

# AVMA 2020 Euthanasia Guidelines: Common Laboratory Animals

Species	Acceptable	Acceptable with conditions
<b>Rodents (e.g. Mice, Rats, Guinea Pigs)</b>	Injectable barbiturates, IP barbiturates with local anaesthetic, dissociative agent combinations	Inhaled anaesthetics, CO <sub>2</sub> (30 to 70% flow rate of chamber or cage volume/min), CO, tribromoethanol (followed by a secondary method), ethanol (adult mice), cervical dislocation, decapitation, focused beam microwave irradiation
<b>Rabbits</b>	IV barbiturates, IP barbiturates with local anaesthetic	Inhaled anaesthetics, CO <sub>2</sub> (50 to 60% flow rate of chamber or cage volume/min), cervical dislocation, PCB, NPCB
<b>Sheep</b>	IV barbiturates	Gunshot, PCB (followed by exsanguination)
<b>Pigs</b>	IV barbiturates	CO <sub>2</sub> , CO, NO, N <sub>2</sub> , Ar, gunshot, electrocution, PCB, NPCB (piglets), manually applied blunt force trauma
<b>Zebrafish</b>	Adults - Rapid chilling (10 minutes), 30 minute immersion in buffered MS 222  4 to 14 day old fry – Rapid chilling (30 minutes)  < 3 day old embryos – immersion in diluted sodium or calcium hypochlorite solution	Immersion in CO <sub>2</sub> saturated water, maceration, decapitation, blunt force trauma followed by pithing or exsanguination
<b>Mammalian Neonates</b>	IP barbiturates	Hypoxia (if in utero and early term pregnancy), IO barbiturates (under anaesthesia)

# AVMA 2020 Euthanasia Guidelines:

## Wildlife

Species	Acceptable	Acceptable with conditions
<b>Rodents (e.g. Mice, Rats, Guinea Pigs)</b>	Injectable barbiturates, IP barbiturates with local anaesthetic, dissociative agent combinations	Inhaled anaesthetics, CO <sub>2</sub> (30 to 70% flow rate of chamber or cage volume/min), CO, tribromoethanol, ethanol (adult mice), cervical dislocation, decapitation, focused beam microwave irradiation
<b>Rabbits</b>	IV barbiturates, IP barbiturates with local anaesthetic	Inhaled anaesthetics, CO <sub>2</sub> (50 to 60% flow rate of chamber or cage volume/min), cervical dislocation, PCB, NPCB
<b>Sheep and Goats</b>	IV barbiturates	Gunshot, PCB (followed by exsanguination), NPCB (goat kids only – followed by exsanguination), CO <sub>2</sub> (goat kids only)
<b>Horses and Cattle</b>	IV barbiturates	PCB, gunshot
<b>Pigs</b>	IV barbiturates	CO <sub>2</sub> , CO, NO, N <sub>2</sub> , Ar, gunshot, electrocution, PCB, NPCB (piglets), manually applied blunt force trauma
<b>Cats and Dogs</b>	IV barbiturates, injectable anaesthetic overdose	Barbiturates (alternate routes of administration), inhaled anaesthetics, CO <sup>*</sup> , CO <sub>2</sub> <sup>*</sup> , gunshot <sup>*</sup> , PCB (dogs) <sup>*</sup>
<b>Avian</b>	IV barbiturates	Inhaled anaesthetics, CO <sub>2</sub> , CO, N <sub>2</sub> , Ar, cervical dislocation (small birds and poultry), decapitation (small birds), gunshot (free-ranging birds)
<b>Reptiles</b>	Injectable barbiturates/MS 222, injectable anaesthetic agents with an adjunctive method	Inhaled anaesthetics (some species), CO <sub>2</sub> (some species), PCB or firearm, manually applied blunt force trauma, rapid freezing for animals < 4 g, spinal cord severance/destruction of brain (crocodilians)

<b>Fish</b>	Immersion in buffered benzocaine or benzocaine hydrochloride, isoflurane, sevoflurane, quinaldine sulfate, buffered MS 222, 2-phenoxyethanol or ethanol, injectable pentobarbital, rapid chilling (small tropical or sub-tropical fish)	Eugenol, isoeugenol, clove oil, CO <sub>2</sub> -saturated water, decapitation/cervical transection/manually applied blunt force trauma followed by pithing or exsanguination, maceration (research setting), PCB (large fish), NPCB (large fish)
<b>Other Free Ranging Wildlife</b>	Injectable barbiturates, injectable anaesthetic overdose	Inhaled anaesthetics, CO*, CO <sub>2</sub> *, gunshot*
<b>Mammalian Neonates</b>	IP barbiturates	Hypoxia (if in utero and early term pregnancy), IO barbiturates (under anaesthesia)

**\*Not recommended for routine use**

IV – intravenous, IP- intraperitoneal, IO – interosseus, PCB – penetrating captive bolt, NPCB - non-penetrating captive bolt

**References:**

- American Veterinary Medical Association 2020, *AVMA Guidelines for the Euthanasia of Animals: 2020 Edition*, AVMA, Illinois