Rodent Surgery Set-Up

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Survival rodent surgery does not require a dedicated room, but should be done in a clean, well organized space that will not be used for other activities during the survival surgeries.
Separate areas should be provided for surgery, animal prep, surgeon prep, and preparing and sterilizing the surgical instruments/packs.

Pre-op preparations include checking the level of critical supplies including oxygen. Oxygen tanks should be replaced if they have less than 500 psi pressure.
When replacing an oxygen tank the pressure should be checked to verify the new tank is full and the status card torn to show the tank has been placed in service.

The pressure in a full tank should be approximately 2000 psi.
Each time a tank is changed the connection should be checked for leaks by spraying the connection with a soapy solution.

If a leak is present the soap will form lots of bubbles.
Simply tightening the yoke will usually stop the leak. If not, the gasket between the tank and the yoke should be replaced and the yoke retightened.

The anesthesia machine should be checked to ensure there will be adequate waste gas scavenging and there is adequate anesthetic available.
The liquid anesthetic should be between the minimum and maximum fill lines.

Items that take an extended time to warm up, e.g., hot bead sterilizers, water blanket heaters, etc., should be turned on well ahead of surgery time.
Items needed for surgery are gathered including:

- instruments.

Surgical gloves and a sterile instrument drape.
Ancillary supplies: e.g., syringes and needles, scalpel blades, suture material, extra gauge sponges, etc.

A plain sterile drape can be used to provide a sterile area for instruments and supplies.
Sterile surgical supplies commonly have over-sized flaps to make it easier to open them by “rolling” the flaps apart to avoid touching and contaminating the contents.
Once the edge of the drape is exposed it is grasped by one corner.

The drape is removed from the package and unfolded well away from the body and any counters that might contaminate the sterile drape.
The drape is then placed over the surgical instrument area.

And laid out flat to receive the instruments.
Instruments and supplies are then “dropped” onto the drape.

Instruments should be dropped from a distance close enough they don’t bounce off the drape.
And far away enough they don’t hit the drape and fall back on the surgeon’s hands or arms.

Ancillary supplies are placed on the drape in the same way.
Needles wrapped in paper and plastic with “surgery Flaps” are easier to place on the drape uncontaminated.

Once all the instruments and supplies have been placed on the drape, it is folded
To cover the instruments and prevent contamination during the placement and prep of the subject.

The subject is then anesthetized.
The animal is weighed.

The pre-op analgesic and fluids readied for injection.
Eye ointment is applied to prevent drying of the corneas during surgery.

The animal is ready for the surgical site prep.
The surgical site is clipped.

The loose hair removed.
Use of “keyboard vacuum” attachment avoids excessive suction on the animal’s skin.

Once the hair has been clipped the skin is easy to see and the pre-emptive analgesic and fluids are administered. Subcutaneous placement is confirmed by visualizing the needle outline under the skin.
And the injected fluid will make a swelling under the skin.

By contrast, the needle outline is hardly visible when giving intraperitoneal injections, and
Injecting the fluid makes no visible swelling under the skin.

The surgical area is then scrubbed with at least three rounds of alternating “scrubs”, using 70% isopropyl alcohol and an iodophor (e.g., Betadine).
The first two scrubs are usually performed with alcohol first followed by Betadine.

A cotton-tipped applicator is used to apply the scrub solution directly over the incision site first then moved outward in circles until the entire surgical area has been cleaned.
A second scrub is made with alcohol.

Followed by a second scrub with betadine.
The animal is then transferred to the surgery table, restrained and any monitoring equipment attached (e.g., rectal temperature probe).

The third surgical scrub is performed using Betadine first.
The last alcohol scrub will remove most of the iodine and reduce its ingestion after surgery.

The animal is now ready for surgery.
If working alone it is helpful to “pre-hang” drape material for easy retrieval once sterile surgical gloves have been donned. While not absolutely sterile, the composition, manufacture, and packaging of commercial plastic wrap excludes pathogens and can greatly reduce contamination of the surgical area.

Use a piece of drape material long enough to cover the subject and extend onto the instrument tray. Touch only one end of the drape.
The touched or “dirty” end of the drape is then pressed against two pieces of tape placed near the surgery table.

The surgeon completes preparation by washing his/her hands and donning surgical gloves.
The surgery glove pack is opened.

The interior package opened so the right hand glove is on the right.
The interior paper liner is opened taking care to only touch the outside surface of the paper. The lower flap is folded down.

The bottom of the vertical flaps are grasped at the lower edge.
And pulled fully open.

If right handed, use the right hand to grasp and lift the cuff of the left glove touching ONLY the surface that will become the INSIDE of the glove.
Place the fingers of the left hand into the glove and move the glove away from the sterile liner to more fully insert the left hand into the glove. Be sure to stop with the thumb just short of the cuff edge.

Place the four fingers of the left hand under the cuff of the right glove.
Spreading the fingers of the left hand to grasp the right glove, insert the right hand into its glove. Continue spreading the cuff of the right glove to prevent the edge from rolling,

And pull it fully up and over the sleeve covering the arm.
Then slide the four fingers of the gloved right hand under the cuff of the left glove.

And spreading the right fingers to grasp the cuff and preventing the cuff from rolling, pull the left glove up and over the sleeve covering the arm.
Once both hands and arms are completely covered, the gloves can be adjusted.

By pulling down on the glove’s fingers they will closely conform to the surgeon’s finger tips.
The sterile surgical gloves can now be used to touch the sterile side of the instrument drape.

Open the drape to expose the instruments and supplies.
Organize the instruments and supplies on the lower half of the drape. It helps to place the instruments in the order they will be used with their tips aligned.

A general mouse surgery pack generally includes atraumatic (toothed forceps), small scissors, a few sharp pointed forceps, needle holder, fine scissors, and staple or wound clip applicator.
Atraumatic forceps come in a variety of shapes and sizes. Those with wider handles are generally less tiring on the thumb and forefinger. For general use the tips should have 1 X 2 teeth and be < 0.5 mm wide at the tip for mice, and < 1.0 mm for rats.

Dumont # 4 and 5 fine tipped forceps are available in a variety of lengths and finishes with the tips straight or angled.
The tips of the Dumont # 4 and 5 forceps are approximately 0.1-0.2 mm.

“Tru-Cut” scissors have a serrated edge on one blade which helps prevent slippage when cutting tissue and suture.
If working alone it is helpful to have a bottle of saline taped to the edge of the table so it can be accessed without having to touch the bottle.

The saline can be held in a small bowl or syringe cap on the instrument drape and used for irrigation and cleaning instruments between surgeries.
Once the animal has been prepared and the instrument area organized, the pre-hung surgical drape can be grasped at the “clean” untouched end.

The drape is placed so the “dirty” end is left outside the surgical area and the “clean” end extends over the instrument drape a short distance.
This makes a continuous “aseptic” surgical area preventing the contamination of instruments and suture material by avoiding contact with the table and unprepped areas of the animal.

Proper surgical attire for the surgeon includes: hair covering, surgical mask, lab coat or surgical gown and sterile surgery gloves.