SURGICAL PROCEDURE DESCRIPTIONS

GONADECTOMY: CASTRATION USING SCROTAL METHOD
1. The animal is anesthetized and placed in dorsal recumbency with the tail toward the surgeon.
2. The abdominal and scrotal area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. A small median incision, about 1 cm, will be made through the skin at the tip of the scrotum.
4. The testicle is exteriorized by blunt dissection of the tissue, while the testicle is inside the parietal vaginal tunic (commonly referred to as a "closed" castration).
5. A ligature is placed using absorbable suture around the parietal vaginal tunic proximal to the testicle. The parietal vaginal tunic is cut distal to the ligature to remove the testicle.
   *If the parietal vaginal tunic is inadvertently opened during the procedure (commonly referred to as an "open" castration), ligate the vas deferens and blood vessels using cautery or absorbable suture. Cut distal to the suture, to remove the testicle. In the case of the open castration, a final ligature will be then placed around the parietal vaginal tunic.
6. The scrotal incision is closed with skin glue or wound clips.

GONADECTOMY: CASTRATION USING ABDOMINAL METHOD
1. The animal is anesthetized and placed in dorsal recumbency with the tail toward the surgeon.
2. The abdominal area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. A midline skin and muscle incision is made cranial to the penis.
4. One of the testicles, epididymis, vas deferens, and spermatic blood vessels are exteriorized by gently grasping the peri-testicular fat (associated fat) located in the caudal abdomen.
5. The vas deferens and spermatic blood vessels are cauterized on mice, and cauterized or ligated with absorbable suture on larger rodents (i.e. rats, hamsters). The vas deferens and spermatic blood vessels are transected distal to the site of cautery or ligature.
6. The remaining tissue is replaced into the abdominal cavity.
7. The procedure is repeated contralaterally.
8. The abdominal muscle wall incision is closed with absorbable suture in a simple interrupted pattern.
9. The skin is closed with wound clips.

INTRACEREBRAL MICROINJECTION
1. The animal is anesthetized and placed in ventral recumbency.
2. The head area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. A small single incision will be made on the midline on top of the head to reveal the underlying bone fissures. The position of the cannulae will be determined based on experience (e.g. no stereotaxic atlas for Siberian hamsters) or, as it relates to other species, determined via the use of a stereotaxic atlas.
4. A hole through the skull will be trephined to allow insertion of the guide cannulae to the appropriate depth.
5. The cannulae will be anchored to the skull with strategically placed jeweler’s screws, cyanoacrylate ester glue base and then dental acrylic.
6. The incision will be closed with wound clips or non-absorbable suture being careful not to impair the eyelids.
7. Microinjections will be made through an infusion cannula that penetrates past the tip of the guide cannula. Between injections, a sterile obturator will be inserted in the guide cannulae.

LIPECTOMY
1. The animal is anesthetized and placed in dorsal recumbency.
2. The abdominal area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. An abdominal incision is made for epididymal or retroperitoneal white adipose tissue removal, whereas a dorsal subcutaneous incision is made for inguinal or dorosubcutaneous white adipose tissue removal.
4. Pending the intent of the experiment, one of the pair of fat pads are removed (i.e. one inguinal), both pads of the pair are removed (e.g., both epididymal), or combinations of single and double removal occur (one inguinal, two epididymal etc).
5. The fat pads are removed by blunt dissection to minimize bleeding.
6. Depending upon the site of removal, the muscle incision is closed with absorbable suture.
7. The skin incision is closed with wound clips (all pad removals).

OSMOTIC MINIPUMP IMPLANTATION: SUBCUTANEOUS INFUSIONS
1. The animal is anesthetized.
2. The area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. An incision is made in the skin, and the skin is bluntly dissected away from the muscle layer creating a pocket for the minipump.
4. The sterile minipump is inserted subcutaneously.
5. The incision is closed with wound clips.
   *This may have to be repeated for long duration experiments to replace old pumps with new ones.

OSMOTIC MINIPUMP IMPLANTATION: INFUSION INTO A BRAIN CANNULA
1. The animal is anesthetized and placed in ventral recumbency.
2. The head and dorsum area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. An incision is made in the skin.
4. The sterile minipump is inserted subcutaneously.
5. The pump is connected via sterile tubing tunneled under the skin to a head cannula (head cannula surgical placement described elsewhere).
6. The incision is closed with wound clips.
   *This may have to be repeated for long duration experiments to replace old pumps with new ones.

OSMOTIC MINIPUMP IMPLANTATION: INFUSION INTO A VESSEL
1. The animal is anesthetized.
2. The area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. An incision is made in the skin, and the skin is bluntly dissected away from the muscle layer creating a pocket for the minipump.
4. The sterile minipump is inserted subcutaneously.
5. The pump is connected via sterile tubing tunneled under the skin to a cannulated vessel (vessel cannulation surgical placement described elsewhere).
6. The incision is closed with wound clips.
   *This may have to be repeated for long duration experiments to replace old pumps with new ones.

OVARIECTOMY
1. The animal is anesthetized and placed in ventral recumbency.
2. The dorsum is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. A small incision is made in the skin approximately half way between the shoulder-blades and the base of the tail.
   *Alternatively, a ventral midline incision is made with the animal positioned in dorsal recumbency.
4. The skin is bluntly dissected away from the muscle to allow for movement to either side laterally.
   *Alternatively, bilateral incisions are made in each flank.
5. A muscle incision is made about 2/3 of the way down the side of the body. The ovary, surrounded by fat should be directly underneath the incision.
6. The ovary is exteriorized through the incision by grasping the peri-ovarian fat (fat around the ovary). Care is taken to avoid touching the ovary itself.
7. Fat and blood vessels are dissected away from the junction of the Fallopian tube and the proximal uterine horn. The proximal uterine horn is cauterized or ligated with absorbable suture, then the proximal uterine horn is transected.
8. The muscle wall incision is closed with absorbable suture using a simple interrupted pattern.
9. The skin incision is closed with wound clips.

PERFUSION (TERMINAL PROCEDURE)
1. The animal will be anesthetized and placed in dorsal recumbency.
2. The hair is wet down with alcohol (or hair will be clipped).
3. An incision is made along the thoracic area. Scissors or a sharp scalpel blade is used to cut along the ribs to expose the thoracic cavity.
4. A (blunted) needle is inserted into the left ventricle and a small incision is made in the right atrium.
5. The perfusion pump is started, typically with saline. Once the liver is blanched, the switch is made from saline to fixative.
* If upper body perfusion is only needed, the descending aorta is clamped distal to the liver.

PINEALECTOMY
1. The animal is anesthetized and placed in ventral recumbency.
2. The head and dorsum area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. An incision is made over the skull and a trephine is used to make a hole in the skull above the confluence of the sinuses.
4. The sinus is penetrated with a fine-toothed forceps to remove the pineal gland.
5. A gelatin pellet is inserted into the trephined hole to stop bleeding.
6. The incision is closed with sterile wound clips.

SILASTIC CAPSULE IMPLANTATION:
1. The animal is anesthetized and placed in ventral recumbency.
2. The dorsal scapular area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. A 0.5 cm incision is made in the skin, and the skin is bluntly dissected away from the muscle layer creating a pocket for the capsule.
4. The sterile silastic capsule is inserted subcutaneously.
5. The incision is closed with wound clips.

VESSEL CANNULATION:
1. The animal is anesthetized and placed in dorsal recumbency.
2. The neck area is shaved and cleaned with surgical scrub according to the GSU Aseptic Technique for Animal Surgery Policy.
3. An incision is made in the skin on the ventral surface of the neck and blunt dissect through the muscle. The external jugular vein (at least a cm) is then exposed.
4. A silk suture is tied tightly at the anterior end of the vein. A very loosely tied suture is placed around the posterior end of the vein (do not close the knot).
5. A “catheter introducer” is inserted into the vein between the two sutures.
6. The catheter (typically Silastic tubing) is inserted into the vein and advanced towards the heart.
7. The posterior suture is closed around the vein and catheter to fix the catheter in place. Another suture is placed around the vein and catheter nearer the anterior end of the vein.
8. The other end of the catheter is tunneled subcutaneously to exit the animal through a small skin incision on the dorsal surface of the neck.
9. The catheter is encased in dental cement, and anchored to a square of durable mesh for subcutaneous placement in the mid-scapular region to stabilize the
catheter and keep it from moving. Care is taken to assure that there is enough
catheter length to allow for animal movement and growth so as not to dislodge the
catheter from the vein.

10. The patency of the catheter is checked by gently aspirating blood from the vessel
and then flushed with saline, followed by a heparin/saline (hep-lock).

11. The end of the catheter is capped with a stainless steel pin.

12. The skin is closed with wound clips.

**Pertinent Regulations***

U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in
Testing, Research, and Training

Public Health Service Policy

Guide for the Care and Use of Laboratory Animals

Animal Welfare Act (AWA) and AWA Regulations

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**Signature IACUC Chair:**

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