
  - you suspect/know a bone is broken
  - tissue has been torn from the wound-site

### 5.4.3 When to seek medical treatment

Wash the area, and seek medical treatment as soon as possible for any of the following:

- Any puncture wound to the hand, particularly on a finger or near a joint
- Any wound to the face
- Any wound where the bleeding does not stop after applying 15 minutes of pressure
- If a bone may be broken or if something might be left in the wound eg part of a tooth or claw
- if the wound site contains soil or animal wastes, or is obviously infected,
- the redness, swelling and/or pain increases significantly
- tissue has been torn from the wound-site
- If the victim is pregnant or immunocompromised (ie has a medical condition or receiving medication that could affect immunity eg diabetic, receiving cancer treatment)

Antibiotics may be required and immunisation may need to be considered

### 5.4.4 Wounds at increased risk of becoming infected include:

- Crush injuries such as bites from a dog or other large animal
- Puncture wounds such as bites from cats, rodents (especially rats), birds
- Bites and deep scratches to the hands, particularly fingers
- Kicks from animals, especially where the skin is broken
- Injuries resulting in broken bones where the skin is broken, particularly if the injury is near a joint
- if the wound site may contain soil, animal wastes.