# ANIMAL EUTHANASIA

## Introduction

When efforts to prolong the life of a beloved pet serve only to prolong death, euthanasia (a Greek for good death) should be considered. Veterinarians have the means, and training to put animals, which are beyond treatment and recovery to sleep humanely. It meaning production of quiet, painless death in an animal for humane reasons. It is performed for, the hopeless case (treatment is ineffective and animal suffering pain), animal having behavior problems, animals their owners no longer wish to own the said animal. The veterinarians should present the alternative and try to give the client the facts upon which to make a decision and they should not advocate or recommended euthanasia in any specific case.

- *Personnel administering a euthanatizing agent must know*
- *a) Agent:*
- Whether the agent is appropriate for the species.
- What route, dose or concentration the agent should be administered.
- If the agent may result in fear behavior, struggling or vocalizations.
- If the agent causes tissue changes.
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- *b) Method:*
- The technical skills for appropriate administration.
- The method should produce death without pain.
- The time to produce unconsciousness and death should be short.
- The method should be reliable.
- The method should be minimizing undesirable psychological stress.
- The method should be compatible with its purpose.

- It should minimize the emotional effect upon observers and operators.
- The method should be economically feasible.
- The method should have a restricted environmental impact.
- The method should be safe for the personal involved.

## Methods of Euthanasia

- The selection of the method of euthanasia is dependent upon the species, available means of control, number of animals, economic considerations and the wishes of the owner.
- The ideal euthanasia method involves sedation prior to death.
- The various agents that sedate or anesthetize animals prior to euthanizing include tranquilizers, barbiturates, carbon dioxide and inhalant anesthetics.
- Once the animal is sedated/anaesthetized, any number of methods can be used to euthanaize, i.e. cervical dislocation, decapitation, various chemicals and physical agents.
- To assure euthanasia sufficient attention must be given to assure the cessation of heart beats or the lungs be collapsed.

*Inhalant agents*

Enflurane, isoflurane, ether, cyclopane, nitrous oxide, carbon monoxide, carbon dioxide, halothane, methoxyflurane, hydrogen cyanide, nitrogen and anesthetics.

*Non-inhalant agents*

It includes pharmacological agents as barbiturates, chloral hydrate, strychnine, hydrocyanic acid, magnesium sulfate and curariform drugs.

The preferred route of administration of the noninhalants is by intravenous injection.

*Physical methods*

Electrocution, shooting (gunshot), captive bolt pistol, cervical dislocation, decapitation, microwave irradiation and rapid freezing.

- **1- Inhalant agents**

***a) Inhalant anesthetics***

- As chloroform ether, halothane, and methoxyflurane. Are used for pups and kitten.
- Method
- The animals are confined in a small, closed chamber.
- Place cotton or gauze saturated with the anaesthetic liquid.
- The animal inhales the vapors until death ensures.
- *Advantages*
- Valuable in young animals where veinpuncture is difficult.
- *Disadvantages*
- The struggling and excitement.
- The stimulation of the CNS during the induction stage.
- Ether is flammable.
- Chronic exposure to chloroform, halothane or methoxyflurane is injurious to personnel.
- Halothane or methoxyflurane are expensive.
- Ether and chloroform are not acceptable methods for sedation, anesthesia or euthanazing, unless that method is part of the research objective.

## *b) Carbon Monoxide*

a)Carbon monoxide can be effectively used for the euthanasia of small ani
including dogs and cats provided that proper equipment is available and adeq
safety precautions are observed.

- Inhalation of pure CO causes rapid and painless death.
- It converts the hemoglobin to carboxyhaemoglobin and causes an anemic anoxia.
- Method
- Chemical interaction of crystals of sodium formate and sulfuric acid.
- Exhaust fumes from engine combusting petroleum.
- Use of cylinder gas.
- The animals are placed in a closed chamber.
- 6% carbon monoxide concentration gives the fastest results.
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- *Precautions*
- Personnel using the gas must be thoroughly instructed in its use and understand the hazards and limitations.
- The lethal chamber must be equipped with internal lighting and view ports.
- The gas generation process should be adequate to achieve the desired CO concentration throughout the lethal chamber.

***C) Carbon dioxide***

- Carbon dioxide (CO2) is heavier than air and nearly odorless
- In low concentration (7.5%) it is an analgesic (pain reliever). At medium concentration (30-40%) it can be used as an anesthetic, causing rapid loss of consciousness without struggling, distress or excitation. At high concentration, more than 80% causes quick death.
- High concentrations, however, painfully irritate eyes and the respiratory tract, so it is important to first induce an analgesic effect, then bring about deep anesthesia (within 1-2 minutes) before exposing the animal to high concentrations.
- Carbon dioxide has been effectively used to euthanise most small laboratory animals such as mice, rats, guinea pig, reptiles, amphibians and rabbits.
- The combination of 40 % carbon dioxide and 3 % CO is relatively cheap, noninflammable, nonexplosive, and odorless and presents no hazard to the operator.

***D) Hydrogen Cyanide (***It should not be used for euthanasia***)***.

- **2- Non-inhalant agents**

**Barbiturates**

- Any of the barbituric acid derivatives can be used in excessive dosage to produce euthanasia of individual dogs, cats and other small animals.
- The barbiturates depress the respiratory center.
- The barbiturates are generally given intravenously. Intrathoracic, intracardiac or intraperitoneal injection may be employed.
- Pentobarbital sodium is often used for euthanasia in small animals in dose 27 mg per pound for I/V and 40 mg per pound for intrapleural or intraperitoneal injection or it can be given orally in bait to vicious animals. It produces death in quietly and animal appears to go to sleep naturally.

- **Chloral hydrate**
- It is used for euthanasia in large animals.
- It fatally depresses the respiratory centers.
- It is not recommended for use in small animals because of its slow action and death is preceded by unpleasant manifestations such as crying, muscular spasms and gasping.
- The fatal dose is 1 mg per five pounds in horses and is given I/V.
- It is relatively inexpensive.
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**Strychnine**

- *Strychnine in any form should not be used for euthanasia for any animal* because it increases the excitability and produces violent muscular contractions, which produce excruciating pain.

**Hydrocyanic acid**

- HCN acid causes histotoxic anoxia and paralysis of the tissue enzyme system.
- *It is not recommended for euthanasia because:*
- Death appears to be painful.
- It produces muscular tetany and the animal cries loudly before becoming unconscious.

**Magnesium sulfate**

- The magnesium ion depresses all parts of the central nervous syst unconsciousness occurs prior to fatal respiratory paralysis.
- It is used for small and large animals.
- Saturated solutions (1:1) of magnesium sulfate should be injected intravenously or intracardially in very small animals.
- The temperature of the solution should be around 40 to 50 C at the time of injection.
- Magnesium sulfate solution should be injected rapidly to produce a lethal concentration of magnesium sulfate ion in blood.
- Dosage for euthanasia depends upon the concentration of the solution, rates of injection and the condition of the animal. Magnesium sulfate should be administered until euthanasia is produced.
- Doses 10 ml for small animals, 30 ml for large dogs and 0.5 g per pound body weight.
- Magnesium sulfate is inexpensive and does not produce excitement.

- **3- Physical methods**

**Electrocution**

- Electrocution as a form of euthanasia has been used for various species of animals.
- *Method:*
- The usual procedure for electrical destruction of cats is to pass on alternating current from the forefeet to hind feet for about one minute, with an open-circuit voltage of 500 or 1000 volts.
- In this method the current passes through the thorax but not through the head and brain.
- Small currents cause death by asphyxiation, while larger ones produce ventricular fibrillation.
- Experiments in dog and man have shown the necessity of directing the electrical current through the brain in order to produce unconsciousness.
- The method of electrocution, which does not stun may include a period of at least 12 seconds of intense pain; this pain may cause the animal to faint or electrical curarisation in which the muscles are paralyzed.
- It is possible to electrocute individual animals relatively humanely.
- Electrocution can not be used for mass euthanasia because of the time required to deal with each animal.
- Electrocution is aesthetically objectionable.

**Shooting**

- Accurate and careful shooting is the most humane and the most [illegible] method for euthanasia. Almost any gun that fires a projectile can be [illegible].
- A shotgun is preferable to a rifle.

*Method*

- The target point for the most species can be located by drawing imaginary lines from each ear to the opposite eye.
- Where the lines intersect in the middle of forehead is the proper target point.
- The gunman should stand at a distance of five to eight feet.
- Instantaneous unconsciousness is produced if the projectile is accurately placed to enter the brain.
- For dogs and cats the captive-bolt pistol is employed with the barrel and held against the target spot.
- Shooting causes excessive hemorrhage and may be objectionable to the owner of the animal.
- Adequate precautions must be taken the assure the safety of operating personnel.

- **Cervical dislocation & decapitation**
- It is used if the animal cannot be sedated prior to euthanasia.
- Methods to use only on poultry, other small birds, mice, rats weighing less than 200 g., rabbits weighing less than 1 kg, other small amphibians, fish and reptiles.
- Personnel giving the responsibility for performing the technique are properly trained and consistently apply them humanely and effectively.
- Decapitation machine must be kept clean and sharp.