

Recommended Methods of Euthanasia

Euthanasia Methods	Species	Method	Description
	Mice	CO2 asphyxiation followed by a second method to ensure euthanasia	Inhalation till lack of respiration for 5 minutes followed by cervical dislocation or thoracotomy. 100 % CO2 gas dispensed from a regulated tank. Euthanasia chamber will NOT be pre-charged.
	Mice/Rats	Decapitation (scientific justification required)	A commercial guillotine must be utilized for rodents older than neonates. Personal must be trained before use.
	Mice/Rats	Pentobarbital overdose followed by a second method to ensure euthanasia	Pentobarbital administered at ≥ 100 mg/kg IP or IV with cervical dislocation or thoracotomy after loss of respiration.
	Mice/Rats	Inhalant anesthetic overdose followed by a second method to ensure euthanasia	Isoflurane or Halothane inhalent anesthetic administration till lack of respiration for 5 minutes followed by thoracotomy or cervical dislocation
	Mice/Rats	Inhalant or injectable anesthesia followed by exsanguination / physical method	Inhalant or injectable anesthesia administered to a level of surgical anesthesia. A cardiac puncture with a needle and syringe is utilized for exsanguination. Investigator to detail anesthetic, dose and route of administration.
	Mice/Rats	Decapitation of neonates up to 14 days	Detail method of decapitation, e.g. guillotine, sharp scissors, etc. Special training required
	Mice/Rats	Cervical Dislocation (animal weighing < 200 g; scientific justification required)	Description of method and specific training must be provided by investigator per study's needs.
	Rats	CO2 asphyxiation followed by a second method to ensure euthanasia	Inhalation till lack of respiration for 5 minutes followed by thoracotomy or cervical dislocation for rats <200g. 100 % CO2 gas dispensed from a regulated tank. Euthanasia chamber will NOT be pre-charged.
	Hamsters	Decapitation of neonates - up to 14 days	Detail method of decapitation, e.g. guillotine, sharp scissors and special training must be detailed by PI.
	Hamsters / Guinea Pig	Pentobarbital or Inhalant anesthetic overdose followed by a second method to ensure euthanasia	Pentobarbital administered IV or IP at ≥ 100 mg/kg or Sevoflurane, Isoflurane or Halothane inhalants administered till lack of respiration for 5 minutes. A thoracotomy is performed post.
	Hamsters / Guinea Pig	General anesthesia followed by exsanguination / physical method	Injectable or Inhalant anesthesia administered to a level of surgical anesthesia follow by cardiac puncture and exsanguination. Investigator to detail anesthetic, dose and route of administration.
	Hamsters / Guinea Pig	CO2 asphyxiation followed by a second method to ensure euthanasia	Inhalation till lack of respiration for 5 minutes followed by thoracotomy. 100 % CO2 gas dispensed from a regulated tank. Euthanasia chamber will NOT be pre-charged.

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	Ferrets	CO2 asphyxiation followed by a second method to ensure euthanasia	Inhalation till lack of respiration for 5 minutes followed by thoracotomy. 100 % CO2 gas dispensed from a regulated tank. Euthanasia chamber will NOT be pre-charged.
	Ferrets	Pentobarbital overdose followed by a second method to ensure euthanasia	Pentobarbital IP or IV ≥ 100 mg/kg follow by a thoracotomy 5 minutes after loss of respiration.
	Rabbits	Cervical Dislocation of animal weighing < 1 kg , scientific justification required.	Investigator must provide details as to methodology and specific training per studies needs. PI must demonstrate proficiency to Vet.
	Rabbits	Pentobarbital or Inhalant anesthetic overdose and thoracotomy	Pentobarbital administered IP or IV at ≥ 100 mg/kg or Sevoflurane, Isoflurane or Halothane administered till lack of respiration for 5 minutes. A thoracotomy is performed post.
	Rabbits	Anesthesia followed by exsanguination / physical method	Injectable or Inhalant anesthesia administered to a surgical level, follow by cardiac puncture and exsanguination. Investigator is to detail anesthetic, dose and route of administration.
	Dogs / Pigs	Pentobarbital overdose	Pentobarbital IV at ≥ 100 mg/kg and monitoring till lack of respiration for 5 minutes.
	Dogs / Pigs	Anesthesia followed by exsanguination / physical method	Injectable or Inhalant anesthesia administered to a surgical level, follow with cardiac puncture and exsanguination. Investigator to detail anesthetic, dose, and route of administration.
	Dogs / Pigs	General anesthesia followed by KCL IV	KCL administered at 2 mmol/kg in 30-40 cc total volume IV while under a surgical plane of anesthesia. Investigator to detail anesthetic, dose and route.
	Sheep	Pentobarbital IV	Pentobarbital administered IV ≥ 100 mg/kg IV and monitored till lack of respiration for 5 minutes.
	Sheep	KCL IV while under anesthesia	KCL administered at 2 mmol/kg in 30-40 cc total volume IV while under a surgical level of anesthesia. Investigator to detail anesthetic, dose and route.
	Macaques / Baboons	Pentobarbital overdose	Pentobarbital IP or IV ≥ 100 mg/kg and monitored till lack of respiration for 5 minutes.
	Macaques / Baboons	Exsanguination under deep anesthesia	Administration of inhalant or injectable anesthetic to a surgical level followed by exsanguination. Investigator to detail anesthetic, dose and route of administration.
	Xenopus	MS222 or Inhalent anesthesia and Double Pithing	Place animal in 0.1 % buffered solution MS222 until surgical anesthesia is achieved, follow with cranial and spinal pithing.

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	Xenopus	Pentobarbital overdose	Pentobarbital IP \geq 100 mg/kg, monitor for 10 minutes post lack of respiration to assure euthanasia.
	Xenopus	Decapitation - Scientific justification required	Investigator to provide discription of methodology and special training per needs of study.
	Birds	Pentobarbital IV	Pentobarbital IV \geq 100 mg/kg , monitor for 10 min post lack of respiration to assure euthanasia.
	Birds	CO2 asphxiation and thorocotomy	Inhalation till lack of respiration for 5 minutes followed by a thoracotomy. 100 % CO2 gas dispensed from a regulated tank. Euthanasia chamber is NOT to be pre-charged
	Birds	Inhalent anesthetic and cervical dislocation	Adminster Isoflurane, Sevoflurane or Halothane at 5 % via a vaporizer and induction tank untill lack of respiration for 3 minutes, follow with cervical dislocation
	Fish	MS 222, severing spinal cord	Place animal in 0.1 % buffered solution of MS-222 till anesthesia is achieved, then perform decapitation.
	Fish	CO2 asphixiation	Bubble 100 % CO2 through the water of the fish tank till no breathing is seen for > 10 minutes. Follow with decapitation.

Methods per American Veterinary Medical Association Panel on Euthanasia year 2000