

Birds

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Avian veterinarians are charged with caring for companion birds, laboratory birds, poultry, and wild birds. Veterinarians are often faced with the need to euthanize birds in order to relieve suffering with minimal pain and distress. It is imperative that the veterinarian be knowledgeable and skilled in appropriate euthanasia techniques appropriate to the species. These caveats also apply to non-veterinary personnel that perform euthanasia under remote field conditions or during emergencies, such as during disease control programs or following environmental disasters.

The choice of euthanasia method for birds should ensure, to the best degree possible, that loss of consciousness occurs quickly, without apprehension or distress, and that the method is reliable and irreversible. The method should also be safe for personnel to administer.

To a large extent, the choice of euthanasia method for birds depends upon the type of bird and the setting. For example, individual avian patients in a clinical or research setting may be handled differently from flock or aviary animals. Birds encountered in field settings may need to be handled with another set of euthanasia protocols.

INDIVIDUAL BIRDS IN A CLINICAL OR RESEARCH SETTING

The choice to euthanize a bird should be approached carefully. The welfare of the bird should always guide the process. Owners, if present, should be prepared for what will happen. The veterinarian should be prepared to

provide supportive and sensitive communication and options to the owner. Veterinarians and their staff also may be affected by both the emotional considerations of euthanasia and with the ethical dimensions of euthanizing a particular bird. Ethical and legal considerations will be especially prominent for birds representing endangered or threatened species.

Chemical Methods of Euthanasia

A number of protocols may be used in a clinical setting, particularly in birds that are ill and when owners want to be present during euthanasia. Injectable forms of butorphanol are recommended to reduce pain and distress in clinical and research settings.

Inhalants

Inhalants may be used as premedications for euthanasia at the discretion of a knowledgeable veterinarian. Inhalant anesthesia allows for immobilization and a smoother plane of anesthesia because using barbiturates as the sole agent for euthanasia may otherwise result in wing flapping, a perception of struggling, other untoward movements, or vocalizations. Acceptable inhalant anesthetic agents include isoflurane and sevoflurane.

Barbiturates

A wide range of barbiturates are available for performing euthanasia. Dosage of barbiturates will vary on species, age, and health status of the bird. Barbiturates can precipitate in

tissues and administration of barbiturate doses significantly above those needed to cause death can adversely affect post-mortem pathology.

The veterinarian (or trained personnel under the direction of a veterinarian) should be experienced in administering barbiturates in birds. The barbiturate overdose may be administered by intravenous, intraosseous, or intracardiac means or by injection into the liver or muscle. Barbiturates commonly used for parenteral administration are available as sodium salts that are alkaline and can irritate tissues thereby resulting in pain. Therefore, intravenous administration of barbiturates is preferable, when possible. Intracardiac injection of barbiturates is difficult if the clinician is not practiced in the technique and may be offensive to an observing owner. Birds should be deeply anesthetized before intracardiac or intraosseous injection. Intracoelomic administration is not recommended as barbiturate absorption via this route is delayed due to the presence of air sacs.

Gentle restraint and careful handling should be used during euthanasia. The choice will vary depending on the bird (e.g., canary or ostrich), but restraint should be performed by a knowledgeable person to avoid distress to the bird or injury to either the bird or personnel. The bird should be monitored during euthanasia to monitor the process and ensure its proper administration. It is also essential that death be verified after euthanasia to avoid inadvertent disposal of a living bird that is in deep narcosis.

FLOCK OR AVIARY SETTINGS

In small numbers, birds from an aviary setting may be handled as individual avian patients; however, it may not be practical to employ methods used for individuals on occasions where multiple numbers of birds need to be euthanatized. Positive test results for infectious diseases such as Exotic Newcastle's disease or avian influenza may require destruction of an entire aviary or flock. In such cases, large numbers of birds will need to be euthanatized.

Chemical Methods of Euthanasia

Inhalants

Halothane, Isoflurane or Sevoflurane

In flock or aviary settings, a large, closed chamber containing halothane-, isoflurane- or sevoflurane-saturated cotton is preferred. Halothane is not advised for the anesthesia of birds due to its narrow margin of safety, and may therefore be selected for euthanasia on this basis and because of its reduced cost, compared to other inhalant anesthetic agents. For social bird species where multiple individuals can be placed in the chamber simultaneously without causing distress, multiple animals can be simultaneously and humanely euthanatized with this method. The expense of this method for flocks or for birds with larger body sizes is a consideration that may limit its use.

Carbon Dioxide and Carbon Monoxide

Carbon dioxide (CO₂) and carbon monoxide (CO) are both used to euthanize birds in flock or aviary settings and can be used under field conditions. Regardless of which is used, they should be administered from compressed gas cylinders in order to regulate inflow to chambers with precision and to ensure adequate rapid effective gas concentrations.

Administration of CO₂ requires complete filling of a chamber that can contain the CO₂ at a high concentration without dilution from the environment. As CO₂ is heavier than ambient air, failure to completely fill the chamber can permit some birds to avoid exposure by breathing air at the top of the chamber. Carbon dioxide is effective with small sized birds. Hatchling birds are more resistant to the effects of anoxia and will require higher concentrations of CO₂ for a longer period of time (Reilly, 2001). Euthanasia with CO₂ may take more time than other methods. Carbon dioxide induces involuntary violent respiratory efforts in birds after loss of consciousness, and this may be unacceptable for observers.

Special safeguards must be taken with CO to prevent exposure to personnel because it is lethal, odorless and cumulative in effect at

relatively low levels (AVMA, 2001). Efficient exhaust or ventilation systems that disperse CO to well ventilated areas should be used to avoid exposure. Personnel should be knowledgeable about the risks of CO and trained in its proper administration. Carbon monoxide can become explosive if concentrations exceed 10% (AVMA, 2001), so gas levels should be carefully monitored. European (Close et al., 1997) and AVMA (AVMA, 2001) euthanasia guidelines highlight the dangers of CO to personnel, and CO euthanasia of birds is not considered acceptable under Australian and New Zealand euthanasia guidelines (Reilly, 2001). Therefore, CO euthanasia of birds should be considered only under rare circumstances where alternatives are not acceptable.

Physical Methods of Euthanasia

Cervical Dislocation

For nondomestic, small birds (<100 grams in weight), cervical dislocation may be used as a method of euthanasia. Personnel must be trained and proficient in the technique (Close et al., 1997; Reilly, 2001).

FIELD SETTINGS

In working with wild birds, a wide range of species may be encountered under dynamic field conditions. Capture techniques sometimes lead to injuries, and captured birds might sustain injuries that prevent release to the wild. While means should be sought to provide for a continued, comfortable existence for injured wild birds, this may not always be practical and euthanasia may be required. In addition, personnel may need to reduce populations of wild birds for management like limiting disease, or nuisance animal control. In such cases, field euthanasia may be required.

Wild birds range tremendously in size, which presents challenges for euthanasia. The preferred method for field settings is a large, closed chamber containing isoflurane- or sevoflurane-saturated cotton. Chambers or other enclosures containing CO₂ may also be used. In avian disease outbreaks, large numbers of poultry have been euthanatized by tenting with

plastic and gradually flooding with CO₂ until the concentration is >40% (OIE, 2005).

Where inhalants are not practical or sufficiently rapid for euthanasia, barbiturates may be administered alone, or preferably, in combination with butorphanol. Proper restraint and administration of barbiturates in wildlife species requires trained and experienced personnel, as well as appropriate permits for the use of controlled substances. The availability of controlled drugs is often limited for personnel performing avian euthanasia under field and some other circumstances, and this can limit the use of this method. Carcasses containing barbiturates, opioids and some other drugs should be disposed of such that the potential for secondary toxicity to scavengers is prevented.

Other methods may be used conditionally. Cervical dislocation may be used for birds up to 3 kg (Close et al., 1997), but alternatives should be used wherever possible to limit pain and suffering as birds are not rendered immediately insensible by this method. Decapitation offers advantages over cervical dislocation under field conditions, including exsanguination and clear evidence of a successful procedure. Concussion, if performed by trained and skilled personnel, and carried out by a hard blow to the head of birds <250 g resulting in immediate death, is conditionally acceptable where superior alternatives are not available (Close et al., 1997). Gunshot may be used in field settings to end distress and pain, but this is recommended as a last resort.

Thoracic compression has been used historically for birds in the field (Gaunt, 1999), but this method of euthanasia is not recommended due to concerns about the efficacy, prolonged duration of the procedure, the potential for distress of the bird, and the perception of pain.

EMBRYOS AND EGGS

By 50% gestation, the neural tube of avian embryos has sufficient development for pain perception (Reilly, 2001). Avian embryos older than 50% gestation must be killed using decapitation, overdose of anesthetic, or other methods considered appropriate for hatched birds (Close et al., 1997). Earlier works have not

clearly defined whether eggs younger than 50% gestation should be euthanatized according to any particular standards. Consequently, in addition to methods appropriate for euthanatizing hatched birds, freezing is presumed to be a humane method of euthanatizing avian embryos, but further consideration of this is warranted.

Under field conditions, destroying the viability of eggs ("egg addling") may be an important population control method for some species. This may entail shaking, puncturing, freezing, or coating of eggs with oil (Humane Society of the United States, 2004). Where the latter method is elected, the USDA/APHIS recommends 100% food-grade corn oil as a means of euthanatizing developing avian embryos under field conditions (USDA, 2001). Corn oil used for this application is exempt from Environmental Protection Agency regulations, and this method blocks egg shell pores and asphyxiates developing embryos with minimal impact on adults. Particular attention must be given to application method, quantity of oil applied for a given species, stage of egg development at which the application occurs, and avoidance of contact with non-target species and their eggs. It is essential that appropriate permits be obtained for any egg addling method, and that permit requirements be strictly followed.

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