

Information for Researchers Using Anesthetic Gases

Introduction and Health Effects

Common anesthetic gases that are used include nitrous oxide and halogenated agents such as halothane (Fluothane®), enflurane (Ethrane®), isoflurane (Forane®), desflurane (Suprane®), and sevoflurane (Ultane®). Studies have found that elevated exposures to anesthetics and waste anesthetic gases may result in neurological effects, reproductive effects, and effects on offspring. The specific health effects of the anesthetics vary and you can refer to the material safety data sheet (MSDS) for the health hazard information of the anesthetic that you are working with.

Controlling Exposure

Workplace controls should be in place to ensure exposure to anesthetic gases is as low as reasonably achievable. Occupational exposure to anesthetic gases can be controlled by the use of anesthetic gas scavenging systems which filter the exhaust air before it is released into the room, chemical fume hoods, good work practices, and proper maintenance of equipment to prevent leaks. Leaks into the room air can occur from a variety of locations including the following:

- Point of application to patient or animal (i.e. face shield)
- Anesthetic tank valves
- Connections
- Defective or damaged hoses and tubing
- Inoperative or ineffective scavenging system
- Valves

In addition, certain anesthesia techniques and improper practices such as leaving gas flow control valves open and vaporizers on after use or spills of liquid anesthetics can contribute to the escape of waste anesthetic gases into the atmosphere.

The anesthetic machine should be inspected before each use and whenever the system is moved or relocated during use. Inspect the machine to ensure all parts of the machine are in good working order, the waste gas disposal system is connected, the hoses are free of obstructions and kinks, and leaks are identified and corrected before the system is used.

Personnel who use anesthetic gases should be trained on hazards and exposure symptoms associated with handling and use of the anesthetic gas they are working with. A laboratory standard operating procedure (SOP) should be in place and anesthetics must be included in your laboratory Chemical Hygiene Plan. Anesthetic gas levels in air can be measured to evaluate if your workplace controls are effective. To arrange this, contact the EH&S Occupational Health and Safety Office at 206-543-7388. You can also contact the EH&S Occupational Health and Safety Office to assist with exposure controls if you are using anesthetic gases in clinical settings.

Reference

Occupational Safety and Health Administration (OSHA) Anesthetic Gases: Guidelines for Workplace Exposures. May 18, 2000:
<http://www.osha.gov/dts/osta/anestheticgases/index.html>