

Training

Euthanasia of Injured Wildlife

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Thousands of animals are euthanased every year in this country. After every option has been exhausted to find foster homes for domestic as well as native animals, there are still thousands that must be humanely destroyed. This unpleasant but necessary task requires a certain level of skill and knowledge if it is to be done humanely and painlessly.

These notes are designed to give some theory and to provide the understanding necessary for humane animal euthanasia.

Introduction

The term euthanasia is derived from the Greek word *eu* meaning good and *thanatos* meaning death. A “good death” would be one that occurs with minimal pain and distress.

It is our responsibility as veterinarians and human beings to ensure that if an animal's life is to be taken, it is done with the highest degree of respect, and with an emphasis on making the death as painless and stress free as possible. Euthanasia should result in rapid loss of consciousness followed by cardiac and respiratory arrest and ultimate loss of brain function. In addition, the technique should minimise the distress and anxiety experienced by the animal prior to the loss of consciousness.

The criteria for painless death can only be established after mechanisms of pain are understood.

Pain is the sensation (perception) that results from nerve impulses reaching the cerebral cortex via ascending neural pathways. I will not go into depth in understanding pain but there are a few things to keep in mind. All drugs that relieve or suppress pain work best if given before pain is initiated. Once pain is caused it is much more difficult to control. Discomfort, fear, anxiety and depression will all increase the stimulus of pain. Remember that pain will have a reflex action on the cardiac and respiratory function as well as the pituitary and adrenal systems.

For pain to be experienced, the cerebral cortex and subcortical structures must be functional. If the cerebral cortex is non-functional because of hypoxia, depression by drugs, electric shock, or concussion, pain is not experienced. Therefore the choice of euthanasia agent or method is less critical if it is to be used on an animal that is anaesthetised or unconscious, provided that the animal does not regain consciousness prior to death.

Stress can be defined as the effect of physical, physiologic, or emotional factors (stressors) that induce an alteration in the animal's homeostasis or adaptive state.

An animal's response to stress depends on its experience, age, species, breed, and current physiologic and psychologic state.

As with many other procedures involving animals, some methods of euthanasia require physically handling the animal. The amount of control and kind of restraint will be determined by the animal species, breed, size, state of domestication, degree of taming, presence of painful injury or disease, degree of excitement and method of euthanasia.

Proper handling is vital to minimise pain and distress in the animal and to ensure safety of the person performing the euthanasia and often to protect other people and other animals.

It is imperative that personnel performing euthanasia on animals be trained. Training and experience should include familiarity with the normal behaviour of the species being euthanased, an appreciation of how handling and restraint affects that behaviour and an understanding of the mechanisms by which the selected technique induces loss of consciousness and death.

General Considerations

In evaluating the method of euthanasia, consider the following

1. Ability to induce loss of consciousness and death without causing pain, distress, anxiety or apprehension.
2. Time required to induce loss of consciousness.
3. Reliability.
4. Safety of personnel.
5. Irreversibility.
6. Compatibility with required purpose.
7. Emotional effect on observers and operators.
8. Compatibility with subsequent evaluation, examination of tissue etc.
9. Drug availability and human abuse potential.
10. Compatibility with species, age, and health status.
11. Safety for predators/scavengers should the carcass be consumed.
12. Is economical and readily available

Animal Behaviour Considerations

Gentle restraint (preferably in a familiar and safe environment), careful handling, and talking during euthanasia often have a calming effect on animals that are used to being handled. Preparation of observers should also be taken into consideration.

Native animals that are in the wild pose an additional challenge. When handling these animals, calming may be accomplished by minimising visual, auditory and tactile stimulation. Struggling during capture or restraint is often the norm as these animals are not used to humans.

Behaviour and physiologic response to noxious stimuli include distress vocalisation, struggling, attempts to escape, defensive or redirected aggression, salivation, urination, defecation, evacuation of anal sacs, pupillary dilation, tachycardia, sweating, and reflex skeletal muscle contractions causing shivering, tremors or other muscular spasms. Fear can cause immobility or “playing dead” in certain species, particularly rabbits and birds. This immobility process should not be interpreted as a loss of consciousness when the animal is, in fact, conscious. Distress vocalisations, fearful behaviour, and release of certain pheromones by a frightened animal may cause anxiety and apprehension in other animals. Therefore, **for sensitive species, it is desirable that other animals not be present when individual animal euthanasia is performed.**

Human Behaviour Considerations

Human psychological responses to euthanasia of animals need to be considered. Grief at the loss of life is the most common reaction. There are six situations where people are affected by euthanasia of animals

1. Veterinary Clinic setting. Animals are euthanased under the best possible conditions with full understanding of procedures and counselling is often available to the carer.
2. Refuge situation where unwanted, homeless, diseased and injured animals must be euthanased in large numbers. Stress often develops among the volunteer helpers and there is often a need to frequently change the personnel.
3. Laboratory setting. Researchers, technicians and students often become attached to animals that have to be euthanased.
4. Wildlife situation. wildlife biologists, veterinarians, managers and carers are often responsible for euthanasia of animals that are injured, diseased, in excessive number or that threaten property or human safety. Although relocation of some animals is appropriate and attempted, relocation is only a temporary solution to a larger problem. People who must deal with these animals, especially under public pressure to save the animal rather than destroy them, can experience extreme distress and anxiety.
5. Livestock and poultry slaughter situation. A large number of animals processed daily can take a heavy toll on employees physically and emotionally. Federal and state agricultural employees may also be involved in mass euthanasia of poultry and livestock in the face of a disease outbreak or natural disaster e.g drought and floods.
6. Public exposure. Because euthanasia of zoo animals, animals involved in roadside or racetrack accidents, stranded marine animals, nuisance or injured wildlife and others can all draw public attention, human attitudes and responses should be considered whenever animals are euthanased.

Modes of action of euthanasing agents.

1. **Hypoxia**, direct or indirect. Agents that induce death by direct and indirect hypoxia can act at various sites and can cause loss of consciousness at various rates. For death to be painless and distress-free loss of consciousness should precede loss of muscle movement. Thus agents that produce paralysis without loss of consciousness (muscle relaxants, strychnine, nicotine and magnesium salts) are not acceptable
2. **Depression** of nerve cells in the brain causing loss of consciousness followed by death. Some of these agents release inhibition of motor activity during the first stage of anaesthesia, resulting in a so-called excitement or delirium phase, during which there may be vocalisation and some muscle contractions. These responses do not appear to be purposeful. Death follows loss of consciousness, and is attributable to cardiac arrest and/or hypoxaemia following depression of the respiratory centres.
3. **Physical disruption of the brain activity**, caused by concussion, direct destruction of the brain, or electrical depolarisation of neurones, induces rapid loss of consciousness. Death occurs because of the destruction of the midbrain centres controlling cardiac and respiratory function. Exaggerated muscle activity can follow loss of consciousness and, although it may disturb some observers, the animal is not experiencing pain or distress.

Euthanasia Agents

Inhalant Agents: Requires special equipment, can be very effective. Most of these agents are hazardous to personnel because of the risk of explosion (ether) narcosis (halothane), hypoxia (nitrogen and carbon monoxide) and addiction (nitrous oxide)

1. Chloroform may be effective for very small birds, mammals and some small reptiles. It needs a small airtight container and an adequate amount of chloroform. Death can take up to 10 minutes
2. Carbon Monoxide (car exhaust) modern cars with catalytic converters are not as lethal producers of carbon monoxide, does cause sleep initially so is considered humane.
3. Carbon Dioxide as a euthanasing agent for small birds and mammals under 600 grams is being developed by WIRES in NSW using a small chamber and soda bulbs as a source. This looks like being their best solution for euthanasing small animals and birds.

Non-Inhalant Drugs: The use of injectable euthanasia drugs is the most rapid and reliable method of performing euthanasia. It is the most desirable method when it can be performed without causing fear or distress in the animal.

When the restraint necessary for giving an animal an intravenous injection would impart added distress to the animal or impose undue risk to the operator, sedation, anaesthesia, or an alternative route of administration should be employed.

When intravenous administration is considered impractical or impossible, intraperitoneal administration of a non-irritating agent is acceptable.

Lethabarb is quite alkaline and is often diluted with water or saline 50:50 so as not to cause any irritation when injected intraperitoneal.

Intramuscular, subcutaneous, intrarenal, intrasplenic intrathecal and other nonvascular injections are generally less acceptable.

Intrathoracic and intrapulmonary are sometimes employed but are generally frowned upon as they may cause the animal to cough.

When intraperitoneal injections are used animals may be slow to pass through stages 1 and 2 (sedation and excitement) of anaesthesia. Accordingly they should be placed in small cages in a quiet area to minimise excitement and trauma. The common agent used in Australia is a product called Lethabarb or Valabarb. These products contain approximately 5 times the strength of the Barbiturate that is found in a normal anaesthetic injection.

Barbiturates depress the nervous system in descending order beginning with the cerebral cortex, with loss of consciousness progressing to anaesthesia. With an overdose, deep anaesthesia progresses to apnoea, owing to depression of the respiratory centre, which is followed by cardiac arrest.

Advantages: With intravenous injection animals become unconscious in about 8 seconds and respiratory and cardiac arrest follow by about 15-20 seconds from commencement of injection. It is very smooth and there is minimal discomfort

Disadvantages: Intravenous injection required for best results. Animals must be restrained. State laws restrict the use of these products to licensed Vets etc. These drugs may persist in the carcass and may cause sedation or death of animals that eat the carcass.

The advantages far outweigh the disadvantages. Intraperitoneal injections may be used in situations where an intravenous injection would be distressful or even dangerous.

Physical methods of Euthanasia

These methods include captive bolt, gunshot, cervical dislocation, decapitation, electrocution, microwave radiation, kill traps, thoracic compression, exsanguination, stunning and pithing. Many would consider most physical methods of euthanasia such as shooting, clubbing and flicking to be aesthetically displeasing and unacceptable. When done appropriately with the right equipment and in the right situation some are considered acceptable. It cannot be done by the fainthearted.

Physical methods are harder for most carers as it requires a certain amount of resolve to do it and it is a very personal way to take a life

Unacceptable methods of euthanasia include drowning, freezing, CO₂ for any animal over 600g, decapitation or cervical dislocation for any mammal over 150 gram. Chloroform or ether for microbats and reptiles as they can slow their breathing/metabolism, Exsanguination.

Wildlife

For wildlife and feral animals, many recommended means of euthanasia for captive animals are not feasible. There are situations involving free ranging wildlife where euthanasia is not possible from the animal or human safety standpoint and killing may be necessary. Conditions found in the field, although more challenging than those that are controlled, do not in any way reduce or minimise the ethical obligations of the responsible individual to reduce pain and distress to the greatest extent possible during the taking of an animals life. Because lay personnel in remote settings often perform euthanasia of wildlife, guidelines are necessary to assist veterinarians, wildlife carers in developing humane protocols for euthanasia of wildlife.

Behavioural responses of wildlife to capture and close human contact are very different to those of domestic animals. These animals are usually frightened and distressed. Thus minimising the amount, degree, and/or cognition of human contact during procedures that require handling is of the utmost importance. **Minimisation of auditory, visual and tactile stimulation will help ensure the most stress free euthanasia possible.**

It would be nice if we could always give an anaesthetic first then put the animal to sleep. In cases where anaesthetics are not available intraperitoneal injections of Lethobarb, although slower in producing loss of consciousness, should be considered preferable over intravenous injections, if restraint will cause increased stress to the animal or danger to the operator.

Amphibians Fish and Reptiles

Euthanasia of ectothermic animals must take into account differences in their metabolism, respiration and tolerance to cerebral hypoxia. In addition it is often more difficult to determine when the animal is dead.

Lethobarb can be administered intravenously, intraabdominally or intrapleuroperitoneally in most ectothermic animals depending on anatomic features. Subcutaneous lymph spaces have also been used in frogs and toads Time to effect may be variable with death occurring in up to 30 minutes.

With reptiles most experienced handlers prefer crushing the head as the most effective and humane.

When to Euthanase?

May I refer you to the excellent paper given by Dr Jon Hanger and Dr Andrew Tribe “Management of Critically Ill Wildlife the reality and practice of wildlife euthanasia” National Wildlife Rehabilitation Conference paper 2004

Only experienced wildlife carers that understand the species concerned should make the decision regarding euthanasia.

There are many reasons that will warrant euthanasia. These may include but are not limited to:-

- Where an animal is suffering due to disease, disability, injury or age related factors (may include abandonment of young at or near birth, degenerative conditions or general reduction in fitness associated with increased age), and the condition cannot be corrected or alleviated to an extent that ensures a reasonable “quality of life”.
- Where an animal has suffered due to disease, disability, injury or age related factors and the condition has been corrected or alleviated but not to the extent that allows appropriate release back to habitat.

Consider “Species Management Programmes “ for endangered species.

Wildlife carers must always be realistic when considering the options of treatment or euthanasia. This is very important with regards to decisions regarding many birds. A wing fracture in a guinea fowl that spends most of its time on the ground may well cope with a wing that is not fully functional whereas a swallow that relies on catching insects on the wing needs a wing that is 100% functional to survive. Fractures very close to joints or disruption of joints will nearly always necessitate euthanasia in a bird.

You must always confirm that the animal is dead. For most mammals cardiac and respiratory arrest must be observed for at least 1 minute. This will often be much longer in reptiles as they can hold their breath for long periods and heartbeat can be difficult to detect.

Legal Requirements

Different states in Australia have different legislation

Queensland. In this state we seem to have had a win in the last 12 months in that the legislation has been changed. It has taken 2 years for the group I represent to be recognised as a Prescribed Entity under the Animal Care and Protection Act 2001, which is administered by the DPI&F

It is the Drugs and Poisons Service of the Environmental Health Unit that issues the permit to possess and use restricted drugs Approval under Section 18(1) of the Health (Drugs and Poisons) Regulations 1996

Approval is only considered if the carer belongs to a “Prescribed Entity”

Approval is subject to very strict conditions

1. Approval is limited to drugs listed in the schedule
2. The drugs must only be obtained from the Veterinary surgeon employed or contracted to NQWC inc
3. Drugs must only be used for sedation or euthanasia of animals on behalf of NQWC inc.
4. Drugs must be held at all times in secure locked storage at residence or approval holder’s vehicle. Keys to be kept in personal possession of approval holder

5. Records must be kept in a book reserved exclusively for such purpose and shall show the following information. Separate pages must be kept for each drug type and strength. The records must show a progressive balance

(a) Incoming stock

- Date of purchase/obtaining of restricted drug
- Source of supply of restricted drug
- Order no/Invoice no
- Type, strength and quantity of restricted drug
- Signature for receipt and supply

(b) Outgoing Stock

- Date of administration/issue
- Name and signature of authorised officer to whom issued
- Purpose of use
- Name of veterinary surgeon consulted
- Type, strength and quantity of restricted drug used
- Signature of authorised officer issuing/supplying
- Balance

All restricted drug records must be checked and initialled on a monthly basis by the veterinary surgeon employed and or contracted to NQWC inc.

All records including copies of orders/invoices must be retained for 2 years from date of last entry and must be provided on demand to an environmental Health Officer of Qld Health

6. Administration by the approval holder shall only be on the direction of the veterinary surgeon employed by or contracted to NQWC Inc. and in accordance to the protocols that have been developed by a veterinary surgeon employed by or contracted to NQWC Inc.

Where it is not practicable for the veterinary surgeon to give verbal direction to administer a restricted drug, for example where the approval holder is in a remote location - the veterinary surgeon must be contacted to review the administration of the rug within 24hrs. The approval holder must note the specifics of the review on the relevant record entry.

Furthermore, where the attached schedule of drugs includes the drug zolazepan/tiletamine (Zolatil), the approval holder shall not use or administer that drug unless in the company of another person who has a Queensland Health approval to use or administer that drug, or who has appropriate first aide training or is a veterinary surgeon.

7.The approval holder must only use the restricted drugs listed in the schedule to the approval, in accordance with the registered purpose as registered by the Australian pesticides and Veterinary Medicines Authority (APVMA) under the Agricultural and Veterinary Chemicals control Act 1994, unless used in accordance with an off-label permit granted by the APVMA.

8. This approval is affective forthwith and shall remain in force only while “the member” is performing duties on behalf of NQWC or for a period of 2 years from the date of issue unless sooner suspended, cancelled, replaced or surrendered, whichever first occurs.

In all cases where Euthanasia is warranted, carers should try to use the services of veterinary surgeons available. It is expected that these approval holders will operate mainly at night and weekends when it is more difficult to find a veterinary surgeon that will perform the service gratis. Please remember that veterinary surgeons find it hard to provide a 24/7 service to paying customers.

ACT

The licence to kill wildlife in the ACT, which the Board holds on behalf of all veterinary surgeons in the ACT, requires recording of all animals euthanased, with some exceptions: All birds, Eastern Grey Kangaroos, Brown Snakes, Blue Tongue Lizards and Longed-necked Tortoises. No wildlife carers are licensed.

NSW

WIRES has a blanket authority for trained and authorised members to euthanase animals using methods other than S4 drugs such as lethabarb barbiturates. Many macropod carers do have legal access to Diazepam and other S4 prescription drugs for use in wildlife.

Victoria

Wildlife Victoria has trained members who can euthanase animals using methods similar to N.S.W. No licence to use S4 Barbiturates.

S.A., W.A. and Tasmania

I am unaware of any licences being issued to wildlife carers for the use of Lethabarb barbiturates.

Many states have mechanisms for such licences to be issued but seem reluctant to allow it or maybe wildlife carers have not yet put up a good enough case to convince them of the legitimacy of their need.

N.T Currently there are three people holding licences from the Health Dept that allow them to hold Lethabarb and perform euthanasia. None have been granted for people with easy access to a veterinary clinic. All required a psychological evaluation and were difficult to obtain.

Euthanasia Kit for wildlife using Lethabarb

**Curves scissors, razor blade, clippers to shave hair or fur to see vein.
(\$15- \$20)**

Mosquito Forceps and rubber band for tourniquet (\$12-15)

Syringe size 3ml, 5ml, 10ml, 20ml. (20c, 25c, 30c, 1.00)

Hypodermic needles 19 x 1½ 22 x ¾ 25 x 5/8 (10c – 15c)

Supply of cotton wool balls and antiseptic for swabs

Supply of Lethabarb (\$18.00 / 100 ml) available only from your vet on presentation of Certificate of Approval to hold and use.

Sharps Container for used needles and syringes (\$4.50 – \$7.50)

Body bags for disposal of body.

Dose of Lethabarb is 1ml/2kg

Dilute for intraperitoneal administration



Small 3.8 gram possum from dead mothers pouch is euthanased because it has no chance of survival outside the pouch.

The Veterinary Surgeons Board of Queensland has this to say about euthanasing solutions. "Such products are necessarily lethal and therefore should be regarded as potentially dangerous.

The Board recommends that these products be kept securely under lock and key with limited access in the practice. The product should be removed from its secure position only during use and returned immediately after it is not required.

Similarly, when used in the field, the product should be securely locked away in vehicles and access by clients and by the public made impossible. Staff members should also have access only if it is necessary.

As products used for euthanasia can have the same effect as a firearm, the storage of these products should parallel that of a firearm. It would be irresponsible to leave a firearm lying around in the surgery or on the back seat of the car. Equally, these products require a great deal of care in handling and storage."

Information obtained from

- 1. AVMA (1993) Report of the American Veterinary Association Panel on euthanasia. *Journal of the Veterinary Medical Association*, 202: 229-249. Copies available on website**
- 2. Aust Gov dept Agriculture, Fisheries and Forestry
[DAFF Home](#) > [Product Integrity / Animal and Plant Health HOME](#) > [Animal Welfare](#) > [National Consultative Committee on Animal Welfare](#) > [Position Statements](#) > **Rescue and rehabilitation of sick; injured or orphaned wildlife****
- 3. Draft 'Minimum Standards for Wildlife Rehabilitation in Western Australia By Department of Conservation and Land Management
http://www.calm.wa.gov.au/plants_animals/pdf_files/min_stds_wa_man_dft_080606.pdf**
- 4. Policy document Health (Drug and Poisons) Regulations 1996
Issue of approvals for Veterinary Purposes

<http://www.health.qld.gov.au/phs/documents/ehu/29600.pdf>**
- 5. Queensland Animal Care and Protection Act 2001 as revised and Reprinted revised 2B March 2005

<http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/A/AnimalCaPrA01.pdf>**

6. MANAGEMENT OF CRITICALLY ILL WILDLIFE

The reality and practice of wildlife euthanasia by Dr Jon Hanger and Dr Andrew Tribe NWRC Sydney 2004

7. NH&MRC Australian code of practice for the care and use of animals for scientific purposes 1997.

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**The following is a poem that I find sums up the euthanasia situation
and can be equally applied to wildlife**

IF IT SHOULD BE - anon

**If it should be that I grow frail and weak
and pain should keep me from my sleep;
then you must do what must be done,
For this last battle can't be won**

**You will be sad - I understand;
Don't let your grief then stay your hand.
For this day, more than the rest,
your love and friendship stands the test**

**We've had so many happy years,
what is to come can hold no fears.
Would you want me to suffer?
So when the time comes - please let me go.**

**Take me where my needs they'll tend
only stay with me until the end.
And hold me firm and speak to me,
until my eyes no longer see.**

**I know in time that you will see,
it is a kindness that you do to me.
Although my tail it's last has waved,
from pain and suffering I have been saved.
Do not grieve it should be you,
who must decide this thing to do.
We've been so close, we two, these years -
Don't let your heart hold any tears**

Directions for Humane Destruction of Animals

ISSUED BY THE R.S.P.C.A. (Vic)

These directions show the spot on the animal's head where an instrument should be placed or pointed and the angle at which it should be held, so as to obtain the right results.

HORSE: Draw an imaginary line from the base of each ear to the opposite eye, the intersection of the lines being the centre which, if hit, insures instant loss of consciousness. When using a revolver, place it within a few inches of the head; with a rifle a short range of a couple of feet is best.

BULL: Draw an imaginary line from each horn to the opposite eye, the intersection of the lines being the point which should be aimed at.

DOG: Shoot at the point marked X in the forehead, or if the dog is suspicious shoot at a point midway between the ears in the centre of the back of the head.

SHEEP: Shoot at a point in the centre of the forehead one finger's width above the eyes or at a point midway between the ears in the centre of the back of the head.

PIG: Shoot at a point one finger's width above the level of the eyes.

CALF: Shoot at a point two finger's width above the eyes or at a point midway between the ears in the centre of the back of the head.

KANGAROO: Draw an imaginary line from the base of each ear to the outside point of the opposite eye, the intersection of the lines being the point which should be aimed at. Alternatively, shoot from the side at a point at the base of the ear.

WOMBAT: The brain is very small. Shoot downwards to a point midway between the ears.

