

Euthanasia

Background

Euthanasia means to cause humane death. Some current euthanasia techniques may become unacceptable over time and be replaced by new techniques as more data are gathered and evaluated. The following information and recommendations are based largely on the 1993 report of the American Veterinary Medical Association (AVMA) Panel on Euthanasia. The recommendations in the panel report were intended to serve as guidelines, and they require the use of professional judgement for specific situations. Ultimately, it is the responsibility of those persons carrying out euthanasia to assure that it is done in the most humane manner possible.

There is no perfect euthanasia technique appropriate to all situations. What is sought in each instance is immediate insensitivity of the animal to pain as a result of depression of the central nervous system (brain and spinal cord). The AVMA panel in its evaluation considered the following to be important factors to consider when selecting a euthanasia method:

Considerations for selecting a euthanasia method

- Does the method cause the animal to lose consciousness and die without causing the animal pain, distress, anxiety, or apprehension?
- How much time does the method require to induce unconsciousness?
- Is the method reliable?
- Does the method put personnel at risk of injury or health problems?
- Is the method irreversible?
- Is the method compatible with the purpose of euthanasia?
- Will the method cause distress and anxiety among observers and personnel?
- Does the method interfere with or detract from the subsequent evaluation, examination, and use of tissue?
- Are drugs required by the method available? Can the drugs be abused by humans?
- Is the method appropriate for the animal age and species?
- Is the equipment required by the method in proper working order?
- Is the method cost-effective?

Methods of euthanasia are physical or chemical. Physical methods of euthanasia include cervical dislocation, decapitation, stunning and removal of blood, and gunshot. Chemical methods of euthanasia involve introducing a toxic agent into the body by injection or inhalation. After completing euthanasia, be certain that specimens being collected are properly identified, preserved, and packaged for transportation to the diagnostic laboratory (see Chapter 2, Specimen Collection and Preservation, and Chapter 3, Specimen Shipment). Be sure to indicate the euthanasia technique used.

Physical Euthanasia

Cervical Dislocation

Cervical dislocation can be used without any special equipment to euthanize small birds and ducks. The dislocation must take place at the base of the brain, or within the upper one-third of the neck (the cervical spine). Grasp the base of the bird's skull in one hand and its body, usually at the base of the neck, in your other hand. Pulling rapidly and firmly in opposite directions will separate the spinal cord (Fig. 5.1). Cervical dislocation can be used for larger birds, like geese, by separating the upper cervical spine with an emasculator, which is available from veterinary supply

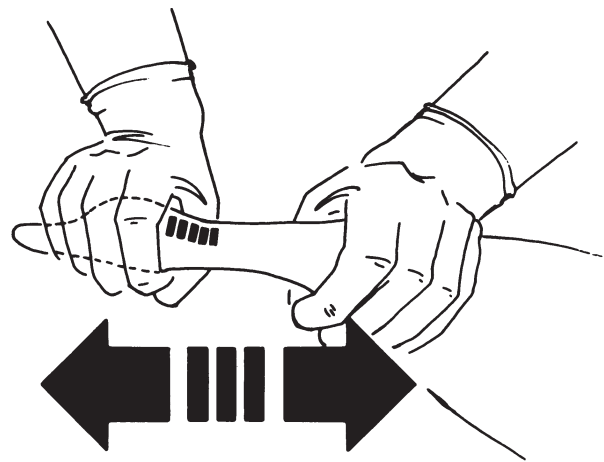


Figure 5.1 Cervical dislocation procedures. The brain can be separated from the spine in small- to medium-sized animals by grasping the animal at the base of the skull with one hand, at the base of the neck with the other, and pulling rapidly and firmly in opposite directions with a strong snapping action.

stores. As with all methods, learn how to properly use this instrument before applying it to a live animal.

Cervical dislocation may upset the casual observer because animals, especially birds, convulse for several seconds to minutes after death. These movements are due to spinal reflexes and the animals do not feel pain. This technique is effective, rapid, inexpensive, and only minimally affects diagnostic testing.

Decapitation

Severing the head from the neck is an effective method of euthanasia for small mammals and any size bird, but it is often used for larger waterfowl. Use a knife, machete, hatchet, or bolt cutters to ensure that the spinal cord, encased in the cervical spine, is severed. The same convulsions seen after cervical dislocation will follow decapitation. This technique has similar attributes as cervical dislocation. However, take care to prevent injuries to personnel resulting from the use of the sharp implements, and to prevent exposing personnel to toxic or infectious agents that may be in the blood.

Stunning and Exsanguination (Removal of Blood)

This method requires striking the center of the skull to render the animal unconscious, followed by severing the major blood vessels in the neck, and allowing the animal to bleed out. Do not use this technique if the brain is required for diagnostic tests.

Gunshot

Shooting animals in the head, or the neck if the brain is needed for diagnostic purposes, with a small caliber rifle can be used as a method of euthanasia. Training and experience are required to assure a humane death, and also to reduce the human safety hazards.

Chemical Euthanasia

Extreme caution is required for the use of chemical euthanasia, because of the potential hazards for humans. These procedures should be carried out only by trained individuals who are properly authorized to use the appropriate chemicals.

Inhalant Anesthetics

Several inhalant anesthetics have been used for wildlife euthanasia. Halothane is often the inhalant selected because it rapidly induces unconsciousness. Enflurane also rapidly induces unconsciousness, but seizures under deep anesthesia from enflurane are more common than from halothane. Methoxyflurane vaporizes slowly and, therefore, has a longer anesthetic induction time, which can cause the bird to become agitated. Isoflurane has a rapid induction time, but its odor can cause the animal to hold its breath, thereby delaying unconsciousness. Nitrous oxide has a low potency and is available only in gas form; other anesthetics are purchased as a liquid, and they vaporize at room temperature and nor-

mal air pressure. Nitrous oxide can be used in combination with other inhalants to speed anesthesia, but it should not be used alone because animals often become agitated and distressed before they lose unconsciousness.

To administer an inhalant anesthetic for euthanasia of an individual bird, prepare a cone (from a syringe case or other plastic material) that will fit snugly when it is placed over the beak and nares (Fig. 5.2). Pour a small amount of the anesthetic agent on a piece of cotton, tissue, or cloth, and place it in the narrow part of the cone. Restrain the bird; put the open end of the cone over the beak and nares, and continue restraining the bird until it becomes unconscious. Restraint can then be discontinued, but keep the cone in place for several minutes before checking to assure that the bird is

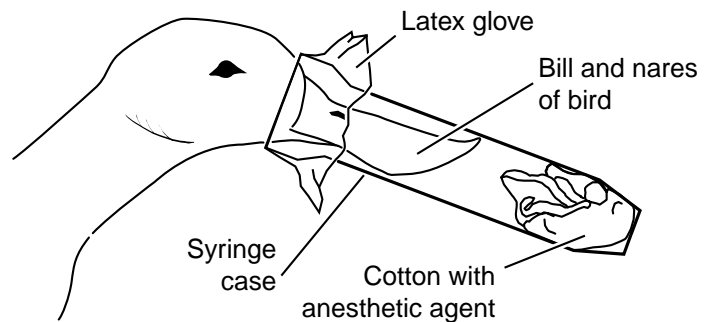


Figure 5.2 A cone prepared from an empty syringe case can be used for euthanasia. Tape a piece of latex glove over the open end of the cone, and cut a slit in the latex so that the bill and nares fit through it. Place the anesthetic agent on a piece of cotton in the end of the cone.

dead. Alternatively, place an individual bird, or several small birds, in a cage or crate; cover it with plastic or place the cage in a covered plastic barrel. Place the cotton, tissue, or cloth soaked with anesthetic agent inside the chamber with the birds and tie or otherwise seal the plastic to prevent the vaporized agent from escaping (Fig. 5.3). Cold temperatures will decrease the rate at which the liquid becomes gas. Small mammals can be euthanized by similar procedures.

A animal exposed to anesthetic gas may pass through an “excitation phase” before it becomes unconscious; it may vocalize and appear to struggle for a short time. This behavior may be distressing to the casual observer and it can be dangerous for the handler, depending on the species. It is important to assure that the animal is dead, and not just unconscious, before shipment, necropsy, or disposition. After removing the animal from the gas environment, it may wake up quickly, with little warning. Remember this when working with raptors, carnivores, and other biting animals.

Because all of these gases constitute a human health hazard, including the potential to cause spontaneous abortion and congenital abnormalities, the workplace must be well-ventilated.

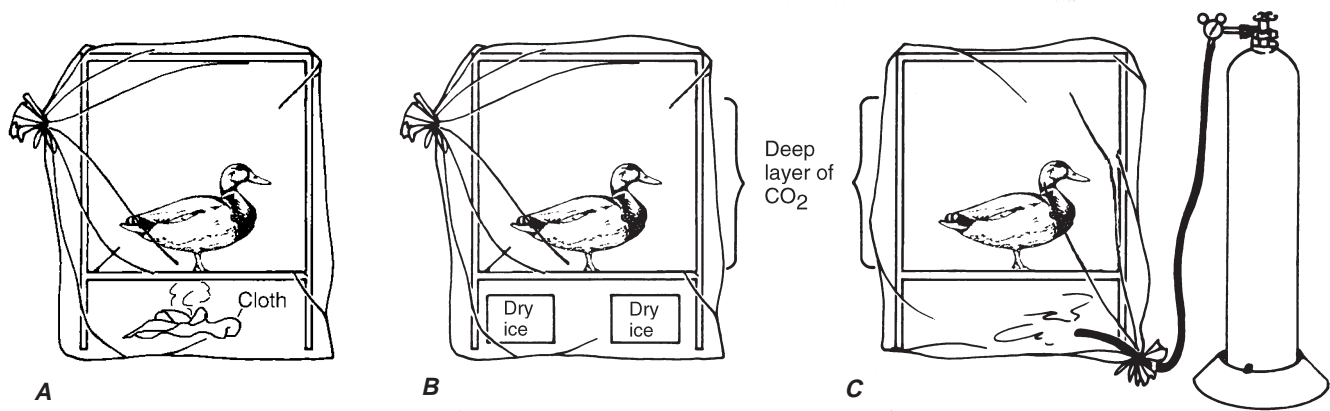


Figure 5.3 Use of cage enclosed with plastic for euthanasia of birds. **(A)** Anesthetic agent placed on a piece of cloth under the cage. **(B)** Evaporation of dry ice. **(C)** Direct application of carbon dioxide gas. Because this gas is heavier than air, a deep layer of gas must be built up so that the animals being euthanized cannot get above the gas. The chamber containing the animals must not be airtight or gas buildup may result in an explosion. Openings should be at the top of the chamber.

Toxic Gas

Toxic gases such as carbon monoxide (CO) or carbon dioxide (CO₂) may be useful when many small birds or animals must be killed. Keep in mind that, even at concentrations of less than 1 percent, carbon monoxide is lethal and represents a substantial human safety hazard because it is highly toxic and difficult to detect. In concentrations exceeding 10 percent, carbon dioxide can be flammable and explosive. Work with this gas, as with anesthetic gases, must be conducted in an open area away from electrical equipment.

Carbon monoxide and carbon dioxide may be purchased as compressed gases in cylinders. Dry ice can also be used as a source of carbon dioxide. If dry ice is used, protect animals from contact with it. Cages covered with plastic bags (Fig. 5.3) or plastic garbage cans can be used as killing chambers, but the cages must be vented to allow displacement of air within the chamber by the toxic gas. Leave the animals in the chamber until breathing and heartbeat have ceased.

Lethal Injection

To administer lethal injections, personnel must be trained in injection techniques and proper doses as well as in the safe handling and disposal of needles, syringes, and drugs. Federal drug regulations make the use of these agents, except by licensed veterinarians, largely impractical. Lethal injections can be used for any animal that can be given an intravenous injection, but they are probably most useful for mammals and large birds, such as geese.

Sleepaway® (made by Ft. Dodge Laboratories, Inc., Ft. Dodge, Iowa) and Beuthanasia – D Special® (made by Burns-

Biotic Laboratories, Inc. Omaha, Neb.) are concentrated barbiturate solutions plus additives. The solutions are inexpensive, but, due to the potential for human abuse, require licensing by the Federal Drug Enforcement Administration (DEA) for purchase, use, and storage. Considerable record-keeping of use of the drug is required by the DEA.

Lethal injections may not be appropriate in certain instances because drug residues interfere with some tests. Check first with the diagnostic laboratory to see if the proposed euthanasia technique is compatible with the testing to be performed.

The need for individual handling and injection of each animal generally precludes using this technique for euthanasia of more than a few birds or animals per event. Proper disposal of carcasses is needed to prevent secondary poisoning of scavenger species in situations where more birds or animals are euthanized than are needed for diagnostic testing.

J. Christian Franson

(Modified from an earlier chapter by Patricia A. Gullet)

Supplementary Reading

Andrews, E.J., Chairman, 1993 Report of the American Veterinary Medical Association panel on euthanasia, 15 January 1993: *Journal of American Veterinary Medical Association* 202:229–249.

