

## **Surgery Model #: JVC-R**

### **Jugular Vein Catheterization (JVC) Care and Use Document for the Rat**

*Anesthetic: Isoflurane to effect*

*Analgesic: Buprenorphine (SQ): Rat Dose 0.05 mg/kg*

#### **Basic Surgical Procedure Description:**

An anesthetized and surgically prepared animal is positioned under a dissecting scope in dorsal recumbency. A 2cm ventral cervical skin incision is made right of the midline with its caudal terminus at the level of the clavicle. Underlying salivary and lymphatic tissues are separated by means of blunt dissection to visualize the right common jugular vein. Five millimeters of vessel cranial to the site where the jugular vein passes under the clavicle is mobilized. A sterile JVC is inserted into the vessel and secured in place with suture. Catheter patency is assessed at this time and once patency is established, the catheter is flushed with 200 µL saline and filled with lock solution. A 0.5cm midline skin incision is made between the scapulae. The JVC port is tunneled back through the scapular incision. Skin incisions are closed and the catheter port is secured with a stainless steel wound clip. The port protrudes through the center of the clip and the port's anchoring bead should remain under the skin.

#### **Catheter:**

Catheter material consists of sterile polyethylene (PE) tubing with a silicone rubber intra-vascular tip. The access port consists of a 25mm length of PE50 tubing (0.023" ID) sealed with a sterile stainless steel pin. 23 gauge blunted needles are required to access the port. Fill volume of the catheter is 20µl. Upon customer request, catheter may be made of a single piece of polyurethane.

#### **Lock Solution:**

Heparinized Glycerol (500 IU/ml): 10.0 mL stock heparin (1000 IU/mL) + 10.0 mL 99% Glycerol solution (Sigma).
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#### **Quality Control:**

Patency is verified by the ability to withdraw a blood sample within 24 hours of shipment and is guaranteed upon animal receipt. To maintain animals over longer periods of time, catheters need to be flushed twice a week (once every 3-4 days). Catheters can be flushed by following the sampling procedure below minus the withdrawal of the whole blood sample.

#### **Sampling:**

JVC's are reliable for obtaining blood samples over the course of hours or even day(s). 200-300 gram rats can tolerate 1000 to 1500µl of total blood withdrawal in a 24 hour period; sample size can vary, but recommendations are in the range of 200-300µl. Sample size and frequency should be minimized to essential time points to maintain the health of the animal.

For blood withdrawal, gather the following materials: Syringe assemblies (1cc syringe attached to a 23G blunted needle), sterile saline and sterile fill solution.

- 1.) Place animal in a restrainer (small open topped boxes the size of a pipette container work well)

***Important: Always clamp the port with rubberized or smooth hemostats to prevent unintended blood flow and port damage when changing syringes and flushing the catheter.***

- 2.) Clamp port and remove the pin from the catheter and set aside
- 3.) Insert an empty syringe assembly (SA) into the port and release hemostats
- 4.) Gently withdraw fill solution and blood; clamp port
- 5.) Attach a second SA, release hemostats and withdraw sample (syringe may contain anticoagulant); clamp port
- 6.) Release hemostats and slowly flush catheter with sterile saline ~200µl (or greater to match blood withdrawal); clamp port
- 7.) Add 25µl of sterile lock solution, clamp port and replace pin

If blood fails to flow in step 4, remove the empty SA and replace with a SA containing sterile saline and gently flush the catheter and repeat as outlined above.

#### **Housing:**

Individually house animals to prevent cage mates from chewing on one another's catheters.

#### **Staple Removal:**

Staples should be removed 7-10 days post-operatively; do not remove staple around catheter port.

**Notes: 1.** During animal manipulation (dosing / weighing) it is important not to place undue stress on the catheter. **2.** Using needles larger than 23 gauge will stretch the port and make sampling difficult. Additionally, sampling by means of needles with bevels or rough edges will damage the port, again making sampling difficult.