

**STANDARD OPERATING PROCEDURES**  
**DIVISION OF COMPARATIVE MEDICINE**  
**UNIVERSITY OF SOUTH FLORIDA**

SOP#: 1124.5

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<b>TITLE:</b>	<b>GAYMAR® Circulating Thermal Water System</b>
<b>SCOPE:</b>	Research and Animal Care Personnel
<b>RESPONSIBILITY:</b>	Facility Manager, Surgical Core Manager, Professional and Administrative Staff
<b>PURPOSE:</b>	To Outline the Proper Procedures for Circulating Water Pad Use and Maintenance.

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**I. PURPOSE**

1. This procedure outlines the use and maintenance of the GAYMAR T/Pump and T/Pad heat therapy system using warm circulating water system to maintain body temperature in research animals during procedures, and post-procedurally, when loss of body temperature may be a concern.

**II. RESPONSIBILITY**

1. It is the responsibility of the Facility Manager in conjunction with the Surgical Core Manager to ensure that equipment is appropriately cleaned, maintained in good working order, and available for research personnel as requested.
2. It is the responsibility of the veterinary professional, administrative, and managerial staff to ensure that all research and technical staff using this equipment are adequately trained and experienced.

**III. BACKGROUND**

1. The GAYMAR T/Pump® provides temperature controlled water through a connector hose to a GAYMAR T/Pad® for the delivery of heat to anesthetized and recovering animals. External heat sources are effective in the maintaining homeostasis and reducing hypothermia associated with the use of anesthetic drugs.
2. Circulating water pads will be used during survival procedures, acute, non-survival procedures involving non-rodent mammals, during rodent procedures and anesthetic recovery with monitoring, or as a source of warmth after rodent post-procedure recovery from anesthetics and return to housing without monitoring

#### IV. EQUIPMENT USE

**Caution: Inappropriate use can result in animals being injured.**

**1. Start up procedure:**

- a. Prior to use, inspect T/Pads to ensure the pad and hoses are free of cuts, tears and rubber o-rings are intact. Check that the electrical cord is intact and no wires are exposed.
- b. Before filling the pump, always attach a pad to the connector hose or close the clamps on the connector hose ends. Then, unkink pad and hose.
- c. Open the fill cap on top of the pump. Fill pump with room temperature (i.e., not hot) **distilled water** to the operating level indicated on the side of the pump. **NOTE: Using tap water will decrease the life of the pump.**
- d. Insert temperature setting key. Set temperature to 105<sup>0</sup>F or as prescribed by the veterinarian. Remove key to prevent tampering.
- e. Plug T/Pump into properly grounded outlet.
- f. Turn on the power switch. The selected water temperature will be reached in approximately 20 minutes.
- g. If the water level drops below the operating level, add water. **Do not overfill. Overfilling can result in reduced pump motor life.**
- h. Apply T/Pad to the patient using a single layer of absorbent material between pad and patients skin (e.g., chux pad).
- i. For specified performance keep pump at or above the level of the pad.
- j. If the pump is placed below the pad, water will drain into the pump when it is shut off. If the pump has been overfilled or if multiple pads are connected, excess water can leak out onto the floor or cause reduced motor life.

**2. Shutdown procedure:**

- a. Turn off pump before disconnecting pad(s). Close all hose clamps. To prevent water spillage, always disconnect pad from pump with connectors raised above the level of the pad and pump.
- b. Connect the pump and T/Pad Clik-Tite connectors together, where applicable.

**3. Monitor the patient periodically** at least every 45 minutes to determine that that the source of heat and the surface of the anesthetized animal are not too hot by assessing with a hand placed between the animal and the source of supplemental heat, and by monitoring core body temperature.

**4. Use during acute and non-acute procedures involving non-rodent mammals:**

- a. Set temperature to 105<sup>0</sup>F
- b. Place water pad on top of padding comprised of three or more layers of thick towels/blankets or a covered, sanitizable foam mattress to insulate the patient from the surgery table.

- c. Place 1 layer of disposable blue underpad (e.g., chux) over the warmed thermal water pad as insulation between it and the patient's skin.
  - d. Disposable warm water circulating pads can be used both above and below the anesthetized patient animal. Heated water blankets wrapped around the feet and legs of all available limbs has been shown to prevent heat loss better than when a heating blanket is applied to the trunk of anesthetized dogs.
  - e. Only thermostatically controlled water blankets with heat source will be used as a source of intra-operative warmth during procedures involving non-rodent mammals.
5. Use with **rodents intra-operatively and immediately post-operatively while monitored:**
- a. Set temperature to 105<sup>0</sup>F
  - b. Place a disposable blue underpad (chux), or surgical drape on top of water pad.
  - c. Avoid using any sharp objects, instruments or pins on water pad as damage and subsequent leakage will occur.
  - d. During recovery from anesthesia, animals may be placed in a microisolator resting on the water pad while being continuously monitored. Animals must be turned over at least every 20 minutes, until capable of purposeful movement.
6. Use with **rodents after postoperative recovery from anesthesia:**
- a. When animals are capable of purposeful movement rodents may be left or placed back into microisolator caging using the water pad as an external source of warmth.
  - b. Set temperature to 105<sup>0</sup>F.
  - c. Place approximately 1/8" of bedding or a single layer of absorbent material between the animal and the cage bottom.
  - d. Position microisolator caging on water pad so that approximately ½ the cage-floor is in contact with the water pad. This will allow the animal to move towards or away from the heat source.

#### IV. MAINTENANCE

1. Inspect condition of unit and electrical cord/plug to ensure safe operation. Equipment determined to be unsafe will be removed from service immediately.
2. **Storage:**
  - a. For **short term storage**, disconnect pad. Connect ends of the connector hoses together, where applicable. Open hose clamps. Leave water in reservoir. To prevent hose kinks, coil the hose rather than folding it. Fasten the hose and cord with strap.
  - b. For **Long term storage**, connect pad. Open hose clamps. Add ¼ ounce AirKem A-33, Gaymar MTA33 germicidal, or equivalent to water already in reservoir. Run for two (2) minutes. Drain pump. Close hose clamps. Disconnect pad. To prevent hose kinks, coil the

- hose rather than folding it. Fasten the hose and cord with strap and store pump.
- c. **T/Pad storage:** Loosely roll up pad and store until next use.
3. **Draining:** Disconnect the T/Pump from AC power. Disconnect the pad or hoses from one another, keeping hoses at or above the level of the T/Pump. Remove the fill cap and invert the T/Pump over a sink. When all fluid has drained from the hoses and reservoir, replace the fill cap and connect the hoses together, where applicable.
4. **Cleaning:**
- a. **outer surface** of the T/Pump:
- Damp cloth and soapy water
  - Fantastik spray cleaner, or
  - Mild abrasive such as Soft Scrub cleaner without bleach
- b. To clean the **fluid system:**
- Prepare a germicidal solution according to the manufacturer's instructions.
  - Drain pump
  - Fill reservoir to fluid operating level
  - Set temperature to lowest level
  - Turn on pump and allow water to circulate for 1 hour
  - Drain pump and refill with distilled water
- c. To clean **water T/Pads:**
- Manually clean both sides of pad using warm water and a mild commercial detergent, and a clean cloth.
  - Thoroughly rinse and allow to dry
  - Apply disinfectant such as 10% bleach and allow to dry
  - Reusable pads can be cleaned and reused as long as they do not crack or leak.
5. Using distilled water will not promote algae growth or mineral buildup.
6. For additional information see manufacturer's operation manual.
7. Report any damage or malfunctions to the Surgical Core Manager.

**Approved:**

**Date:**