

Safe Use of Isoflurane in Animal Research

Isoflurane is administered to animals predominantly by one of two methods.

Method One: Vaporizer System

The first method involves the use of a vaporizer system, in which the liquid isoflurane is converted to a gas and mixed with oxygen to achieve the desired percent composition that is to be delivered to the animal. Waste anesthetic gas (WAG) scavenging can be managed either actively through the use of a vacuum exhaust, or passively through the use of activated charcoal canisters.

Use of the vaporizer system is effective at delivering a precise amount of isoflurane and, when coupled with active or passive scavenging, minimizing WAG exposure. **Additional steps to reduce your exposure when using a vaporizer system include:**

- Use of an induction box with a sliding lid instead of a hinged lid to reduce WAG release.
- Flush the induction box with oxygen for approximately 10 seconds before opening the box and retrieving the animal.
- Ensure a tight seal around the animal's face when using a nose/face cone to deliver isoflurane. If you do not have a nose/face cone that is equipped with a diaphragm, one may be fashioned from a latex glove.

Method Two: Open-Drop Jar

The second method uses a small container, such as a 500 or 1000 mL jar, and absorbent material, such as a piece of cotton gauze. The liquid anesthetic is placed on the absorbent material, which is then placed into the jar. The animal is transferred into the container and the lid is sealed while the liquid vaporizes. This method is referred to as open-drop jar. There is a high risk of WAG exposure using this method, therefore you should always perform this work in a chemical fume hood or under local exhaust ventilation such as a snorkel hood.

If it is not feasible to use one of these controls, contact the Environment, Health & Safety (EHS) Office to conduct a risk assessment. **Additional steps you can take to reduce your exposure when doing open drop jar include:**

- Use only for brief procedures lasting no longer than 1 minute.
- Keep the jar at arms-length when opening it.
- Use the smallest amount of isoflurane needed to achieve the intended results.
- Do not perform this work in a standard biosafety cabinet or laminar flow hood as they are NOT intended for use with volatile chemicals.

Please take a moment to review the Laboratory Standard Operating Procedure entitled [SOP for Anesthetic Gases in Animal Research](#) published on the EHS website. This document can be customized to fit your lab's specific needs.

If you have any additional questions or concerns, please contact EHS at ehs-animalsafety@umich.edu.