SAFE USE OF ANESTHETIC GASES

PERFORMANCE STANDARD: Active delivery of general inhalational agents for animals housed at Duke University will be provided with properly functioning anesthetic equipment to assure their health and well-being during the anesthetic event.

REGULATORY BACKGROUND:
- 8th Edition of The Guide for the Care & Use of Laboratory Animals

ROLES: Personnel must be trained in the proper use of anesthetic machines and vaporizers prior to operation to assure safe handling of the animals and the anesthetic agent. Scavenging of waste anesthetic gases as described in this policy or an OESO approved plan for the protection of the humans working in the area must be employed.

POLICY:
1. Anesthesia machines and vaporizers:
   a. Anesthesia machines must be maintained in good working condition to assure optimal agent delivery in a safe manner.
   b. Vaporizer re-calibration / certification requirements: Annually or in accordance to the manufacturer recommendation. Manufacturer service manual, instructions or certification requirements should be available upon request.
   c. The unit should be serviced by authorized service personnel.

2. Documentation of Equipment Validation/Service:
   a. Vaporizers must have documentation of validation & service. The service date must be affixed to each anesthesia machine or vaporizer that is in service.
   b. Information that must be maintained includes:
      i. Date of last service and/or date of the validation test
      ii. Initials or full name of the person who performed the test
      iii. Test results
   c. Servicing information may be obtained through DLAR.

3. Servicing Other Anesthetic Components: Other components of the anesthesia circuit including CO₂ absorbers (e.g. Soda lime/Baralyme or other devices) should be serviced / replaced as per manufacturer’s guidelines.
4. **Waste Gas Scavenging Systems:**
   a. **Dedicated local exhaust:** A dedicated local exhaust such as an “elephant trunk” or exhaust snorkel can be positioned 4 – 6” from the location of anesthesia delivery to capture gases that leak from an induction chamber or nose cone. Tubing from the exhaust end of the circuit should be directed into the snorkel.
   b. **Use of medical or building vacuum:** Medical vacuum systems are designed to handle waste anesthetic gases and may be connected to the outlet of the anesthesia circuit. Building vacuums are designed to pull air only. However, users may request OESO approval to use building vacuum systems for evacuating waste anesthetic gases.
   c. **Use of charcoal canisters:** Charcoal canisters (e.g., F-Air), may be used to absorb halogenated waste gases. These canisters ARE NOT effective for capture of nitrous oxide. These canisters have a finite life that is based on hours used and/or increase of canister weight. Labs MUST track canister life following the manufacturer’s instructions. The exhaust ports on the charcoal canisters must not be blocked.
   d. **Ductless hood/enclosure:** A ductless hood or enclosure specifically designed to filter halogenated anesthetics may be used in accordance with manufacturer's directions. OESO approval of these devices is required.
   e. **Fume Hoods:** A chemical fume hood may be used to capture waste anesthetic gases. The anesthesia machine, induction chamber, bell jar, etc. should be placed inside the hood. For anesthesia machines, an alternative is to direct the exhaust gas tubing into the hood— in this case, the anesthesia machine should be located as close as possible to the hood so as to minimize the length of tubing required.
   f. **Other:** Other anesthetic gas scavenging methods may be used with prior approval by OESO-Occupational Hygiene and Safety.

5. **Locating the anesthesia event in a room with general ventilation:**
   Anesthesia should always be performed in a room with general ventilation and never in a room without general ventilation (e.g. a closet). When anesthesia is delivered on the benchtop, the room must have general ventilation AND the waste gas must be scavenged using charcoal canisters, local exhaust, medical vacuum, or building vacuum as described above.

**REFERENCES:**
- OESO Safety Information Sheet: [Working Safely with Anesthetic Gases in the Laboratory](#)
- OESO Laboratory Safety Manual; Sec.5: Use of Laboratory Animals; Chap.3: Working with Hazardous Materials: [Safe Use of Anesthetic Gases](#)