Waste Anesthetic Gases (WAG)

Waste anesthetic gases (WAGs) are volatile anesthetic gases (e.g., isoflurane, nitrous oxide, desflurane, and sevoflurane) used during a medical or surgical procedure to alleviate pain and/or distress. This document outlines the occupational hazards associated with exposure to WAGs, which may result in adverse health effects.

**MINIMIZING EXPOSURE**

Work in a well-ventilated area and ensure air is 100% exhausted and not recirculated to other areas. If you have questions or concerns about the space you are working in, please contact an EH&S Industrial Hygienist at 352-392-1591

**SCAVENGING METHODS**

1. **BEST:** Fume hood/ Class II B2 biosafety cabinet (BSC): Work in a chemical fume hood or certified hard-ducted biosafety cabinet for best WAG capture performance.

2. **GOOD:** Active scavenging devices (ductless): Use a manufacturer recommended air cleaning extraction system with an activated charcoal adsorption unit to actively scavenge WAG. **Do NOT use the house vacuum line for active scavenging unless approved by EH&S.**

3. **SUFFICIENT:** Charcoal canisters: Relies on positive pressure from the anesthesia machine and the anesthetized animal’s exhalation to push WAGs into gas adsorption units (i.e., canisters). Any leaks in passive scavenging systems, such as from an inadequate seal on the induction chamber cover or particularly with tubing and nose cones, can cause WAG to leak into the work area.

   **NOTE:** Charcoal adsorption units **CANNOT** be used with nitrous oxide.

If you can **SMELL** Isoflurane, you are being exposed!

**WARNING:**
There are no safe exposure limits for staff who are pregnant or suspect they are pregnant.

**Phone:** 352-392-1591  
**http://www.ehs.ufl.edu/programs/animal-research/**
Checklist for Working with Anesthetic Gas

☐ Ensure personnel receive training on equipment use. This should be documented through the creation of a lab-specific chemicals in Animals Standard Operating Procedure (SOP). The SOP and training will need to be documented in LATCH.

☐ Review and understand the manufacturer’s instructions for operating the equipment.

☐ Use a local exhaust ventilation system (chemical fume hood, downdraft table/sink, etc.) as the preferred means to remove WAGs. Among BSCs, only hard-ducted Class II B2 units effectively remove WAGs from the room.

☐ Verify equipment (e.g., fume hood and vaporizer) is currently certified and in good working condition.

☐ Verify preventative maintenance is performed annually, or as indicated in Anesthetic Equipment Maintenance.

☐ Fill the vaporizer with the specific anesthetic, for which it is certified, in a fume hood or using an anti-spill bottle adaptor. Use chemically compatible gloves, lab coat, and eye protection.

☐ Keep laboratory doors closed when anesthetic gas is in use. Place signage at the entrance to notify lab staff that WAGs are “in use”.

☐ Avoid high concentrations of isoflurane (>4%) for induction and/or for prolonged periods. Turnoff vaporizer when animals are not receiving anesthetic.

☐ Close induction chamber lid(s) during anesthetic gas delivery. To open the chamber door, stand back as far as feasible and open away from worker. Sliding-top chambers are best.

☐ Minimize leakage from animal’s nose cone by selecting the best-fitting cone size with a tight-fitting diaphragm.

☐ Keep worker’s breathing zone as far as possible from animal’s facemask.

Spills

➢ **Do not** attempt to clean up isoflurane spills. Evacuate personnel and allow anesthetic to evaporate. Call EH&S (352-392-1591) for support with large spills (1–2 stock bottles).

Waste

➢ Dispose of charcoal canisters in the regular trash.

➢ Empty bottles may be triple-rinsed (in a fume hood), defaced, and disposed of as non-hazardous glass waste.

Air Monitoring

➢ If you suspect that there is a risk for exposure, contact the EH&S Industrial Hygiene Office to discuss their sampling services at 352-392-1591.

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If there are limited options for scavenging, personal respiratory protection may be necessary to protect the researcher/employee.

Please see the **Respiratory Protection Policy** and Contact the EH&S Industrial Hygienist Office for follow-up questions at 352-392-1591.

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**CHARCOAL CANISTERS**

Gas scavenging canisters must be positioned to ensure the exhaust ports (bottom of the canister) are not blocked in any way.

At installation, and after each use, the canister must be weighed to evaluate the remaining absorption capacity.

The weight will be recorded and dated on the side of the canister.

Canisters that exceed 30 grams (F/Air) or 100 grams (Enviro-Pure) of total accumulated weight must be removed and placed in a sealed plastic prior to disposal in regular trash.

The induction chamber should be thoroughly cleaned immediately after each use to avoid residual waste anesthetic gas being released into the facility.
References


