



THE UNIVERSITY OF TOLEDO

**SUBJECT: Vaporizer Calibration and Maintenance**

DATE: October 21, 2019

---

### **University of Toledo Standard Operating Procedure on Vaporizer Calibration and Maintenance**

#### 1. Introduction

Anesthesia machines and vaporizers must be in good working conditions to reduce anesthetic gas leaks, to ensure the best performance of scavenging equipment, and to provide the appropriate percentage of anesthetic delivery. The proper operation of these units is essential to minimize potential pain and suffering, to ensure the maintenance of reliable and safe anesthesia, and to minimize the potential of human health risks due to inadvertent exposure to anesthetic vapors.

#### 2. Procedure

- a. Accuracy of anesthetic agent output from a precision vaporizer must be verified annually. If the vaporizer has not been in use for more than a year, it must be verified prior to reinstating its use.
- b. If the concentration of gas delivered is  $\geq 15\%$  off of the target value, the unit must be serviced (i.e. calibrated) by qualified personnel or company.
- c. A sticker must be present on the vaporizer indicating the most recent verification date.
- d. Vaporizers located within the Department of Laboratory Animal Resources (DLAR) will be managed by DLAR. However, Principal Investigators will be responsible for any service fees required on PI-owned vaporizers within DLAR. For vaporizers located outside of DLAR, it is the responsibility of the PI to schedule this service and pay service fees as applicable. The UT Biomedical Engineering department offers this service. <https://www.utoledo.edu/depts/biomed/>
- e. The vaporizer must be maintained in an upright position to indicate liquid levels accurately.
- f. Vaporizers manufactured for isoflurane may not be used for any other inhalant anesthetic.
- g. Supply gas should be compressed oxygen (99.99% pure) or medical grade air. Exceptions to this should be approved in the IACUC protocol.
- h. Waste anesthetic gas (WAG) must be scavenged through active or passive means. Active scavenging involves an active airflow system that draws WAG away from the

researcher into an in-house WAG exhaust line, chemical fume hood, canopy hood or snorkel. Passive scavenging methods involves passing the WAG through an activated charcoal canister, after which it is discharged into the room.

- i. If charcoal canisters (i.e. F/air) are used for scavenging, record the initial canister weight and the weight after each use on the canister. Follow manufacturer's recommendations for extent of canister use. Canisters typically must be discarded after a 50g increase in weight. Spent canisters may be disposed of in regular trash.
- j. Personnel must be trained in the proper use of anesthetic machines and vaporizers prior to use. Consult the DLAR website for training information.