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animals: nonhuman primates, dog, cat, rabbit, guinea pig, rat,
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ANALGESICS AND EUTHANASIA AGENTS
FOR LABORATORY ANIMALS

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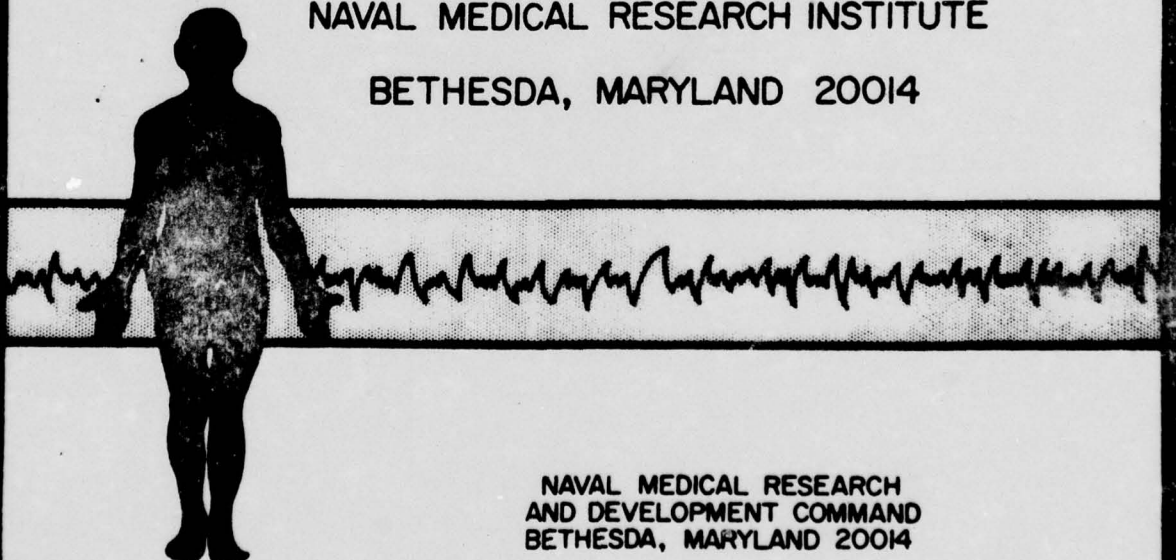
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A Guide to the Type and Amount of Tranquillizers, Anesthetics,
Analgesics and Euthanasia Agents for Laboratory Animals.

Abstract

This guide has been designed for the investigator requiring information regarding the type and amount of tranquillizers, anesthetics, analgesics, and euthanasia agents used in the following laboratory animals: nonhuman primates, dog, cat, rabbit, guinea pig, rat, mouse, hamster, pig, sheep, and avian species.

Key Words.

Laboratory animals; drug dosages; tranquillizers; anesthetics; analgesics; euthanasia.

INTRODUCTION

Public Law 91-579, Animal Welfare Act of 1970, and PL94-279, 1976 amendment to Animal Welfare Act, require that as part of the program of adequate veterinary care, guidelines and consultation be provided to research personnel with respect to the type and amount of tranquilizer, analgesic and anesthetic needed for each of the species used at the research facility. The following guide lists those drugs currently in use at the Naval Medical Research Institute (NMRI) and recommended by the Veterinary Medical Sciences Department (VMSD). These guidelines are not intended to restrict research activities, as their sole intent is to insure the continued humane care and treatment of animals used in research.

This guide is not intended to be a complete source of information regarding the use of tranquilizers, anesthetics and analgesics in laboratory animals. Personnel unfamiliar with the use of these drugs in animals are encouraged to consult with the veterinarians in VMSSD regarding the selection of the best drug(s) for the desired procedure, the specific research need, the contraindications for the various drugs in animals, the techniques and methods of administration of the drugs, the duration of effects, the treatment of overdosage, and other possible effects on the research protocol. Information regarding other animal species and the use of other drugs can also be obtained from VMSSD veterinarians.

The age, weight, and health status of each animal should be carefully evaluated before using particular drug and dose schedules. VMSSD veterinarians are available to assist with these evaluations.

Succinylcholine, curare, or curare-type drugs do not have any analgesic, cataleptoid, or psychosedative properties and should not be used to alleviate pain or discomfort.

Ether, because of explosive potential and the irritating effect on the respiratory tract, is not recommended as an anesthetic or euthanasia agent.

Chloroform is not recommended as an anesthetic or euthanasia agent due to the carcinogenic and toxic effects on humans and animals, even in adjacent rooms.

It is required that laboratory animals be placed on analgesic medication after they have undergone major surgical procedures unless the administration of the analgesics would interfere with the experimental protocol.

A carbon dioxide chamber and inhalant anesthetic machines are available in VMSSD for investigator use.

NONHUMAN PRIMATES

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics*</u>		
Atropine sulfate	0.04mg/kg	IM, IV, SC
Morphine	1-3mg/kg (chimpanzee) 0.5-0.75mg/kg (other primates)	SC SC
Meperidine (Demerol ^R)	10mg/kg (chimpanzee)	IM
Droperidol-Fentanyl (Innovar ^R)	0.05ml/kg	IM
Acetylpromazine maleate (Acepromazine ^R)	0.5-1mg/kg	IM, SC
Chlorpromazine (Thorazine ^R)	1-6mg/kg	IM
Meprobamate (Miltown ^R)	100-400mg/kg	PO
Phencyclidine Hydrochloride (Sernylan ^R)		
<u>Pan sp</u> (chimpanzee)	0.5-0.7mg/kg	IM
<u>Papio sp</u> (baboon)	0.5-0.8mg/kg	IM
<u>Saimiri sp</u> (squirrel monkey)	0.5-0.7mg/kg	IM
<u>Macaca mulatta</u> (Rhesus)	0.5-1.0mg/kg	IM
<u>Macaca nemestrina</u> (pigtail macaque)	0.5-1.5mg/kg	IM
<u>Macaca fascicularis</u> (cynomologous)	0.5-1.5mg/kg	IM

* Preanesthetics include chemical restraint agents, sedatives, tranquilizers, and anticholinergics.

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
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Preanesthetics (cond'd.)

Ketamine Hydrochloride
(Vetalar^R)

Chimpanzee	5.0-7.5mg/kg	IM
Pigtail	5.0-7.5mg/kg	IM
Stumptail (<u>Macaca arctoides</u>)	5.0-7.5mg/kg	IM
Rhesus	5.0-10.0mg/kg	IM
Baboon	10.0-12.0mg/kg	IM
Cynomologous	12.0-15.0mg/kg	IM
Squirrel Monkey	12.0-15.0mg/kg	IM

10ml Ketamine Hydrochloride mixed
with 1ml Acepromazine^R

Use at same dose as
Ketamine only

Anesthetics

Injectable

Phencyclidine
Hydrochloride

Chimpanzee	0.8-1.1mg/kg	IM
Baboon	0.8-1.0mg/kg	IM
Squirrel monkey	0.8-1.5mg/kg	IM
Rhesus	1.0-3.0mg/kg	IM
Pigtail macaque	1.5-3.0mg/kg	IM
Cynomologous	1.6-3.0mg/kg	IM

Ketamine

Chimpanzee	10.0-15.0mg/kg	IM
Pigtail	20.0-25.0mg/kg	IM

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
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Ketamine (cont'd.)

Stumptail	20.0-25.0mg/kg	IM
Rhesus	20.0-25.0mg/kg	IM
Baboon	20.0-25.0mg/kg	IM
Cynomologous	20.0-25.0mg/kg	IM
Squirrel Monkey	25.0-30.0mg/kg	IM

10ml Ketamine mixed with 1ml Acepromazine^R Use same dose as Ketamine only.

Pentobarbital (Nembutal ^R)	20-25mg/kg to effect	IV
2.5% Thiopental (Pentothal ^R)	25mg/kg to effect	IV
2.5% Thiamylal (Surital ^R)	25mg/kg to effect	IV

Inhalants

Halothane (Fluothane ^R)	To effect Induction 1-4% Maintenance 0.5%-2%	Face Mask or endotracheal tube
Halothane & Nitrous oxide (50% oxygen: 50% Nitrous Oxide)	To effect Induction 1-4% Maintenance 0.5-1%	Face Mask or endotracheal tube
Methoxyflurane (Penthrane ^R) (Metofane ^R)	To effect Induction 3-4% Maintenance 0.25-1%	Face Mask or endotracheal tube

Analgesics

Morphine	0.5-0.7mg/kg	SC
Meperidine (Demerol ^R)	3-11mg/kg	IM
Pentazocine (Talwin ^R)	1.5-3mg/kg Not to exceed total dose of 60mg	IM, SC

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Euthanasia</u>		
Somlethol ^R	1ml/10 lb	IV
Pentobarbital	80mg/kg(39mg/lb)	IV

DOG

(Canis familiaris)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	0.04mg/kg	IM, IV, SC
Acetylpromazine	0.5-1mg/kg 1-3mg/kg	IM, SC, IV PO
Chlorpromazine	1-6mg/kg 0.5-8mg/kg	IM PO
Meprobamate	100-400mg/kg	PO
Xylazine (Rompun ^R)	1mg/kg 2mg/kg	IV IM, SC
Meperidine	10-20mg/kg	IM, SC
Morphine	1-1.5mg/kg	IM, SC
Droperidol-Fentanyl Use atropine prior to IV dosage.	1ml/15-20 lbs 1ml/25-60 lbs.	IM IV
<u>Anesthetics</u>		
<u>Injectable</u>		
Pentobarbital	25-30mg/kg to effect	IV
Thiopental	15-25mg/kg to effect	IV
Thiamylal	15-20mg/kg to effect	IV
<u>Inhalants</u>		
Halothane	To effect Induction 1-4% Maintenance 0.5-2%	Endotracheal tube
Halothane and Nitrous oxide (50% oxygen:50% nitrous oxide)	To effect	Endotracheal tube
Methoxyflurane	To effect Induction 3-4% Maintenance 0.25-1%	Endotracheal tube

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Analgesics</u>		
Fentazocine	1.5-3mg/kg	IM
Xylazine	1mg/kg 2mg/kg	IV IM, SC
Meperidine	10-20mg/kg	IM, SC, PO
Morphine	1-1.5mg/kg	SC
Droperidol-Fentanyl	1ml/15-20 lbs	IM
<u>Euthanasia</u>		
Somlethol ^R	1ml/10 lbs	IV
Pentobarbital	80mg/kg	IV

CAT

(Felis catus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	0.04mg/kg	SC, IM, IV
Acetylpromazine	1-2mg/kg 1-3mg/kg	IM, SC, IV PO
Ketamine	11mg/kg	SC
10ml Ketamine mixed with 1ml Acepromazine	Use at same dose as Ketamine only.	
Meperidine	Do not exceed 11mg/kg	SC, IM
Xylazine	1-2mg/kg	IM, SC
Meprobamate	50mg/kg	PO
<u>Anesthetics</u>		
<u>Injectable</u>		
Ketamine (or Ketamine/Acepromazine mixture)	22-33mg/kg	IM
Pentobarbital	30mg/kg to effect	IV
2½% Thiopental	15-25mg/kg to effect	IV
Alpha Chloralose	75-85mg/kg to effect	IV
Alpha Chloralose	70mg/kg	IP
Given with Pentobarbital	12mg/kg	IP

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Inhalants</u>		
Methoxyflurane	To effect Induction 3-4% Maintenance 0.25-1%	Endotracheal Tube
Halothane	To effect Induction 1-4% Maintenance 0.5-2%	Endotracheal Tube
Halothane & Nitrous oxide (50% oxygen: 50% Nitrous oxide)	To effect Induction 1-4% Maintenance 0.5-1%	Endotracheal Tube
<u>Analgesics*</u>		
Meperidine	5-11mg/kg	IM, SC, PO
Xylazine	2mg/kg	IM, SC
*Morphine is contraindicated in the cat.		
<u>Euthanasia</u>		
Somlethol ^R	1ml/10 lbs	IV
Pentobarbital	80mg/kg	IV

RABBIT

(Oryctolagus cuniculus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	0.05-0.5mg/kg	SC, IM
Droperidol-Fentanyl	0.1-0.22ml	IM
Acetylpromazine	1mg/kg	IM, SC
Ketamine	15-50mg/kg	IM
10ml Ketamine mixed with 1ml Acepromazine	Use at same dose as Ketamine only.	
Chlorpromazine	10-25mg/kg	IV, IM
Diazepan (Valium ^R)	5-10mg/kg	IM
Meprobamate	50-150mg/kg	IM
<u>Anesthetics</u>		
<u>Injectable</u>		
Xylazine	8.8mg/kg	IM
follow in 10 minutes with Ketamine	50mg/kg	IM
Ketamine (or Ketamine/Acepromazine mixture)	50mg/kg	IM
follow in 10 minutes with 2½% Thiopental	To effect	IV
Pentobarbital	20-40mg/kg to effect	IV
Use dilute solution (12-15mg/cc) Small margin of safety in rabbit		

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
Dial Urethane	1-1.6gm/kg	IP, IV
Alpha Chloralose	120mg/kg	IV
1% Thiamylal	To effect	IV
<u>Inhalants</u>		
Halothane	To effect	Face Mask
Methoxyfluorane	To effect	Face Mask
<u>Analgesics</u>		
Meperidine	2-10mg/kg	IM, IV
Pentazocine	1.5-3mg/kg	IM
<u>Euthanasia</u>		
Somlethol ^R	1ml/10 lbs	IV
Pentobarbital	80mg/kg	IV
Carbon Dioxide	To effect	Chamber

GUINEA PIG

(Cavia porcellus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
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Preanesthetic

Atropine	0.5mg/kg	SC, IM
Droperidol-fentanyl	0.06-0.08ml/kg	IM
Morphine	2-5mg/kg	IM, SC
Ketamine	22-44mg/kg	IM
10ml Ketamine mixed with 1ml Acetylpromazine	Use at same dose as Ketamine Only	IM
Chlorpromazine	0.5-25mg/kg	IM
Meprobamate	100mg/kg	IM

Anesthetics

Injectable

Pentobarbital	15-30mg/kg	IP
Thiopental	12-16mg/kg to effect 20mg/kg	IV IP
Droperidol-fentanyl	0.66-0.88ml/kg	IM
Ketamine (or Ketamine/Acepromazine mixture)	44mg/kg	IM
Dial Urethane	1500mg/kg	IP

Inhalant

Methoxyfluorane	To effect	Bell Jar or Face Mask
Halothane	To effect	Bell Jar or Face Mask

Analgesics

Meperidine	2-10mg/kg	IM
Pentazocine	2-3mg/kg	IM

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Euthanasia</u>		
SomletholR	0.1 ml/1 lb	IP
Pentobarbital	80mg/kg	IP
Carbon Dioxide	To effect	Chamber
Decapitation	-	-

RAT

(Rattus norvegicus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	15mg/100gm	SC, IP, IM
Chlorpromazine	25mg/kg	SC, IP, IM
Droperidol-Fentanyl	0.13ml/kg	IM
Ketamine (Use dilute solution 10mg/ml)	22-44mg/kg	IM
10ml Ketamine mixed with 1ml Acepromazine	Use at same dose as Ketamine only	IM
Chlordizepoxide (LibriumR)	1-40mg/kg	IP
Diazepam	0.5-15mg/kg	IP
Pentobarbital	Up to 20mg/kg	IP
Meprobamate	150mg/kg	IP, IM
<u>Anesthetics</u>		
<u>Injectable</u>		
Pentobarbital Sodium (Use dilute solution 6mg/ml)	30-50mg/kg	IP
Droperidol-Fentanyl	0.2ml/kg	IM
Ketamine (Use dilute solution 10mg/ml)	44mg/kg	IM
1% Thiamylal	30mg/kg	IP
1% Thiopental	20-40mg/kg	IP

<u>Drug Indication/Drug</u>	<u>Dosage/Body</u>	<u>Method of Administration</u>
Alpha Chloralose	55mg/kg	IP
Dial Urethane	780mg/kg	IP
Pentobarbital used simultane- ously with	40mg/kg	IP
Chloral Hydrate	160mg/kg	IP
<u>Inhalant</u>		
Halothane	To effect	Face mask, Bell jar or Nose cone
Methoxyflurane	To effect	Face mask, Bell jar or Nose cone
<u>Analgesics</u>		
Morphine	5mg/kg	SC
Meperidine	2mg/kg	IM
Pentazocine	2-3mg/kg	IM
<u>Euthanasia</u>		
Somlethol ^R	0.2ml/adult	IP
Pentobarbital	80mg/kg	IP
Carbon Dioxide	To effect	Chamber
Decapitation		

MOUSE

(Mus musculus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	10-25mg/kg	IP
Chlorpromazine	50mg/kg	IM
Ketamine (Use dilute solution 10mg/ml)	22-44mg/kg	IM
10ml Ketamine mixed with 1ml Acetyl-promazine	Use at same dose as Ketamine only.	
10% Solution Droperidol-Fentanyl	0.1-0.2ml/100gm	IM
Meprobamate	100mg/kg	IM
<u>Anesthetics</u>		
<u>Injectable</u>		
Pentobarbital (Use dilute solution 6mg/ml)	0.03-0.07mg/gm	IP
10% solution Droperidol-Fentanyl	0.5ml/100gm	IM
Ketamine (or Ketamine/Acepromazine mixture)(Use dilute solution 10mg Ketamine per ml)	22-44mg/kg	IM
1% Thiopental	25mg/kg	IP
1% Thiamylal	30mg/kg	IP
Alpha Chloralose	114mg/kg	IP

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Inhalant</u>		
Methoxyfluorane	To effect	Bell Jar, Nose Cone
Halothane	To effect	Bell Jar, Nose Cone
<u>Analgesics</u>		
Meperidine	2mg/kg	IP
Pentazocine	2-3mg/kg	IM
<u>Euthanasia</u>		
Somlethol ^R	0.1ml/mouse	IP
Pentobarbital	80mg/kg	IP
Carbon Dioxide	To effect	Chamber
Cervical Dislocation	-	-
Decapitation	-	-

HAMSTER

(Mesocricetus auratus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
10% solution Droperidol-Fentanyl	0.1ml/100gms	IM
Ketamine	22-44mg/kg	IM
10ml: Ketamine mixed with 1ml Acetylpromazine	Use at same dose as Ketamine only	
Chlorpromazine	0.5mg/kg	IM
Meprobamate	100mg/kg	IM
<u>Anesthetics</u>		
<u>Injectable</u>		
Pentobarbital (Use dilute solution 6mg/ml)	30-50mg/kg	IP
1% Thiamylal	30mg/kg	IP
1% Thiopental	40mg/kg	IP
Ketamine (or Ketamine/Acetylpromazine mixture)	44mg/kg	IM
<u>Inhalant</u>		
Methoxyfluorane	To effect	Bell jar, Nose cone, Face mask
Halothane	To effect	Bell jar, Nose cone, Face mask
<u>Analgesics</u>		
Meperidine	2mg/kg	IM
Pentazocine	2-3mg/kg	IM

HAMSTER

(Mesocricetus auratus)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
10% solution Droperi- dol-Fentanyl	0.1ml/100gms	IM
Ketamine	22-44mg/kg	IM
10ml: Ketamine mixed with 1ml Acetyl- promazine	Use at same dose as Ketamine only	
Chlorpromazine	0.5mg/kg	IM
Meprobamate	100mg/kg	IM
<u>Anesthetics</u>		
<u>Injectable</u>		
Pentobarbital (Use dilute solu- tion 6mg/ml)	30-50mg/kg	IP
1% Thiamylal	30mg/kg	IP
1% Thiopental	40mg/kg	IP
Ketamine (or Keta- mine/Acetylproma- zine mixture)	44mg/kg	IM
<u>Inhalant</u>		
Methoxyfluorane	To effect	Bell jar, Nose cone, Face mask
Halothane	To effect	Bell jar, Nose cone, Face mask
<u>Analgesics</u>		
Meperidine	2mg/kg	IM
Pentazocine	2-3mg/kg	IM

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Euthanasia</u>		
Somlethol ^R	0.2ml/hamster	IP
Pentobarbital Sodium	80mg/kg	IP
Carbon Dioxide	To effect	Chamber
Decapitation		

PIG
(Sus scrofa)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	0.04mg/kg	IM
Meperidine	1-2mg/kg	IM
Droperidol-Fentanyl	1ml/14kg	IM
Ketamine	20mg/kg	IM
<u>Anesthetics</u>		
<u>Injectable</u>		
5% Thiopental	10mg/kg to effect	IV
4% Thiamylal	10-20mg/kg to effect	IV
Pentobarbital	10-30mg/kg to effect	IV
<u>Inhalants</u>		
Halothane	To Effect Induction 4% Maintenance 0.5-1.5%	Endotracheal Tube
Halothane, Nitrous oxide (50% oxygen: 50% nitrous oxide)	To effect	Endotracheal Tube
<u>Analgesics</u>		
Meperidine	1-2mg/kg	IM
Droperidol-Fentanyl	1ml/14kg	IM
Phenylbutazone	1000-2000mg 1-2mg/lb	PO IV
<u>Euthanasia</u>		
Somlethol ^R	1ml/10 lb	IV
Pentobarbital	80mg/kg	IV

SHEEP

(Ovis aries)

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Preanesthetics</u>		
Atropine	0.2mg/kg Repeat 0.2mg/kg every 15-30 mins.	IV IV
Acetylpromazine	0.55mg/kg	IV
Ketamine	7mg/kg	IV
<u>Anesthetics</u>		
<u>Injectable</u>		
Pentobarbital	30-40mg/kg	IV
Ketamine	7mg/kg (maintenance with 3mg/ml drip)	IV
5% Thiopental	22mg/kg to effect	IV
Xylazine	0.2mg/lb	IV
<u>Inhalants</u>		
Halothane	To effect Induction 5% Maintenance 0.5-2%	Face Mask
Halothane and Nitrous oxide (50% oxygen:50% Nitrous oxide)	To effect	Endotracheal Tube
<u>Analgesics</u>		
Meperidine	2-5mg/kg	IV
Methampyrone (Dipyrone) (Novin ^R)	0.5-2.0ml	IV, SC, IM
Phenylbutazone	2000mg 1-2mg/lb	PO IV
Xylazine	0.1mg/kg	IV

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
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Euthanasia

Somlethol ^R	1ml/10 lb	IV
Pentobarbital	80mg/kg	IV

AVIAN

<u>Drug Indication/Drug</u>	<u>Dosage/Body Weight</u>	<u>Method of Administration</u>
<u>Anesthetics</u>		
<u>Injectable</u>		
Ketamine:		
Pigeon	60mg/kg	IM
Small Birds (Parakeets, etc.)	33-99mg/kg	IM
Large Birds (Chickens, etc.)	15-20mg/kg	IM
Equithesin ^R (Chloralhydrate, pentobarbital & magnesium sulfate)	2-2.5ml/kg	IM
	1-1.5ml/kg	IV
<u>Inhalants</u>		
Halothane	To effect	Nose cone, Bell jar
Methoxyflurane	To effect	Nose cone, Bell jar
<u>Euthanasia</u>		
Pentobarbital	80mg/kg	IV
Carbon dioxide	To effect	Chamber

REFERENCES

1. Amand, W.B.: Avian anesthesia. In Current Veterinary Therapy V. Kirk, R.W., Ed., W.B. Saunders, Co., Philadelphia, 1974, pp. 574-581.
2. AVMA Council Report, Report of the AVMA panel on euthanasia. J Am Vet Med Assn 160:761-772, 1972.
3. Basic Care of Experimental Animals, 5th ed., Animal Welfare Institute, New York, 1970.
4. Beck, C.C. and Dresner, A.J.: Vetalar (ketamine HCl), a cataleptoid anesthetic agent for primate species. VM/SAC 67:1082-1084, 1972.
5. Beck, C.C., et al: Evaluation of Vetalar (ketamine HCl), a unique feline anesthetic. VM/SAC 66:993-996, 1971.
6. Bivin, W.S. and Timmons, E.H.: Basic Biomethodology. In The Biology of the Laboratory Rabbit. Weisbroth, S.H., et al, Eds. Academic Press, New York, 1974, pp. 73-90.
7. Booth, N.H.: Drugs acting on the central nervous system. In Veterinary Pharmacology and Therapeutics, 3rd ed. Jones, L.M., Ed. Iowa State University Press, Ames, Iowa, 1965, pp. 113-232.
8. Bowen, J.M.: Drugs acting on the central nervous system. In Handbook of Laboratory Animal Science, Vol. III. Melby, E. C., Jr. and Altman, N.H., Eds. CRC Press, Inc., Cleveland, 1976, pp. 65-95
9. Bustad, L.K. and McClellan, R.O., Eds.: Swine in Biomedical Research. Frayn Printing Co., Seattle, 1966.

10. Clifford, D.H. and Soma, L.R.: Anesthesiology. In Feline Medicine and Surgery, 1st ed. American Veterinary Publications, Inc., Santa Barbara, California, 1964, pp. 392-460.
11. Cramlet, S.H. and Jones, E.F.: Anesthesiology. Aero-medical Review 1-76, Selected Topics in Laboratory Animal Medicine, Vol. V. Brooks AFB, 1976.
12. Domer, F.R.: Animal Experiments in Pharmacological Analysis. Charles C. Thomas, Springfield, Illinois, 1971.
13. Freeman, M.J., et al: Premedication, tracheal intubation, and methoxyflurane anesthesia in the rabbit, Lab Anim Sci 22:576-580, 1972.
14. Gandal, C.P.: Surgical techniques and anesthesia. In Disease of Cage and Aviary Birds, Petrack, M.L., Ed. Lea & Febiger, Philadelphia, 1969, pp. 217-231.
15. Goodman, L.S. and Gilman, A., Eds: The Pharmacological Basis of Therapeutics, 4th ed. The MacMillan Co., London and Toronto, 1970.
16. Hoar, R.M.: Biomethodology. In The Biology of the Guinea Pig. Wagner, J.E. and Manning, P.J., Eds. Academic Press, New York, 1976, pp. 13-20.
17. Horney, F.D.: Intravenous anesthesia. In Canine Surgery, Archibald, J., Ed. American Veterinary Publications, Inc. Santa Barbara, California, 1965, pp. 74-78.

18. Hughes, H.C., Jr.: Euthanasia of laboratory animals.
In Handbook of Laboratory Animal Science, Vol. III.
Melby, E.C., Jr. and Altman, N.H., Eds. CRC Press, Inc.,
Cleveland, 1976, pp. 553-559.
19. Hughes, H.C. and Lang, C.M.: A comparison of halothane
and methoxyflurane anesthesia in three species of non-
human primates. Lab Anim Sci 22:664-667, 1972.
20. Jones, L.M.: Veterinary Pharmacology and Therapeutics,
3rd ed. Ames, Iowa, Iowa State University Press, 1965.
21. Karl, A.A., et al: Rabbit anesthesia with the combina-
tion of xylazine and ketamine hydrochloride. 25th Annual
Session abstracts. Publication 74-6, Am Assn of Lab Anml
Sci, 1974.
22. Kent, G.M.: General anesthesia in rabbits using methoxy-
flurane, nitrous oxide and oxygen. Lab Anim Sci 21:256-
257, 1971.
23. Lang, C.M.: Animal Physiologic Surgery. Springer -
Verlag, New York, 1976.
24. Lawson, D.D.: Principles of anesthesia; inhalation anes-
thesia. In Canine Surgery, Archibald, J., Ed. American
Veterinary Publications, Inc., Santa Barbara, California,
1965, pp. 57-73.
25. Lewis, G.E. and Jennings, P.B., Jr.: Effective sedation
of laboratory animals using Innovar-Vet. Lab Anim Sci
22:430-432, 1972.

26. Lumb, W.V. and Jones, E.W.: Veterinary Anesthesia. Lea & Febiger, Philadelphia, 1973.
27. Markowitz, J., Archibald, J. and Downie, H.G.: Experimental Surgery, 4th ed. The Williams and Wilkins Co., Baltimore, 1959.
28. Martin, D.P., et al: Methods of anesthesia in nonhuman primates. Lab Anim Sci 22:837-843, 1972.
29. McCormic, J.J. and Ashworth, M.A.: Acepromazine and methoxyflurane anesthesia of immature New Zealand white rabbits. Lab Anim Sci 21:220-223, 1971.
30. McIntyre, J.W.R.: An introduction to general anesthesia of experimental animals. Lab Anim 5:99-114, 1971.
31. Melby, E.C., Jr. and Baker, H.J.: Phencyclidine for analgesia and anesthesia in simian primates. JAVMA 147: 1068-1072, 1965.
32. Miller, E.V., Ben, M. and Cass, J.S.: Comparative anesthesia in laboratory animals. Fed Proc 28:1369-1586, 1969.
33. Moye, R.J., et al: Clinical use of xylazine in dogs and cats. VM/SAC 68:236-241, 1973.
34. Myers, R.D.: General laboratory procedures. In Methods in Psychobiology, Myers, R.D., Ed. Academic Press, New York, 1971, pp. 27-65.
35. Rice, W.M. and Kangstrom, L.E.: Local and regional anesthesia. In Canine Surgery, Archibald, J., Ed. American Veterinary Publications, Inc., Santa Barbara, California 1965, pp. 79-94.

36. Rubright, W.C. and Thayer, C.B.: The use of Innovar-Vet as a surgical anesthetic for the guinea pig. Lab Anim Care 20:989-991, 1970.
37. Russell, R.J. and Schilling, P.W.: The Rabbit, Aeromedical Review 6-73, Selected Topics in Laboratory Animal Medicine Vol. XXI, Brooks AFB, 1973.
38. Sawyer, D.C., Ed. Experimental animal anesthesiology: USAF School of Aerospace Medicine Symposium, Brooks AFB, Texas 1964.
39. Scott, W.N. and Ray, P.M.: Euthanasia. In The UFAW Handbook on the Care and Management of Laboratory Animals, 4th ed. The Williams and Wilkins Co., Baltimore 1972, pp. 158-1166.
40. Skartvedt, S.M. and Lyon, N.C.: A simple apparatus for inducing and maintaining halothane anesthesia of the rabbit. Lab Anim Sci 22:922-924, 1972.
41. Short, C.E., Ed. Symposium on anesthetic management of the high risk patient. The Veterinary Clinics of North America, Vol. 3, No. 1, January 1973.
42. Short, C.E., et al: Comparative responses of pentazocine and meperidine for control of postoperative pain in dogs. VM/SAC 66:586-590, 1971.
43. Soma, L.R., Ed. Textbook of Veterinary Anesthesia. Williams and Wilkins Co., 1971.
44. Stunkard, J.A., Miller, J.C.: An outline guide to general anesthesia in exotic species. VM/SAC 11:11-1186, 1974.

45. Tavenor, W.D.: Anesthesia. In The UFAW Handbook on the Care and Management of Laboratory Animals, 4th ed., The Williams and Wilkins Co., Baltimore, 1972, pp. 148-157.
46. Thurmon, J.C., et al. Evaluation of ketamine hydrochloride as an anesthetic in sheep. JAVMA 162:293-297, 1973.
47. Thurmon, J.C., et al: Ketamine anesthesia in swine. JAVMA 160:1325-1330, 1972.
48. Vondruska, J.E.: Phencyclidine anesthesia in baboons. JAVMA 147:1073-1074, 1965.
49. Wass, J.A., et al: Ketamine-methoxyfluorane anesthesia for rabbits. Am J Vet Res 35:317-318, 1974.
50. Weisbroth, S.H. and J.H. Fudens: Use of ketamine hydrochloride as an anesthetic in laboratory rabbits, rats, mice and guinea pigs. Lab Anim Sci 22:904-906, 1972.