OHSU POLICY FOR GENERAL INHALATIONAL ANESTHESIA MACHINE / VAPORIZER /WASTE GAS MAINTENANCE AND CALIBRATION

BACKGROUND: Active delivery of general inhalational agents for animals housed at Oregon Health & Science University will be provided with properly functioning anesthetic equipment which will assure their health and well being during the anesthetic event.

The Guide for the Care and Use of Laboratory Animals (Guide) details basic care requirements for animal use. This document provides guidance regarding anesthesia machine/vaporizer calibration and maintenance. Manufacturer recommendations often range from one to three years depending on the model.

RESPONSIBILITY: It is the responsibility of the Principal Investigator (PI) to contact an authorized service vendor, pay for the certification and to maintain records for all anesthesia equipment owned. Records are to include, a) date of last service, b) initials of service technician, c) date of calibration.

The PI is also responsible to assure that personnel are trained in the proper use of anesthetic machines and vaporizers prior to operation, to assure safe handling of the animals and the anesthetic agent.

PERSONNEL PROTECTIVE EQUIPMENT REQUIREMENTS: Personnel Protective Equipment (PPE) routinely required for normal activity in the animal room or operating space is required when individuals are providing anesthesia. Scavenging of waste anesthetic gases (or a plan for the protection of the humans working in the area) must also be employed.

POLICY: Each piece of equipment involved in the delivery of inhalant anesthetics, and removal of waste gases must be evaluated regularly to assure its proper function and integrity. Tubing, hoses and rubber items are common areas of concern.

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. The primary standard for re-calibration / certification is the manufacturer recommendation, if such recommendation exists, otherwise, this policy applies. If the manufacturer recommendation is the standard chosen, then a copy of the manufacturer service manual or instructions or certification requirements should be available within the laboratory to assist in adequate IACUC oversight of anesthetic equipment.
c. If no manufacturer recommendation is available, then the anesthetic agent delivery must be validated annually or any time the vaporizer has not been in service for more than a year. If the verified delivery is +/- 10% out of calibration, the unit should be serviced by an authorized service center.

d. All anesthetic vaporizers should be serviced by qualified personnel (authorized service center) as recommended by the manufacturer (or annually if no manufacturer recommendation exits).

e. Discoloration (yellowish-brown) in the “Fill” sight glass of a vaporizer may be an indicator for the need for service by an authorized service center. Other indicators might include cracked or damaged hoses, sticking valves or knobs, animals not responding (as anticipated) to the level of anesthesia provided.

f. An active anesthetic monitor (e.g. DATEX OMEDA) may be used as a ‘continuous monitor’ of the integrity of the anesthesia system. Such devices may assist in assuring a safe anesthesia

level for animals, but may not be useful in assuring a safe and healthy working environment for research staff.

2. Waste Gas Scavenging Systems: Scavenging equipment must be maintained in good working order to ensure a safe working environment. An effective mechanism of waste gas scavenging is required for inhalant anesthesia for animal work at OHSU. Waste anesthetic gases may adversely affect liver, kidney and the central nervous system of chronically exposed personnel. Care should be taken to ensure the scavenging system does not compromise anesthetic delivery to the animal or contamination of the procedure area (aseptic
conditions must be maintained for survival surgery of any species).

a. Dedicated Exhaust: A dedicated exhaust or zone capture exhaust is preferred for removal of waste gases from the surgical theater or procedure space. These could include an active 'vacuum' waste gas line or an 'elephant' trunk exhaust.

b. Fume Hoods: The use of a fume hood to capture the waste gas is acceptable. If an anesthesia machine is being used, then placement of the exhaust gas line inside of the fume hood is appropriate.

c. F-Air canisters: Charcoal canisters may be used to absorb halogenated waste gases. These canisters ARE NOT effective for capture of nitrous oxide (often added to an anesthesia). A log indicating the NUMBER OF HOURS used must be maintained on the side of the canister. The total hours the F-Air canister is in use MAY NOT exceed 12 hours. An alternate methodology of monitoring canister life involves weighing the canister after each use and discarding the canister when there is a 50 gm increase in the initial weight. F-Air canisters must be used vertically (do not lay them on their side while in use) and suspended off of the table top or floor (the exhaust ports are in the bottom of the canister).

3. Documentation of Equipment Validation/Service:

a. Vaporizers must have documentation of validation & service. Information that must be maintained includes:

i. Date of last service
I i. Date of the validation test
iii. Initials for the person who performed the test
iv. Test results
v. Vaporizers should have a certificate of the calibration date affixed service.

b. Documentation of service must be affixed to each anesthesia machine or vaporizer that is in service.

c. Servicing information may be obtained through the Department of Comparative Medicine.

4. Other components of the anesthesia circuit (e.g. Soda lime/Baralyme [CO2 absorbers] or other devices) should be serviced / replaced as per manufacturer's guidelines. Manufacturer recommendation should be available for IACUC review in these cases.