



Standard Operating Procedure (SOP)

<b>Title:</b>  <b>Animal and Scanner Preparation</b>	<b>SOP No.</b> SAIL-PET-SOP-02
	<b>Version No.</b> 02
	<b>Effective Date:</b> July 28, 2017
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## 1. Purpose

This SOP describes and outlines the proper animal subject preparation and set-up of the SPECT/CT/PET scanner for scanning sessions.

## 2. Scope

Applicable to all studies involving scanning with the SPECT/CT/PET scanner.

## 3. Responsibility

- 3.1 The SPECT/CT/PET technician, under the supervision of the SAIL Manager, is responsible for maintaining safety and security standards within SPECT/CT/PET room.
- 3.2 The SPECT/CT/PET technician, under the supervision of the SAIL Manager, is responsible for the inspection and maintenance of the equipment within the SPECT/CT/PET room. As such, he/she is responsible for reporting any problem with and/or damage to the equipment to the SAIL Manager as soon as possible.
- 3.3 The SPECT/CT/PET technician is responsible for the reporting of any accidents and/or incidents that occur within the facility. These incidences will be documented and recorded on accident/incident forms as provided by SAIL in accordance with RI-MUHC policies.
- 3.4 Only trained SAIL SPECT/CT/PET technical staff is permitted to operate the SPECT/CT/PET scanner. If external observers and/or collaborators are to be involved in the scan process, their participation will need approval from both the SAIL Director and the Principal Investigator(s) involved in the study.
- 3.5 The pre-scan preparations preceding all scanning sessions as described on this SOP are the responsibility of the SPECT/CT/PET technician.

## 4. Materials

- Syringe filled with radio-ligand
- Butterfly catheter (optional)
- Lab bench-top liner
- Gloves

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## 5. Safety and Conduct

- 5.1 All personnel and/or collaborators who will need to enter the SPECT/CT/PET room must first present certification of having completed the McGill radioactivity safety workshop as offered by the McGill Occupational Health Services.
- 5.2 Be sure to always wear a lab coat and to cover all exposed body areas (no short sleeve garments or sandals; closed footwear only) before entering the SPECT/CT/PET room.
- 5.3 A certified radioactivity dosimeter must be worn at all times when in the SPECT/CT/PET room.
- 5.4 Disposable gloves must always be worn when handling radioactive substances. Change gloves frequently and dispose of used gloves in the designated radioactive waste container to prevent contamination of workspace.

## 6. Procedure

### 6.1 Scanner Preparation

- 6.1.1 Before beginning the first scan of the day, run the test scan protocol to ensure proper functioning of the scanner and to calibrate the detector.
- 6.1.2 Run a phantom scan of Ge-68 or Tc-99m, depending of the type of scan (PET or SPECT), to calibrate the detector.
- 6.1.3 Make a quick visual inspection of necessary equipment and materials. Replenish any low or missing materials (see Section 4: Materials)
- 6.1.4 Set up and turn on the pump of the bed and cover it with lab bench liner. Turn on and verify that the gas scavenger is functioning properly.
- 6.1.5 Perform a quick visual inspection of the general state of the lab and scanner. Clean any surfaces of the machine and lab space, if necessary.

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## 6.2 Animal Subject Preparation

- 6.2.1 Just prior to radioligand injection, take the filled syringe as per SAIL-PET-SOP-01 and using the dose calibrator, take a reading of its present radioactivity. Note the reading on the Scan Log Sheet.
- 6.2.2 Bring the radioligand in the carrying container to the shielded radioactivity workspace on the lab bench of the SPECT/CT/PET scanner room.
- 6.2.3 Identify and weigh animal and fill in the Pre-Scan fields on the Scan Log Sheet.
- 6.2.4 Anesthetize animal with 2% isoflurane as per SAIL-PET-SOP-03 (or other anesthesia as per AUP).
- 6.2.5 Perform pre-scan procedures if any (*i.e.* tail vein catheterization), as detailed in the study's approved imaging protocol.
- 6.2.6 For FDG studies, using a 25G needle, prick the hind foot of the animal and draw a little blood in order to measure the baseline glycemia using the blood-glucose meter. Note the resulting measurement on the Scan Log Sheet.
- 6.2.7 Position the animal on the procedure bench space under a warming heat lamp and inject the radioligand via the tail vein or installed catheter of the anesthetized animal. Record the amount injected and the consequent radioactivity injected (based on your pre-injection readings of the syringe volume). Register this injection as your scan  $t=0$ , and note the injection time on the Scan Log Sheet.
- 6.2.8 Remove contaminated gloves, dispose of them in the designated radioactive waste container, and put on a new pair of gloves.
- 6.2.9 Turn the isoflurane vaporizer setting to "OFF" and close the gas outlet valve. Remove the animal from the procedure bench space and place it in a new cage.
- 6.2.10 Once the animal is sufficiently awake, place radioactive warning labels on the cage, and place the cage in the shielded cage storage area in the hot room.
- 6.2.11 Leave the cage in the storage area the time for the radiotracer to distribute in the animal's system, according to species and radioligand used (usually 45 minutes). During this period, check to ensure that animal is healthy, and perform any procedures outlined in the study's animal imaging protocol, if applicable.
- 6.2.12 In the hot room, measure the radioligand's radioactivity left in the syringe using the dose calibrator. Record this post-injection reading on the Scan Log Sheet.

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## 7. References

SAIL-PET-SOP-01: Radio-ligand handling

SAIL-PET-SOP-03: Anesthesia Induction and Maintenance

## 8. Appendices

None

