

WVU IACUC POLICY and GUIDELINES: Certification, Maintenance and Use of Equipment Used for Inhalation Anesthesia in Animals

Purpose

Anesthesia machines used for the delivery of inhalation anesthetic *must* be properly functioning to be safe and effective. The purpose of this document is to provide IACUC expectations for use and guidelines regarding recommended maintenance and care of the equipment. In cases where manufacturers' guidelines differ from the recommendations made in this document, please follow the manufacturers' guidelines.

One commonly used machine that does NOT require annual calibration is the SomnoSuite (Kent Scientific) No servicing or calibration is needed, because electronic vaporizers utilizing active vaporization technology do not require annual maintenance and include a no-calibration certificate for facility inspections.

Policy and Guidelines

A. General Considerations

1. Do not use an anesthesia machine that is not working properly. For assistance in troubleshooting, please contact Office of Laboratory Animal Resources (OLAR) veterinary staff.
2. Signs that a machine is not working properly include:
 - a) Discoloration (yellowish brown) in the "Fill" sight glass of the vaporizer
 - b) Sticking valves or knobs
 - c) Animals not responding as anticipated to the level of anesthesia provided
 - d) Unusual odor
3. Any anesthesia equipment that is not in use *should* be marked as "not in use".
4. If the equipment has not been certified or used for a year or more, it *must* be certified prior to use.

B. Equipment certification

1. OLAR will arrange to have an outside company come to WVU to certify machines. Information on scheduling and payment can be found on the OLAR website (<https://hsc.wvu.edu/olar/>) under the "Services & Rates" tab.
2. Equipment *must* be certified annually or if the machine has not been in use for over 1 year.
3. If you choose to not certify your equipment through the OLAR program, it is your responsibility to have this done annually.
4. Documentation of certification is *required*. Ideally, a sticker with the date of certification *should* be placed on the machine.
5. Using anesthetic equipment that does not have a current certification is a non-compliance issue.

C. Waste Anesthetic Gas and Scavenging Systems

Methods of waste anesthetic gas scavenging can be divided into passive and active forms. At least one form of waste anesthetic gas scavenging is *required*. Use of multiple forms of scavenging, including active scavenging, is recommended. For questions about waste anesthetic gas scavenging, please contact OLAR Veterinary Staff or Environmental Health and Safety (EHS).

1. Passive Scavenging
 - a) Follow manufacturers' instructions to determine when canisters should be replaced and the ideal method for determining saturation (time vs. weight).
 - b) Canisters that use weight as a measurement of saturation should be weighed before and after each use. Weight should be recorded on the canister.
 - c) Canisters that use time as a measurement of saturation should have the start and end time recorded on the canister.

- d) Canisters should be properly positioned so that the exhaust vents are **not** blocked (see below).
 - For VaporGuard canisters, the vents are located on the top of the canister. These canisters should be placed in an upright position.
 - For F/air canisters, the vents are located on the bottom. These canisters should be placed in an upright position in a specialized holder that keeps the canister elevated, so that air flow and ventilation is not compromised. Specialized holders are commercially available, or one can be made.
 - ReRefresh canisters last twice as long as standard canisters and have ‘feet’ built onto the bottom to keep canister elevated and not block ventilation through the vents.
- e) Once a canister can no longer be used, it should be labeled as “For Disposal” and set apart from new canisters.
- f) To dispose of a saturated canister, contact WVU Environmental Health & Safety by visiting their website at: <https://www.ehs.wvu.edu/>.

2. Active Scavenging

- a) Examples include fume hood, ducted biosafety cabinet, house exhaust, and snorkels.
- b) If using these methods, ensure they are in proper working order before administering anesthesia. Fume hoods and biosafety cabinets *must* have current certification.

3. Flushing Induction Chambers

- a) Anesthesia induction using gas anesthetics often involves placing an animal into a sealed induction chamber. This is often performed on the benchtop and may lead to exposure to waste anesthetic gas when the induction chambers are opened.
- b) To mitigate potential exposure, it is recommended that the chamber is flushed for 10-15 seconds with oxygen before opening.
- c) When implementing flushing procedures, the activated charcoal filters may have a shorter use life. It is very important that the canisters are weighed after each use and discarded after manufacturer recommended weight increase.
- d) A flush does not need to be performed if the induction chamber is placed into a functional chemical fume hood or ducted biosafety cabinet.

D. Special Considerations for Rebreathing Circuits

- 1. Rebreathing circuits are generally used for animals weighing more than 5-7 kg
- 2. Soda lime should be changed after 8-10 hours of use. Time in use should be recorded and kept on or near the anesthesia machine. When soda lime is changed, all one-way covers on inhalation and exhalation valves should be unscrewed, and the Teflon discs removed and cleaned as needed. Be sure to check the underside. The opening where the disc sits should be checked for rust, dirt, or corrosion, and any moisture should be removed with a soft cloth. If the disc contains any imperfection, it should be replaced. When replacing disc and cover, center the disc in place and screw down cover carefully so as not to damage the disc.

References

[Guide for the Care and Use of Laboratory Animals](#), National Research Council, 2011.

Cynthia Burns & McConnell, LVT, VTS (A&A), vetamac.com, 2019.