

Euthanasia of Dogs and Cats with Carbon Monoxide



**Prepared by:
Companion Animals
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Euthanasia

Millions of dogs and cats are brought to public and private animal shelters annually because they are not wanted anywhere by anyone. The most humane disposition for these animals is euthanasia, which means "easy death."

Destroying unwanted animals, many of which are in good health and would make good pets, is abhorred by humanitarians, humane societies and many of the public officials in charge of animal control programs—but it will be necessary until pet owners stop their animals from breeding more and more unwanted litters.

Euthanasia is one of the most important activities at the animal shelter because the very least that can be done for unwanted animals is to put them to death gently and painlessly without causing them fear or stress.

Euthanasia of animals should be approached with the greatest care that the method used be truly humane. It should be entrusted to the most conscientious and qualified workers only—never to a shelter employee who is careless, indifferent to animal suffering or untrained in animal behavior and euthanasia techniques. The employees must be able to cope emotionally with destroying large numbers of animals while maintaining a concern for the well-being of each individual animal.

Also, it should be a binding responsibility of those in charge of shelters to check the euthanasia procedure frequently and to ensure that the animals are being properly handled and the employees are maintaining a caring attitude.

The Technician

The most important component of the shelter's euthanasia program is the employee assigned to the job. By its very definition, euthanasia demands that the person performing it be a technician, well-trained, caring and reliable.

Maintaining a balanced attitude toward euthanasia is not easy. Animal shelters find themselves in the double bind of being responsible for humanely sheltering the animals while eventually destroying most of the animals that are sheltered. Community residents expect their animal control service to keep the streets free of strays, but often show little understanding or concern for the shelter workers who must somehow dispose of these strays.

For the individual employees, it is extremely stressful to destroy healthy, playful animals that they have cared for and come to know.

The following is a section from "The Psychology of Euthanizing Animals: The Emotional Components" by Charles E. Owens, Associate Professor at the University of Alabama Department of Psychology, Ricky Davis, doctoral student in the University of Alabama psychology program, and Hurt "Bill" Smith, Director of the Animal Control Academy. It includes recommendations that shelter managers need to follow to help their employees perform animal euthanasia competently and compassionately with minimum stress on themselves.

"It is clear that euthanasia technicians need to vent their concerns about animals to the public (to get support and understanding from society at large as well as from their co-workers); to find constructive and effective methods for dealing with the feelings that accrue from killing animals; and to have a continuous support group that is not only sympathetic to their dilemma but also shares other similar professional concerns.

"There are a number of ways that animal control and animal welfare agencies can help euthanasia specialists deal with euthanizing animals and the resulting negative feelings. Some of the more obvious are:

"1) Allow time at staff meetings for technicians and other personnel to exchange their ideas and feelings on the topic of euthanasia.

"2) Arrange speaking engagements to interested groups, organizations and classes explaining their position and the public's responsibility in making euthanasia necessary. This helps the general public to understand the euthanasia technicians' dilemma and provides a chance for animal care personnel to demonstrate their concern about the animals.

"3) Encourage employees to become involved in daily activities, hobbies, and situations that allow individuals opportunities to relax and to cope with the anger, frustration, or ambivalence connected with euthanasia. This is especially important during the hours after work.

"4) Permit technicians to attend meetings that focus on both the humane and technical aspects of euthanizing animals. This helps the individual to identify with a continuing support group."

The well-being and attitude of each shelter employee is important not only for his or her own sake but also because it affects the employee's general value to the shelter and because it is critical to whether animals are being euthanized humanely.

The Carbon Monoxide Cabinet

This booklet explains how to construct and use a simple and inexpensive cabinet for euthanizing dogs and cats with carbon monoxide.

Carbon monoxide is accepted by the American Veterinary Medical Association and *can* meet the requirements of The Humane Society of the United States for humane euthanasia when:

- the carbon monoxide is properly cooled or filtered, or from a cylinder;
- the animal becomes unconscious in 45–60 seconds, and death follows in 2–4 minutes;
- the euthanasia technician receives proper instruction and supervision concerning the use of the cabinet;
- the cabinet is properly designed and maintained.

In addition, the following **restrictions** on the use of carbon monoxide must be observed:

- Puppies and kittens under eight weeks of age cannot be euthanized effectively with carbon monoxide, and thus **there should always be an acceptable backup method of euthanasia available.**
- Sick, old, or injured animals require and deserve special handling *and* individual caging within the cabinet. Because of their condition, these animals may be difficult to move. **Again, for practical and humane reasons, an acceptable backup method of euthanasia should be available.**

Animal Handling

The euthanasia technician should always be concerned with an animal's psychological stress as well as with physical stress.

To minimize the animal's anxiety and fear:

- The animal should be handled gently and quietly at all times.
- The cabinet should be lighted naturally either with use of clear plexiglass walls and/or doors, or be artificially lighted when in use.
- The cabinet should be kept clean at all times.
- The cabinet must be designed in such a way as to reduce stress and allow for species and size separation. Animals *should never be crowded together* or placed with animals already euthanized. Only compatible animals of the same approximate size and of the same species should be placed in the same compartment, and preferably animals should be caged individually.
- Cats should be placed in individual carrying cages. Lightweight, open-wire cages with metal pan bottoms are best for good air circulation.

Euthanasia by Carbon Monoxide

When an adult animal is exposed to an atmosphere with an approximate 5% concentration of carbon monoxide, its breathing brings the gas into contact with the red blood cells. Carbon monoxide is 200 times more soluble than oxygen in the red blood cell. The carbon monoxide easily attaches itself to the hemoglobin molecule in the red blood cell, greatly reducing the cell's capability to carry oxygen.

Due to oxygen deprivation, unconsciousness occurs within 45–60 seconds, and death occurs within 2–4 minutes. Studies show that concentrations of carbon monoxide higher than 5% do not expedite unconsciousness and are not necessary.

The majority of medical experts advise that this is a painless experience. This is based largely on human exposure cases that indicate a lack of awareness of the onset of the effects of the gas. These individuals reach unconsciousness, but upon recovery do not recall suffering any pain or distress prior to losing consciousness.

Because of the psychological impact on personnel, it is important that personnel comprehend fully the process of an animal's physical reaction to exposure to carbon monoxide. It should be noted that carbon monoxide causes *involuntary muscular movements including vocalization* as the animal is passing through what is called Stage II of anesthesia. *At this point the animal is already unconscious.* The first of these stages is analgesia. The majority of medical and veterinary experts feel that any reaction by the animal occurs after this stage and there is a negligible possibility of pain perception. The latter stages of anesthesia and total unconsciousness further substantiate this statement. To date, it has been virtually impossible to pinpoint precisely the exact time of unconsciousness, even with electroencephalogram (EEG) and electrocardiogram (EKG) graphs.

Engine Exhaust

If carbon monoxide generation is by combustion of gasoline in an engine, then:

- (a) The engine must be operating efficiently and only at idling speed with a rich fuel-air mixture and should not be in the same room as the cabinet.
- (b) The cabinet must be equipped with accurate temperature gauges monitored by attendants to ensure the internal temperature of

the cabinet does not exceed 90 °F (32 °C).

(c) The exhaust gas must be passed through water and cloth filtration processes to remove irritants and carbon particles before entering the cabinet. Exhaust gas piped into a compartment on a cruising vehicle is not acceptable, either by the American Veterinary Medical Association or The Humane Society of the United States.

(d) The pipe conveying carbon monoxide gas from the water filtration tank to the cabinet must be of flexible metal or rubber hose to reduce impact of combustion explosion vibrations.

Anti-pollution devices required on vehicles in the U.S. have reduced the concentration of carbon monoxide, making the exhaust less effective as an euthanizing agent.

Commercial Grade Carbon Monoxide

With cylinder carbon monoxide, there is no problem with maintenance or breakdown of a gasoline engine, and no filtering equipment is needed. Cylinder carbon monoxide of commercial grade has a purity of 98%, which virtually eliminates any irritating particles. Cylinder carbon monoxide is readily available throughout the country and will be more efficient for this model as shown in the diagram.

Equipment

1) Walls may be constructed with cinder block if surfaces are sealed and painted with epoxy. If constructed of cinder block the cabinet should be built in the open, where there is less danger of personnel being exposed to concentrations of carbon monoxide gas. It is preferable for the cabinet to be constructed of ¾" marine plywood or plexiglass and mounted on casters.

All interior corners should be sealed, or caulked, if they are to be painted. Doors should be made of ½" plexiglass. The cabinet should have a standard 8"x8" recessed light fixture mounted flush near the ceiling of the cabinet if the doors are not constructed of clear plexiglass. The fixture's glass should be replaced with clear plexiglass. A 60 watt bulb is sufficient.

Any competent millwork shop will be able to construct the cabinet from marine plywood or plexiglass. If marine plywood or concrete block is used, the cabinet should be painted inside and out with a quality epoxy paint.

A cabinet larger than the model shown in the drawing would require more bottled gas to

achieve a 5% concentration, resulting in a higher operating cost.

2) Two cylinders of carbon monoxide are needed. One is simply a back-up cylinder to be hooked up when the cylinder in use is depleted. Check the Yellow Pages under "Gas—Industrial and Medical—Cylinder and Bulk."

3) A regulator and a flowmeter are essential. These connect directly to the cylinder. The regulator turns the gas on and off, and the flowmeter indicates the rate of flow of gas into the cabinet and the amount of gas left in the cylinder.

These can be purchased from the company that supplies the gas, and the company representative can explain how to operate them and how to determine how much gas is needed to reach 5% concentration. This is done by determining the cubic foot space within the cabinet. If the cabinet holds ten cubic feet of air, for instance, only ½ cubic foot of gas is needed to obtain a 5% concentration, not considering the air displaced by the animal's body.

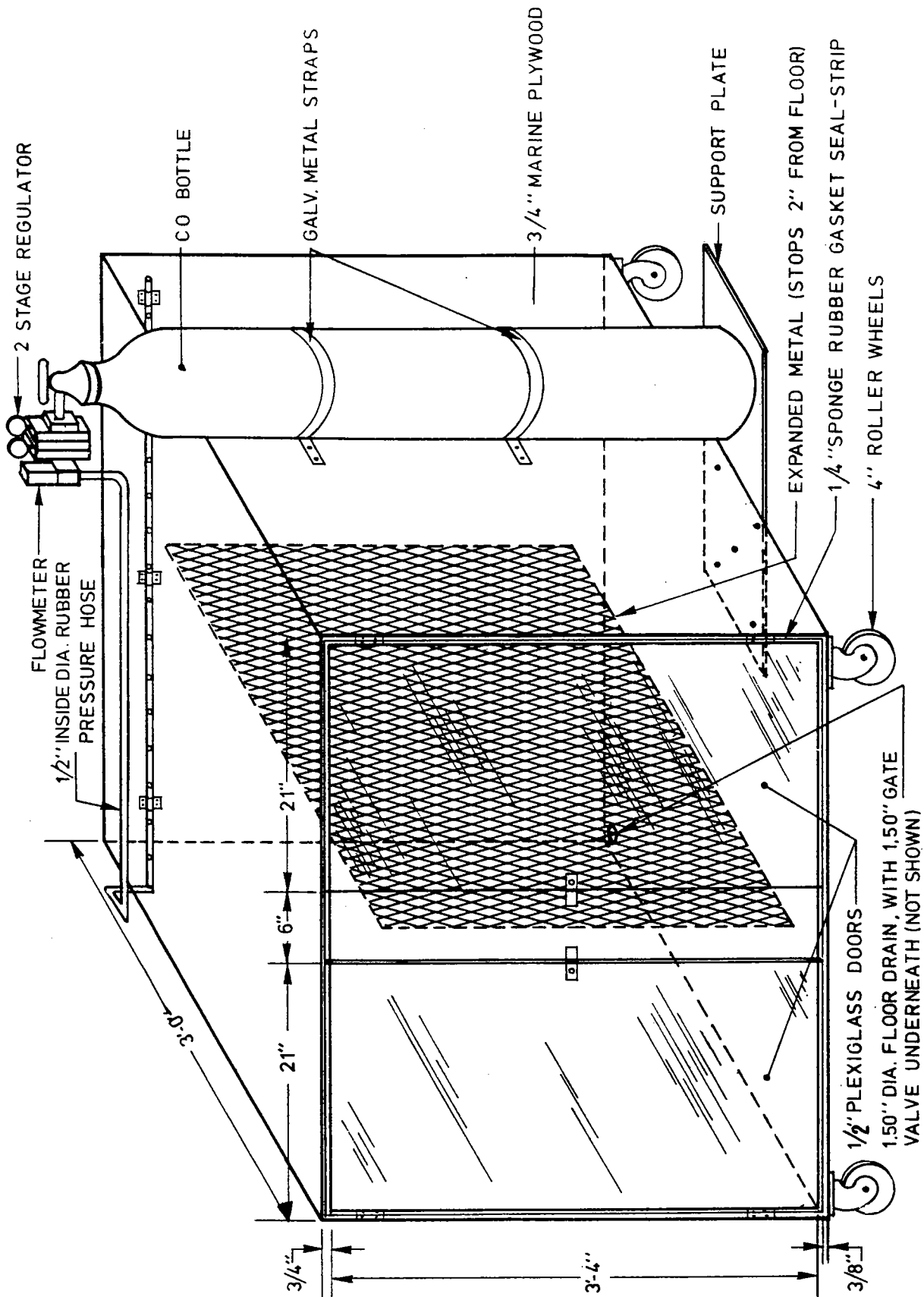
Procedures and Precautions

1) The cabinet should be located outside for the safety of personnel. It should be placed near the kennels but secure from observation by the public, fenced for security reasons, and under a roof for weather protection. If the cabinet is indoors, it should be equipped with an exhaust fan and relief port, both leading to the outside, for emptying the cabinet of carbon monoxide gas before carcasses are removed. There should be a gas analyzer in the room with warning bells both in the room and in the front office. These bells must ring in the event of a gas leak into the room and should be tested frequently. This is for the protection of personnel.

2) After the animal is placed in the lighted cabinet and the carbon monoxide is administered, the animal should be left in the cabinet for a minimum of twenty minutes.

A turn-on switch for the exhaust fan should be mounted far enough away from the cabinet so the cabinet can be fully vented before personnel approach it.

The animals should be removed from the cabinet only after the carbon monoxide has been exhausted. The animals should be checked for heartbeat and then laid out to observe the onset of rigor mortis. Never dispose of an animal immediately after removal from the cabinet.



NOTE: This drawing is a prototype suitable for animals weighing up to 90 pounds. It should be modified for larger animals.

CARBON MONOXIDE EUTHANASIA CABINET

SCALE: 1" = 1'



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GENERAL STATEMENT REGARDING EUTHANASIA METHODS

One of the greatest obligations those in animal welfare and control have is to provide the most humane death possible for unwanted and discarded animals. Results of a recent HSUS survey indicate that of the approximately 13 million domestic animals sheltered each year in this country, nearly 70 percent are euthanized. Thus, the obligation to use a humane method of euthanasia is even greater because of the number of animals euthanized.

There are many factors to be considered when choosing a method of euthanasia. The most important factor, of course, is the humaneness of the method, but there are other considerations, such as the number and type of animals handled, the number of employees available for animal care and euthanasia, and the available training for euthanasia personnel. After these factors are considered, The HSUS also would like those responsible to know the following general information about various forms of euthanasia. Once an acceptable method is chosen, shelter personnel should be very careful to keep an adequate inventory of euthanasia drugs so that the shelter always has acceptable drugs on hand.

Sodium Pentobarbital

The HSUS believes that sodium pentobarbital, injected by well-trained and caring personnel, can provide the most humane death; an injection of sodium pentobarbital is the preferred method of euthanasia. The HSUS recommends that euthanasia personnel be trained to administer this drug before using it for euthanasia. The HSUS also recommends that there be two people involved in the euthanasia process: one to hold and calm the animals, and one to inject. Depending on the animal and the technician's training, sodium pentobarbital may be administered by intravenous, intraperitoneal, or intracardiac injection. *Intrathoracic injections are never acceptable.* Sodium pentobarbital is a Schedule II narcotic which means that it is a controlled drug; it can only be purchased using a DEA* registration and order form and is subject to security and record keeping requirements. (See "Euthanasia of Dogs and Cats with Sodium Pentobarbital" for more information.)

*Drug Enforcement Administration, U.S. Department of Justice

FP-3 is sodium pentobarbital combined with lidocaine, a drug commonly used as a local anesthetic. FP-3 is a new euthanasia drug and has been on the market only since mid-1984. According to the manufacturer, lidocaine expedites the euthanasia process by acting as an additional depressant on the central nervous system and by selectively targeting the heart for quick cardiac arrest. FP-3 is used in the same manner as sodium pentobarbital, with the added benefit of being a Schedule III drug rather than Schedule II as sodium pentobarbital is. FP-3, as a Schedule III drug, can be obtained directly from the drug company by anyone with a DEA registration; no DEA order form is required. Schedule III drugs are subject to the same security and record keeping requirements as Schedule II drugs.

Carbon Monoxide

Carbon monoxide may be an acceptable method, but The HSUS does not feel that it is as suitable as sodium pentobarbital. Carbon monoxide must be properly cooled and filtered, or from a cylinder. The chamber must be designed in such a way as to reduce stress and to allow for species and size separation, as well as for efficiency. Common problems with carbon monoxide are that chambers are very easy to overcrowd; some animals are stressed by the procedure; carbon monoxide should *not* be used to euthanize animals under eight weeks of age; sick, old, or injured animals must be handled very carefully, may be difficult to move, and require special handling and individual cages within a chamber; and since carbon monoxide is odorless, it presents some human health hazards if not handled properly. Because of the special needs of infant, sick, old, or injured animals, there should always be an acceptable backup method of euthanasia. (See "Euthanasia of Dogs and Cats with Carbon Monoxide" for more information.)

Beuthanasia-D Special

Beuthanasia-D is sodium pentobarbital combined with a cardiac toxin. It cannot at this time be regarded the same as unadulterated or pure sodium pentobarbital. Beuthanasia-D *may* afford a humane death; however, due to limited testing, The HSUS cannot recommend its use for routine euthanasia of dogs and cats. According to the manufacturer, Beuthanasia-D has been tested only on dogs, and intravenous injection is the only recommended route. Beuthanasia-D is a Schedule III drug.

T-61

T-61 is an injectable drug combination that The HSUS considers *unacceptable* for animal euthanasia. There are many manufacturer-recommended restrictions on the use of T-61: A *major limitation* on the use of this drug is that it should be injected *only* intravenously and not administered by any other route. An additional limitation is that it should be administered at a precise rate. Not only does the skill of euthanasia technicians vary from person to person, but the reactions of the animals are variable and unpredictable. There are unanswered questions about the order in which the components of this drug take effect: It is possible that under certain circumstances the paralyzing drug component may take effect before the animal loses consciousness.

T-61 is an impractical and unacceptable euthanasia drug. It is not a controlled substance, but it is one of the more expensive euthanasia drugs.

Inhumane Methods

The methods that The HSUS considers *inhumane*, clearly *disapproves* of, and campaigns against are decompression, succinylcholine chloride (Sucostrin, U-Tha-Sol, Anectine, Quelicin Chloride, Scoline Chloride), nitrogen flushing, chloral hydrate, magnesium sulphate, and potassium chloride.

Please contact The HSUS if you would like additional information on any euthanasia methods.