THE UNIVERSITY OF WESTERN AUSTRALIA
ANIMAL ETHICS COMMITTEE

GUIDELINES FOR EUTHANASIA OF ANIMALS
IN RESEARCH AND TEACHING

Purpose
Performing euthanasia correctly is an ethical imperative. The purpose of this document is to provide guidelines to be used when planning euthanasia of animals used for scientific purposes as part of research protocols at The University of Western Australia. They are designed to assist researchers, animal care technicians and the Animal Ethics Committee (AEC) to ensure that the scientific aims of a proposal are achieved with the least possible discomfort for the animals involved.

Policy
All scientific procedures carried out on animals must comply with the eighth revision of the Australian code for the care and use of animals for scientific purposes, 8th edition 2013 (The Code) and the Animal Welfare Act 2002 (WA).

UWA Animal Ethics Committee (AEC) ensures that all animal activities relating to the care and use of animals are conducted in compliance with the code.

Guidelines
General:
Euthanasia is defined as a gentle death and is a method of humane killing. The Australian code for the care and use of animals for scientific purposes, 8th edition 2013 (The Code) defines humane killing as the act of inducing death using methods appropriate to the species that results in a rapid loss of consciousness without recovery and minimum pain and/or distress to the animal.

According to the Code euthanasia or humane killing may occur:

- at set experimental time points (Code: 3.1.26).
- as a welfare intervention - to ensure that adverse impacts on animal wellbeing are addressed rapidly (Code 2.1.5 v (d)).
- in the event of any other unexpected adverse event or emergency (Code: 2.1.5 v (d)).

Code Principles for Euthanasia and Humane Killing:

The Code (3.3.45) states that:

The method and procedures used for killing an animal must be humane and:

1. avoid pain or distress and produce rapid loss of consciousness until death occurs.
2. be compatible with the purpose and aims of the project or activity.
3. be appropriate to the species, age, developmental stage and health of the animal.
4. require minimum restraint of the animal.
(v) be reliable, reproducible and irreversible.
(vi) ensure that animals are killed in a quiet, clean environment away from other animals.
(vii) ensure that death is established before disposal of the carcass, fetuses, embryos and fertilised eggs.

Dependent offspring of animals to be killed must be cared for or humanely killed (Code: 3.3.46).

**Setting endpoints**

Experimental, intervention and humane endpoints must be set and documented as part of the AEC application prior to the commencement of the project (Code: 3.2.16). Intervention points and endpoints (Code: 3.1.27) must be applied as early as feasible and they must ensure that:

(i) the duration and extent of pain and distress are minimised.
(ii) valid data are obtained at the earliest time point before or following the onset of pain and distress.

**Wildlife studies**

For wildlife studies involving the use of traps, a management plan must be established and implemented for captured target and non-target species to ensure their wellbeing or that they are humanely killed, if necessary (Code: 3.3.35).

**Feral and pest species**

Captive feral and pest species must be killed humanely unless the aims of a project require their release (Code: 3.3.44).

**Competency to Perform Euthanasia**

Euthanasia procedures must be performed competently, by people competent for the procedures or under the direct supervision of a person competent to perform the procedures (Code 2.4.8 (xix)).

**Other general considerations:**

The most appropriate method will also depend on the:

- Availability and cost of agents and/or equipment, as well as hazards involved in their use (e.g. required permits and storage for scheduled drugs, carcass disposal).
- Operator experience, skill and comfort.
- Circumstance and location (e.g. planned versus emergency euthanasia and ease of handling of the animal).

The welfare of the animal must be the priority at all times and may necessitate immediate intervention. This should occur without delay and should take priority over any scientific or educational outcome/objectives of a project. The Animal Welfare Officer (AWO) must be promptly notified of any unanticipated adverse events.

(See Animals and research: policies, procedures and guidelines and Reporting Incidents).

**AEC Recommendations on choice of method - Preferred 'Two-Step Method’**

The AEC considers the use of anaesthesia or deep sedation prior to euthanasia as current best practice for animals, as this reduces anxiety and distress to both the animal and operator. Therefore, this method should be used unless there is a valid reason why this cannot be performed and this has been fully explained within the AEC application.
The AEC recommends use of ‘best practice methods’ for euthanasia as illustrated below.

For further details of anaesthesia or sedative agents and physical/chemical euthanasia methods please see:


*The AEC recommends the use of the least impactful route of administration of injectable anesthesia agents.

The AEC considers administration of barbiturates (e.g. pentobarbitone) by intraperitoneal injection in conscious animals to be painful (due to the high pH of the solution) and recommend that it is only administered as the euthanasia agent in animals that have already been anaesthetised or deeply sedated with another agent.

Two examples of ‘Two-Step Method’ of euthanasia in rodents:

- Deep sedation with medetomidine (sc), followed by overdose of barbiturate (iv or ip).
- Anaesthesia by inhalation of isoflurane, followed by cervical dislocation.

The code states that ‘Euthanasia procedures must be performed competently, by people competent for the procedures or under the direct supervision of a person competent to perform the procedures’ (Code 2.4.8 (xix)).

The personnel performing euthanasia must be specifically identified in the AEC application.

Use of alternative methods of euthanasia for mammals and non-mammalian species:

If a researcher or teacher wishes to propose the use of an alternative method of euthanasia (i.e. without anesthesia or deep sedation as the first step), specific information must be provided in the AEC application as illustrated.

For any alternative method you must provide: a step-by-step description of the technique with full explanation and justification; details of responsible personnel and a description of their specific skills and experience in this method.
**Confirmation of Death, Tissue Sharing and Carcass Disposal:**

Death **must** be confirmed by examining the animal for cessation of vital signs before tissue use or carcass disposal occurs (*Code: 3.3.45*(viii)).

Details of how death will be confirmed must be appropriate for the species and stage of development, and must be included in the AEC Application. It is essential that personnel are adequately trained to recognise and confirm that death has occurred.

Use of a combination of criteria is the most reliable way to confirm death.

In most mammal and bird species, the absence of heart beat **together with** cessation of respiration (assessed by the use of a stethoscope, if possible) **and** lack of corneal reflex are used to verify death.

Additional care must be taken to ensure death following euthanasia in ectothermic vertebrates such as fish, reptiles and amphibians. Such animals may normally exhibit very low heart rates, and the heart and brain are very tolerant to hypoxia, therefore a secondary method of euthanasia is recommended for ectothermic vertebrates. For example, in amphibian species (e.g. frogs and toads) double pithing (causing destruction of both the brain and spinal column) is recommended as a secondary euthanasia method to ensure death has occurred.

Fetal and neonatal animals are resistant to hypoxia and metabolise drugs more slowly, and for these reasons additional care must be taken to ensure death has occurred.

**Tissue Sharing**

Where practicable, tissues and other biological material from animals being killed should be shared among investigators or deposited in a tissue bank for subsequent distribution (*Code: 1.26*).

See also **Use of Animal Tissues or Cadavers**.

**Carcass Disposal**

All carcasses must be double wrapped and frozen until disposal by standard university practices. **Animal Care Services** usually co-ordinates the disposal process. Radioactive carcasses should be stored and disposed of in accordance with **Radiation Protection Office Guidelines**.

**Further Information**

Further advice can be obtained from the **Research Integrity Office** or the **Animal Welfare Officer**.