



Standard Operating Procedure (SOP)

Title: Anesthesia Induction and Maintenance	SOP No. SAIL-Xtreme-SOP-02
	Version No. 02
	Effective Date: July 28, 2017
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1. Purpose

This SOP describes and outlines the procedures for the isoflurane anesthetization of animals to be imaged in the SAIL Imaging suite (room E.S2.8100) to ensure that the animal is properly handled and anesthetized with a minimum of stress and effect on its long-term health in compliance with ACC standards.

2. Scope

Applicable to all the imaging studies using the In-Vivo Xtreme optical imager with protocols that utilize vaporized isoflurane as the primary anesthetic for the duration of the imaging session.

3. Responsibility

- 3.1 The study Principal Investigator(s) and/or his/her designate(s) designate is responsible for the well-being of the animal for during the imaging session within the SAIL Imaging suite. The SAIL Manager will provide assistance as required.
- 3.2 The study Principal Investigator(s) and/or his/her designate(s), is responsible for the regulation of anesthesia depth and should any complications arise from the procedure, he/she is responsible for the immediate resolution of said complication in a humane and ethical manner as per the particular study AUP and/or in-house policies in accordance to ACC regulations (UACC SOP-13 and UACC SOP-15).
- 3.3 It is the responsibility of the study Principal Investigator(s) and/or his/her designate(s) to ensure compliance with procedures involving the animal during the imaging session.
- 3.4 Only approved, trained users are permitted to operate the In-Vivo Xtreme optical imager.

4. Materials

- Isoflurane
- Anesthesia Induction chamber
- Isoflurane vaporizer
- Compressed oxygen
- Personal Protective Equipment (PPE)

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5.Procedure

5.1 Anesthesia Induction

- 5.1.1 Refer to the *Animal and Imager Preparation* (SAIL-Xtreme-SOP-01) and ensure that all necessary procedures have been observed prior to anesthesia procedures.
- 5.1.2 Check the level of isoflurane in the vaporizer. When the gauge shows that it is less than half full, fill the vaporizer with isoflurane.
- 5.1.3 Attach the vaporizer outlet tubing to the induction chamber, open the oxygen release valve and set the flow rate at approximately 0.6 L/min.
- 5.1.4 Remove the selected animal subject from its cage and place it in the clean anesthesia induction chamber, layered with brown paper towel.
- 5.1.5 Set the vaporizer to 4-5% isoflurane.
- 5.1.6 Once the animal seems unconscious, perform the paw pinch test to verify that the animal is adequately anesthetized.
- 5.1.7 Once anesthesia depth is sufficient, turn on the tridiverter's valve of the imaging tray and turn off the one of the induction chamber.

5.2 Anesthesia Maintenance

- 5.2.1 Take out the animal of the induction chamber and place it in the appropriate position, depending on the surface to image, on the tray of the imager inserting its head into the nose cone.
- 5.2.2 Allow animal's respiration rate to adjust, equilibrate, and stabilize to the new isoflurane concentration (maintained at 1.5-2% for the duration of the imaging).
- 5.2.3 Continue with *Animal and Imager Preparation* as per SAIL-Xtreme-SOP-01

5.3 Anesthesia Monitoring

- 5.3.1 Upon anesthetizing and installing the animal upon the imager's tray (SAIL-Xtreme-SOP-01), wait and observe the vital signs until they reach a steady-state.

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- 5.3.2 Ensure that the respiration remains within a suitable physiological range given the anesthesia depth. Acceptable ranges for respiration rate is between 85-155 breaths per minute for mice and 50-80 breaths per minute for rats). Lower isoflurane level if respiration rate is too low or increase it if it's too high.
- 5.3.3 Continue monitoring the vital signs readings each time you can open the imager's front door (e.g. between each acquisition, as outlined in the study AUP).
- 5.3.4 Once the imaging session is completed, exit the software and remove the animal from the tray Continue with the animal recovery procedures as indicated in SAIL-Xtreme-SOP-03.

6. References

SAIL-Xtreme-SOP-01: Animal and Imager Preparation

SAIL-Xtreme-SOP-03: Recovery

McGill SOP 110-Mouse anesthesia

McGill SOP 111-Rat anesthesia

7. Appendices

None

