Euthanasia in Wildlife Rehabilitation

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Euthanasia is the act of inducing a painless death using humane techniques. The decision to euthanize an animal is often difficult. Although each case is unique, the Colorado regulations covering wildlife rehabilitation (Chapter 14) establish general considerations and criteria for euthanasia of wildlife. Specific references to euthanasia are found in the following excerpts from Colorado regulations:

#1405 - Care, treatment, and disposition of wildlife

B. If the rehabilitator or DVM determines that any wildlife is not likely to survive, it must be euthanized immediately by the DVM or rehabilitator.

C. As soon as it can be determined that sick or injured wildlife is not likely to recover within 180 days, it must be euthanized, unless prior Division approval is given for extended care.

F. Any DVM, licensed wildlife rehabilitator, full time employee of the Division, Peace Officer as defined in 18-1-901 (3) (1) (1986), Animal Control Officer or anyone else authorized by the Division may euthanize injured wildlife when such person determines that no other reasonable action would be practical, humane or effective for the rehabilitation of the wildlife.

G. Factors that shall be considered in determining what action should be taken relative to injured wildlife include:

1. Type, extent and severity of injury(ies).

2. Physical condition of the injured wildlife.

3. Any other relevant factors which show that no other reasonable action would be practical or effective for the rehabilitation of the animal involved.

H. Any person euthanizing wildlife using chemical agents which have the potential to cause secondary poisoning must provide for appropriate burial, incineration, or other lawful disposition of such wildlife.

#1407 - Restricted Species

A. Any rehabilitator licensed for State or Federally listed threatened or endangered species must notify the Division within 48 hours after receiving; after release; and prior to euthanasia of these species.

These guidelines can assist in determining when euthanasia should be performed, but another difficult decision is the method of euthanasia to use. The euthanasia method should provide the least distressful and painful death to the animal and afford safety to humans involved. Wildlife rehabilitators should work with fellow wildlife rehabilitators, veterinarians, Division of Wildlife personnel, and others to determine appropriate euthanasia techniques for the species and circumstances that are commonly encountered. Here, we will review some of the basic considerations in euthanasia of wildlife.

Initial depression of the central nervous system, specifically the cerebral cortex, is required to ensure insensitivity to pain. Therefore, to be deemed humane, a euthanasia method must induce rapidly occurring unconsciousness followed by cardiac or respiratory arrest. The American Veterinary Medical Association has evaluated methods and developed guidelines for performing euthanasia; however, these guidelines deal primarily with domestic species

under clinical conditions. In applying these guidelines to wildlife species, some modifications to the guidelines will likely be required. To assist in selection of a euthanasia method, Table 1 classifies euthanasia methods used in wildlife. This table is intended to provide general guidance in determining if techniques are preferred, acceptable, or unacceptable methods of euthanasia for specific groups of animals. Additional euthanasia methods that alone are unacceptable and inhumane in all species of animals include paralytic agents such as succinylcholine, magnesium or potassium salts, asphyxiation, exsanguination, drowning, and freezing. Final selection of the method of euthanasia will be based on degree of animal restraint, skill of personnel in performing the technique, availability of drugs, reliability of the technique, aesthetic acceptance by those involved, disposition of the carcass, and other factors.

Euthanasia Techniques

Use of an injectable euthanasia agent is a good alternative for euthanasia when an animal can be well-restrained (physically or with sedatives) for intravenous or intracardiac injection. Intraperitoneal injection of euthanasia agents is controversial. Euthanasia agents are reliable, fast acting, and less aesthetically displeasing to observers than many other methods of euthanasia. However, availability of barbiturates, such as sodium pentobarbital, are limited to persons (veterinarians, physicians) registered with the United States Drug Enforcement Agency (DEA) to handle controlled drugs. Unfortunately, no non-barbiturate euthanasia drugs (such as the discontinued T-61) are currently on the market.

Euthanasia of small to medium-sized mammals and birds may be performed by exposing animals to inhalation of toxic gases or an overdose of inhalant anesthetics. Carbon dioxide (CO_2) from a gas cylinder or from dry ice can be introduced in a special chamber or a cage covered in a plastic bag. CO_2 is heavier than room air and a non-airtight container should be used so that the CO_2 will displace the room air in the container. Animals should be left in the chamber for several minutes after movement has ceased to assure death. Inhalation of CO_2 by humans can be unpleasant and should be avoided. Use of carbon monoxide (CO) gas is not recommended without special equipment due to the significant human health risk. Unfiltered CO, from sources such as car exhaust, are not acceptable due to their associated irritation and discomfort to animals. Exposure of small mammals, birds, and herptiles to an overdose of an inhalant anesthetic (i.e., halothane) in a chamber or via an anesthesia machine is an acceptable method of euthanasia; however, these anesthetics must be obtained and used under the supervision of a veterinarian. Small animals can be placed in a small, relatively airtight container with a gauze saturated with the anesthetic agent. Care must be taken to avoid inhalation by humans, so preparation should occur only in a well ventilated area.

Fish and amphibians can be euthanized using tricaine methanesulfonate (MS-222) in about a 1:1000 solution with water (very roughly 1/4 tsp in 2 cups water). Amphibians can be placed in about 0.5-1 inch of the solution in a pan and the solution will be absorbed through the skin. Death will occur within approximately 15 minutes.

Many other euthanasia techniques employ physical means. When properly performed, gunshot to the brain or cervical spine with appropriate ammunition load (.22 caliber in most cases) is acceptable for euthanasia of large or poorly restrained animals. Care must be taken to accurately place the slug (Fig. 1) to assure immediate unconsciousness. Human safety precautions should be of primary concern when a firearm is used. The captive bolt pistol provides a preferred alternative to gunshot for well-restrained large animals; however, acquisition of the captive bolt pistol may be impractical.

Cervical dislocation can be used by experienced persons to euthanize small to medium-sized birds or small mammals. The head should be separated at the base of the brain or within the upper third of the neck (cervical spine). In small birds or mammals this can be done by grasping the base of the skull in one

hand and the body, usually at the base of the neck, in the other hand. By pulling firmly and rapidly in opposite directions the cord will separate. Decapitation is used primarily in birds, such as turkeys or geese, that are too large for cervical dislocation. The bird should be well restrained and the head severed from the body in the upper third of the neck using a hatchet or bolt cutters. Following decapitation or cervical dislocation, birds will show uncontrolled muscle movement for several seconds or minutes after death. This movement is due to spinal reflexes, not a response to pain.

Because deeply anesthetized animals do not perceive pain, some otherwise unacceptable euthanasia methods can be employed if an animal is placed under a surgical plane of anesthesia. Birds can be euthanized by asphyxiation (holding tightly around the body for several minutes) and mammals by exsanguination (severing major blood vessels in the neck) if proper procedures for anesthesia are followed. Animals can be injected with high doses (overdoses) of immobilization drugs such as a ketamine (100 mg/ml) and xylazine (100 mg/ml) in a 5:1 mixture. These drugs must be obtained from, and used under the direction of, an veterinarian; however, general overdosages of the drug mixture are about 20 mg/kg (1 ml mixture/10 lbs) for small to medium-sized animals and about 10 mg/kg (0.5 ml mixture/10 lbs) for larger animals. After injection the animal should be given >15 minutes for complete induction of anesthesia. Euthanasia should be performed only when a deep plane of anesthesia, as evidence by lack of movement, no response to stimuli, pupillary dilatation, and lack of blink response, is obtained.

Regardless of the method of euthanasia used, prior sedation or application of a blindfold should be considered as an adjunct when feasible to minimize distress to the animal. Death should be confirmed after application of the euthanasia method. Verification of death can be particularly difficult in herptiles. Lack of movement of the body (including chest movement associated with respiration), lack of corneal eye reflexes, and lack of heart or lung sounds on auscultation with a stethoscope are good indicators of death. To assure that death occurs, a pneumothorax can be induced by making a full thickness cut between two ribs that extends through the skin into the chest cavity of a mammal. Carcasses are not fit for human consumption if the animal received any drugs (e.g., sedatives, antibiotics, euthanasia agents). If a euthanasia drug was used, the carcass must be disposed of properly to avoid secondary poisoning in a scavenger species.

Table 1. Group-specific classification of euthanasia methods for wildlife in field settings as preferred (P), acceptable (A), or unacceptable (U).

Species group	Gunshot[1]	Decapitation	Cervical dislocation	CO_2	Inhalant anesthetic	Barbiturate overdose	Anesthetize & euthanize
Ruminants	P	U	U	U	U	P	A
Raptors	U	U	U	A	A	P	A
Other birds	U	P	P[2]	P	P	A	A
Large carnivores and bears	P	U	U	U	U	P	A
Small rodents (<500 g)	U	A	P	P	P	A	A
Small to medium sized mammals	A	U	U	P	P[3]	P	A
Amphibians	U	A[4]	U	A	P	P	A[5]
Reptiles	A	A[4]	U	A	P	P	A

[1]Human safety precautions must always be exercised

[2]Not recommended for large species (turkeys, geese)

[3]Acceptable only for smaller species

[4]Pithing should follow decapitation

[5]Tricaine methanesulfonate (MS-222) is a preferred method