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# The use of Ketamine Hydrochloride in Wild Birds, Mammals and Reptiles

by  
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and  
Michael Lindeen†

The surgical management of certain wild species, as well as domestic felines, has presented numerous problems to veterinarians. Many doctors have shied away from treating simple surgical problems, trauma cases, and medical problems in species of animals that at best are physically difficult to handle. Euthanasia is often offered as an adjunct to our inability to handle these animals. With the advent of Ketamine hydrochloride many of the intractable wildlife animals can now be handled safely by practitioners willing to work with them.

Ketamine hydrochloride is a rapid acting, non-narcotic, non-barbiturate dissociative agent, recommended for use in cats and subhuman primates. Chemically it is designated as d-1-(2-0-chlorophenyl)-2-(methylamino) cyclohexamine chloride. It is supplied as a slightly acid (pH 3.5 to 5.5) solution for intramuscular injection in a concentration containing 100 mg Ketamine base per milliliter of solution.<sup>3</sup>

Ketamine produces profound analgesia, while maintaining normal pharyngeal-laryngeal reflexes. It produces mild cardiac stimulation and respiratory depression. Reflexes such as corneal and pedal are maintained with Ketamine and should not be used to judge the depth of anesthesia.<sup>3</sup> The eyes remain open so an ophthalmic ointment should be applied to the cornea in cases of prolonged anesthesia. Although the swallowing reflex is maintained, salivation should be controlled with atropine sulphate. Post anesthetic temperature depression is a common oc-

currence, so methods of preserving body heat should be employed.

The state of anesthesia is not that normally recognized with other anesthetic agents, but is classified as "dissociative anesthesia" (-the analgesia produced is not accompanied by central nervous system depression and hypnosis, but is what appears to be a state of catalepsy, or suppression of the reticular activating system).<sup>4</sup> Muscle tone may vary from enhanced to normal to diminished, dependent on the dosage employed. Greater doses will tend to diminish muscle tone. If muscle relaxation is necessary or desired for a procedure, a low dose of Ketamine may be administered intramuscularly as an inducing agent, and gas anesthesia used to maintain the animal at the desired plane of anesthesia.<sup>2</sup>

The following animals have been anesthetized with Ketamine at the dose levels indicated, and although we feel these are safe levels, we recommend them only as guidelines.

Forty-two raccoons (*Procyon lotor*) of both sexes, ranging in age from juvenile to adult have been anesthetized and recovered. The level given ranged from 1.5 mg/pound to 12 mg/pound, with 8.5 mg/pound giving the desired results. As no previous work was known to have been done a low level was used initially. Although best results were obtained with 10-12 mg/pound, the recovery period was too extended for these animals (six to eight hours to recovery) as they were in their natural habitat. 8.5 mg/pound gave good restraint for about 15-30 minutes, and the animals recovered in two to six hours. Only two deaths were recorded,

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and these were due to faulty cardiac puncture, confirmed at necropsy, rather than to anesthesia.

Mr. Carter Niemeyer, a wildlife biologist at Iowa State University, anesthetized 301 raccoons using the above dose rate and had no death losses in any of the animals.

Twelve skunks (*Mephitis mephitis*) and four opossums (*Didelphis virginianis*) were safely anesthetized using 8. mg/pound.

Most doses were administered intraperitoneally and anesthesia was achieved in one to three minutes. Initially intramuscular administration was used, but induction of restraint was slow (three to twelve minutes). These animals were injected while restrained in restraining cones made of 1" mesh chicken wire after transfer from live box traps to the cones. Although intraperitoneal administration enhances rapid induction, the technique is not recommended for caged animals as it could possibly result in a puncture to some portion of the abdominal viscera, possibly resulting in a peritonitis.

Three birds (one golden eagle done twice, one pigeon, and one red tail hawk) were induced using intramuscular injections into the pectoral muscles, one half the dose placed in the right pectoral, one half the dose in the left pectoral. The dose used was 20 mg/Kg. All birds recovered from the anesthesia. Prevention of self-inflicted injury to birds (by stumbling or falling) is important during recovery, so they should be kept in a confined darkened area to minimize the trauma.

The following dosages have been published by Beck:<sup>1,2</sup>

Ocelot ( <i>Felis pardalis</i> )	22 mg/pound
Lion ( <i>Felis leo</i> )	5-7.5
Mink ( <i>Mustela vison</i> )	5-20
Ferret ( <i>Mustela putorius</i> )	20-25
Monkeys	10-15
Chimpanzees ( <i>Pan troglodytes</i> )	10-15
Rabbit	6-12
Snakes	20-40
Caimans	50
Birds	5-25

Recovery in a dark quiet cage or room is recommended for the protection of the animals. Complete recovery is recognized by loss of ataxia.

The most severe post anesthetic problems noted are a transient ataxia, slight temperature depression, and injury due to disturbed recovery.

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Carter Niemeyer, M.S., Iowa State Univ. Dept. of Fisheries and Wildlife Biology.

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# Wildlife Recipe of the Month

## Elephant Stew

### Ingredients:

- One elephant (any size)
- Brown gravy
- Salt and Pepper
- Two rabbits (optional)

Cut the elephant into bite sized pieces. This should take about two months. Cover with brown gravy, and cook over a kerosene fire about four weeks at 465°.

This recipe will serve about 3800 people. If more guests are expected two rabbits may be added, but do this only if necessary, as most people do not like to find hare in their stew!

Submitted by John Haupert

Peter Banitt