



University of Michigan Policy On Rodent Euthanasia Via Carbon Dioxide Overdose

Carbon dioxide (CO₂) is a frequently used euthanasia agent for small laboratory animals due to its rapid onset of action, safety, and ready availability. However, if not administered properly, CO₂ inhalation has the potential to cause pain and distress on respiratory and ocular membranes. The following are specific requirements for the use of CO₂ in rodent euthanasia.

1. All personnel administering CO₂ to rodents must be properly trained in accordance with the [U-M Policy for Education and Training of Animal Care and Use Personnel](#). Training on the use of the equipment and appropriate methods of euthanasia is available from ULAM Training Core.
2. Compressed gas is the only acceptable source of CO₂ for euthanizing rodents. Other sources such as dry ice must not be used.
3. All CO₂ stations must have a regulator and flow meter installed in order to control the flow rate. The flow rate must be set to 10-30% volume displacement per minute.
4. Euthanasia chambers must be constructed of clear material (e.g. Plexiglas® or polycarbonate) and must be kept clean to minimize odors that might distress animals subsequently euthanized.
5. Individual signage must be posted at the site of the euthanasia station with step-by-step instructions as to how to operate the equipment and ensure death of animals using a secondary method of euthanasia (contact ULAM for signage template).
6. In order to minimize stress during euthanasia, cages must not be overcrowded and animals must be euthanized immediately. Stress may also be reduced by euthanizing rodents in their home cage.
7. The chamber must not be pre-filled with CO₂ prior to placement of animals into the chamber, and must be “purged” (dumped) between euthanasia sessions.
8. A secondary method of euthanasia must be used to ensure death. These methods include exsanguination, decapitation, and bilateral pneumothorax.
9. DO NOT USE CO₂ for euthanasia of any rodent younger than 10 days of age as neonatal rodents are resistant to hypoxia.
10. Embryos and fetuses: CO₂ for euthanasia of a pregnant mother is an acceptable method to cause death of the embryos and fetuses, when fetuses are not required for study.
11. Deviations from this policy require scientific justification and approval by the IACUC.
12. Failure to confirm death of a euthanized rodent is considered significant non-compliance and can be reportable to oversight authorities.



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References

- American Veterinary Medical Association Guidelines for Euthanasia 2013 ([AVMA](#))
- Guide for the Care and Use of Laboratory Animals 2011 ([Guide](#))
- Office of Laboratory Animal Welfare IACUC Guidebook ([OLAW](#))
- Public Health Service Policy: Clarification Regarding Use of Carbon Dioxide for Euthanasia of Small Laboratory Animals ([PHS](#))
- Pritchett, K., D. Corrow, J. Stockwell, and A. Smith. 2005. Euthanasia of Neonatal Mice with Carbon Dioxide. *Comparative Medicine* 55(3): 275-281.
- Pritchett-Corning, K. 2009. Euthanasia of Neonatal Rats with Carbon Dioxide. *JAALAS* 48(1): 23-27. Animal Welfare Act (USDA 9 CFR part 1, § 1.1)