

STANDARD OPERATING PROCEDURES
DIVISION OF COMPARATIVE MEDICINE
UNIVERSITY OF SOUTH FLORIDA

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TITLE:	SurgiVet Hot Line Fluid Warmer®
SCOPE:	Research and Animal Care Personnel
RESPONSIBILITY:	Facility Manager, Professional and Administrative Staff
PURPOSE:	To Outline the Proper Procedures for Fluid Line Warmer Use and Maintenance.

I. PURPOSE

1. This procedure outlines the use and maintenance of the SurgiVet Hot Line Fluid Warmer to maintain body temperature in research animals during procedures and post-procedurally, when loss of body temperature may be a concern.

II. RESPONSIBILITY

1. The Facility Manager ensures that equipment is appropriately cleaned, maintained in good working order, and available for research personnel as requested.
2. The veterinary professional, administrative, and managerial staffs ensure that all research and technical staff using this equipment are adequately trained and experienced.

III. BACKGROUND

1. The fluid warmer delivers fluids and blood at normothermic temperatures at routine flow rates of 50 to 5,000 mL/hr. It provides active warming of the animal/patient line to the distal connection protecting the animal/patient line against exposure to the cold ambient air and eliminates animal line cool-down. Active warming is achieved by surrounding the sterile intravenous fluid path with a layer of temperature-controlled circulating warm water. This is not for use with devices generating more than 300 mmHg pressure.
2. Fluid warmers may be used during survival procedures, acute non-survival procedures involving non-rodent mammals, or during anesthetic recovery.
3. Provision of new warming sets for acute non-survival procedures will occur as deemed necessary (e.g.: when damaged, when excessively soiled, etc.), or prior to beginning a single or series of survival surgeries. If utilized during a series of survival surgeries, the unit should be replaced with a new set prior to beginning of the first case of the day.

IV. EQUIPMENT USE

1. Preparation and set-up:

- a. Clamp the warmer at or below 42 inches from the floor to an intravenous (IV) pole, ensuring the air vents on the back and bottom of the warmer are clear.
 - b. Remove the L-70 port connector plug from the socket on the warmer, and the fill port plug on the water tank. Fill water tank with 1.4 liters of 0.3% hydrogen peroxide solution: mix 140 mL of 3% hydrogen peroxide and 1,260 mL of distilled water.
 - c. Do not fill the water tank with a warming set in place, or an air lock may occur.
 - d. Replace fill port plug.
 - e. Plug the warmer into the outlet.
2. Instructions for use:
- a. Supplies: fluid warming set (L-Series Hotline Fluid Warming Set), IV fluids, IV administration set, extension set (optional).
 - b. Check that the fluid level is above the minimum level mark on the tank. Add solution to the tank through the fill port if required. Plug into power outlet.
 - c. Set-up of fluid warming set:
 1. Plug the twin-tube connector into the socket on the right side of the warmer.
 2. Activate the power switch on the left side of the warmer. The green light on the display panel will illuminate, and the circulating water bath temperature display will begin to increase.
 3. The circulating fluid path will automatically prime when the unit is turned on. Inspect the animal end of the tubing for leaks to confirm the integrity of the IV pathway.
 - d. Connection of IV administration set:
 1. Connect the IV fluid bag and the IV administration set to the Hotline warming set.
 2. Fully prime the IV administration set, the Hotline warming set, and the extension set if used.
 3. Connect to the animal's IV access site without entrapping air.
 - e. The unit is ready for use when the recirculating fluid temperature reaches 41⁰C. Adjust the rate of IV fluids as needed. Do not clamp or restrict the water circulation through the tubing.
3. After Use:
- a. Turn off the power switch on the left side of the warmer.
 - b. Wipe down external surfaces of the warmer with mild detergent, water, and a soft cloth. For external disinfection, 10% bleach in distilled water may be used.

V. MAINTENANCE

1. Before use, visually check the condition of the unit. Remove from service any unit which shows physical damage or in which the warming set does not install easily.
2. Clean unit surface by wiping down with mild detergent and water before and after use. External surfaces can be disinfected by wiping with an appropriate disinfectant (e.g., 10% bleach, Clidox, Sporicidin).

3. Lubricate O-ring seals as needed Using a cotton swab apply a small amount of silicone lubricant to the O-rings.
4. Replace O-ring seals as needed when unit is in-service according to manufacturer's operation manual.
5. Perform disinfection procedure every 12 months when unit is in-service and before/after long-term storage:
 - a. Unplug the unit before servicing.
 - b. Remove the fill port cap.
 1. Empty all water from the reservoir tank and fill the water tank with 1.4 L of 0.3% hydrogen peroxide/distilled water solution: mix 140 mL of 3% hydrogen peroxide and 1,260 mL of distilled water.
 - c. Insert a warming set into the machine.
 - d. Turn the unit on and let the solution circulate for 30 minutes.
 - e. Switch the unit off and empty.
 - f. Thoroughly rinse the unit with distilled water.
 - g. Refill the reservoir tank with 10% hydrogen peroxide solution unless storing.
6. Storage
 - a. Store in a cool dry place. Do not expose to extreme temperatures.
 - b. Short-term – unplug warmer, and coil power cord.
 - c. Long-term – unplug warmer, coil power cord, and perform disinfection procedure; do not refill the reservoir tank. Repeat disinfection procedure prior to use.
7. Record date, initial, and circle the appropriate maintenance interval on the equipment hang tag to indicate that all maintenance and testing for that interval were completed.
8. Facility Managers are responsible for maintaining current records of Division-owned equipment inspections, calibrations, maintenance, non-routine repairs, and current inventory for their facility on the division's ***Equipment Maintenance Log (CMD#192)***.

VI. TESTING

1. Every 12 months when unit is in-service or prior to use if frequency of use is less than annually, perform a test of the alarm switch, fluid over-temperature alarm, add-water alarm, and disposable alarm, and verify temperature according to manufacturer's operation manual.
2. Report any damage or malfunctions to the Facility Manager.

VII. REFERENCES

1. For additional information, see manufacturer's operation manual.

Approved:

Date: