Equipment Maintenance Guidelines

The following guideline was developed to help ensure proper functioning of equipment to maintain safety for both animals and the personnel. Training in proper use of equipment and anesthesia of research animals can be requested from Veterinary Resources (VR). Concerns regarding possible leakage from an anesthetic system or potential personnel hazards associated with exposure to volatile anesthetics should be directed to UMB Environmental Health and Safety (EHS).

Autoclave

Sterilization is defined as the killing of all living microbial organisms including bacterial spores. Steam autoclave sterilization effectiveness depends on adequate steam penetration, temperature and time. Autoclave performance should be validated at least semiannually using biological indicators with commercially available thermophilic bacterial spores test. Vials containing spores are placed within a pack or pouch and the pouch placed in middle of other items to be sterilized on a standard cycle. Post cooling, the tubes are removed and incubated (*per spore test manufacturer's directions*) to verify lack of growth adequate sterilization. These biologic indicators may be purchased from VR if you do not have a supplier available.

Biological indicator results and/or records of autoclave maintenance (i.e., repair records) should be kept near the autoclave in a folder for inspection upon request.

Examples of biological indicator test from mesalabs.com

Anesthesia Machine

- **Vaporizer Equipment**

  Because inhalant anesthetics have different vapor pressures, precision vaporizers should only be used for the anesthetic agent for which they were manufactured. Alternatively, vaporizers may be converted for use with another anesthetic agent by a certified vendor.

  Preventive maintenance including calibration and certification of all equipment parts involved in gas delivery needs to be done annually by a qualified contractual technician. Vaporizers should have a certificate of the calibration date affixed after each service. Newly purchased anesthesia machines first preventive maintenance and calibration is due on or before 12 months after receipt/purchase. Out of date vaporizers may not be used until certified by a qualified contractual technician.

  Vendors that offer certification services, and are used by VR or other UMB PIs, include:
  - Dalco Medical Products, Inc. (410-276-2500)
  - Atlantic Biomedical, Inc. (800-550-8310)

- **Anesthetic Waste Gas Scavenging Equipment**

  Charcoal Canister

  The effectiveness of a charcoal canister is monitored by changes in the canister's weight. Canisters should be dated when put into use. The canister should be weighed prior to the first use and regularly after each use to assure they have not reached full saturation. The weights and dates of weighing should be recorded directly on the canister (or on an associated log). These canisters must be used and discarded according to the manufacturer's instructions.

  Exhaust ports on canisters should not be blocked, and the canister should be oriented according to manufacturer recommendations. NOTE: "F/air" units must be placed on a 'venting stand' as the exhaust exits from the bottom of this brand of canister. Other brands exhaust from the top of the canister and those may stand/sit upright directly on table/lab bench surface, i.e., VaporGuard.

www.braintreesci.com

www.vetequip.com

  CO2 Absorbent (*i.e., Sodasorb®*)

  Chemical reaction between CO2 and soda lime generates heat and water and this increases pH. Most absorbents contain a chemical indicator that reacts with the pH changes. During and at the end of each surgery, the canister must be evaluated for color change. Soda lime must be changed when 2/3 of the canister has changed color.

  Other exhaust methods should be discussed with VR and/or EHS prior to use.

Sterilization of Hamilton Syringes

Syringes must be sterilized before each use. Hamilton Company recommends the use of Microcide SQ (Hamilton Part No. 3995-01) for sterilization. Use of 10% bleach, acetone or ethanol are acceptable but are not rated to be as effective as Microcide SQ (Hamilton Syringe Care and Use Guide; *available under Downloads*).

Desiccators Jars used with Inhaled Anesthetics

The desiccator jar must be used in a chemical fume hood or Class II B2 Biosafety Cabinet (Unit that exhaust to exterior of building) to protect personnel from waste anesthetic gases. Jars are to be sanitized before first use, between animals if urine or feces is present and after last use on any day with appropriate disinfectant. The animal must be placed on a perforated platform that allows normal movements but prevents direct contact with the liquid anesthetic agent located in the bottom of the desiccator jar.

Behavioral Testing Equipment

Behavioral testing equipment must be constructed with a sanitizable, non-porous material. Wood is not acceptable unless sealed (*e.g., with polyurethane cured per manufacturers recommendations prior to use*). Behavioral testing equipment is to be sanitized before first use, between animals if urine or feces is present and after last use on any day with appropriate disinfectant.

Rodent Guillotine Units

Guillotine units must be maintained in good working order (*rust free, lubricated as needed*) and serviced on a regular basis to ensure the sharpness of the blades. Blades must be able to decapitate with minimal force and should be cleaned of gross organic materials between animals. Records of maintenance and/or repair must be maintained and made available for inspection upon request.