

Standard Operating Procedure
Use of Martinos Imaging Suites for Animal Research Protocols

PURPOSE:

It is the policy of the MGH (Massachusetts General Hospital) Institutional Animal Care and Use Committee (IACUC) that the use of research laboratory animals in MGH imaging suites for IACUC-approved protocols will be performed according to this procedure and in alignment with MGH Infection Control and Environmental Health and Safety requirements for employee and patient safety.

SCOPE:

This Standard Operating Procedure applies to all MGH personnel who perform studies with animals in MGH imaging suites that are designed for human and/or animal use. The procedure applies to employees, contractors, students and visitors that may be involved in imaging studies with animals.

RESPONSIBILITIES:

- I. **Principal Investigator as listed on the MGH IACUC Protocol:** Responsible for enforcing and monitoring compliance with this policy, and providing all employees and contractors under his/her direction with appropriate training on this policy.
- II. **Director, MGH Martinos Center:** Responsible for enforcing and monitoring compliance with this policy in Martinos Center imaging locations, and providing all employees and contractors under his/her direction with appropriate training on this policy.
- III. **Employees/Contractors, MGH Martinos Center:** Responsible for following all requirements of this policy, and reporting any deviations from this procedure to the Director, MGH Martinos Center and the Principal Investigator.
- IV. **MGH Research Employees/Contractors Listed on the IACUC Protocol:** Responsible for following all requirements of this policy, and reporting any deviations from this procedure to the Director, MGH Martinos Center and the Principal Investigator.
- V. **Students and Visitors:** Responsible for following all requirements of this policy and all instructions provided by MGH host.

PROCEDURE:

I. Scheduling of Imaging Suite

- A. The imaging suite must be reserved in advance of the scheduled imaging procedure by the Principal Investigator or his/her designee.
- B. Imaging of animals in imaging suites that are in hospital clinical areas for human patient use should be preferentially scheduled at the end of the day and should not conflict or otherwise interfere with imaging of human subjects.

II. Animal Preparation and Transport to Imaging Suite

- A. Animal preparation, including hair clipping, catheter placement, anesthesia induction, and intubation are to be performed by investigators in vivarium areas prior to transport to the imaging suite whenever possible. For rodents/small animals preparation may be done in approved imaging procedure and surgical areas outside of the vivarium. (See further details outlined in letter B. below)
 - a. Personnel will bring their own medical supplies that may be necessary for animal restraint and the imaging procedure; no such supplies will be provided in the imaging suite.
 - b. Personnel will monitor and document animal anesthesia and recovery in accordance with IACUC policies and specific requirements in the applicable protocol. If the investigator prefers veterinary technical assistance for these tasks or is interested in receiving training, contact MGH Center for Comparative Medicine.
- B. For MR imaging in the Martinos Center (CNY, Building 149), animals to be imaged in Bay 1 (Room 11B), Bay 2 (Room 116A), Bay 3 (Room 122A), the 2.0 T Lab in Room 124, or the 4.7 T Lab adjacent to Room 134 are to be prepped and maintained in Room 137 when not undergoing an imaging session. Similarly, animals to be imaged in Bay 4 (Room 1075) or Bay 5 (Room 1076) are to be prepped and maintained in Room 1067 when not being imaged. Animals being imaged in the MicroPET area may be prepped on the approved counter space within room 1.306. For Bay 8 (CNY, Building 75) animals must be prepped in the approved procedure room by the 15T. This requirement includes pre-imaging holding and anesthetization as well as post-imaging holding and recovery from anesthesia. These procedures cannot be performed within the designated patient-care areas. Exceptions to this departmental regulation must be discussed and approved by the imaging facility manager at the time of the initial pre-imaging meeting.
- C. For PET/MR imaging of animals in Bay 6 or 7 (CNY, Building 149 West), all animals must be prepped in the vivarium procedure rooms relative to that species, prior to arrival. This includes any animals being transported over from the main campus to CNY, Building 149.

All pre- and/or post-imaging holding in this Bay area requires animals to be kept within their respective transport cages at all times while not being imaged.

- D. Animals must be transported in secure, covered caging from animal holding areas to the imaging suite.
- E. At no times are animals permitted in patient staging areas adjacent to imaging rooms or in hallways unless in transit to or from the imaging suite.
- F. Service elevators are to be used if present in the facility. If a service elevator is not present or available for use, passenger elevators may be used but must not include passengers not affiliated with the animal imaging study.
- G. All personnel must refrain from discussing the project in patient areas.
- H. Once the animal is inside the imaging suite, close all doors to the suite.

III. Imaging Suite Preparation

- A. Confirm that waste containers for biohazard waste, sharps and soiled linen are available in the imaging area.
- B. Confirm that Virex 256® Quaternary Disinfectant (“Virex”) is readily available and not expired. If Virex is not available, contact Environmental Services (CNY general phone number 6-5490).
- C. Confirm that soap and paper towels are available for hand washing in near vicinity of the imaging suite.
- D. Confirm that the appropriate Personal Protective Equipment (PPE) is available for the species you are handling.
 - a. All surgical and prep procedures for small animals during imaging must follow modified aseptic technique and the Rodent Surgical Survival policies outlined by the MGH IACUC website. <http://is.partners.org/aniweb/surgproc.htm> This will consist at minimum of a lab coat or gown, disposable gloves and face mask.
 - b. Large animal surgical and prep procedures should be performed in the appropriate animal facility prior to imaging, where PPE will be determined by the area, species, and type of procedure. During imaging, at minimum a lab coat or gown, gloves, and face mask will be worn by those personnel approved and handling the animal.
 - c. PPE requirements for all imaging procedures involving Non-Human Primates must always include a fluid-resistant gown or coat, 2 pairs of gloves, face mask and shield, hair bonnet, and shoe covers.
- E. Confirm that the imaging suite contains a bite/scratch/needle stick kit and instructions for use and for the immediate notification of MGH Occupational Health staff should an NHP exposure occur.

- F. Confirm that a contact list is on hand or posted in the event of an emergency (veterinary or human).
- G. Cover all areas of equipment and the imaging suite that could be potentially contaminated with body fluids and secretions from the animals. Use impervious barrier materials such as fluid-resistant drapes or Chux. This includes but is not limited to the imaging apparatus and floors where animals may be located after being removed from a cage and prior to being placed in the imaging apparatus.
- H. Remove or cover with impervious barrier materials all equipment on the imaging table that is not required for the study.
- I. Drape the table with moisture-proof plastic sheeting and line with disposable absorbent pads. It is ideal to provide an imaging system-compatible surface over the regular table where the animal can be placed during the examination.
- J. Confirm that the necessary medical equipment and devices (e.g. surgical instruments, scopes, and vital parameter monitoring) is available and set up, ready for use. Under no circumstances can equipment and devices used for animals be used on a human patient, unless with prior approval, and assurance that the devices can be safely decontaminated between uses.

IV. Imaging Suite Use

- A. No food or drink is allowed in the imaging suite.
- B. All personnel in the imaging suite must put on PPE. The only exception is personnel that are located exclusively in the control room. When there is no separation between the control room and imaging room within the suite, any protocol staff not associated with animal handling must exit the suite when the animal is brought in/out of its transport cage and imaging room, or don appropriate PPE if Occ Health clearance is approved.
- C. Remove the animal from its cage and position in the imaging apparatus. Any door between the imaging room and control room must be closed at this time, and only those personnel who are approved to handle the animal and the equipment should be in the imaging room itself.
- D. A sign must be hung on the outer most door to the area or imaging suite indicating that there is a research study in progress, and "Do Not Enter" to deter any non-approved personnel from entering.
- E. If sharps are used to deliver anesthetics, dyes, drugs or other materials prior to imaging, properly dispose of all sharps in the sharps container.
- F. Confirm that there are no metallic objects in the imaging suite if the suite is a magnetic resonance facility. Remove any metallic objects if necessary.
- G. Commence the imaging protocol.

- H. Gloves must be changed (and hand hygiene performed in between) before touching control panels, video equipment, telephones, doorknobs, or other devices.
- I. All waste that is generated is considered either biohazard or sharps waste. At no time will regular trash containers be utilized.
- J. Only personnel that are listed on the MGH IACUC approved Protocol (either individually or as an approved member of the Martinos research group) for the study are allowed in or around the imaging suite during the procedure. Visitors are not allowed.
- K. The front page of the most current version of the MGH IACUC approved protocol, listing all staff and personnel must be printed and posted outside the control room throughout each study. If any study staff have been recently added via an amendment, and this amendment has been approved but staff are not yet reflected on this front page, then the email from the IACUC indicating the name(s) of the newly approved personnel must be printed out and included with the front page of the most current version of the MGH IACUC approved protocol as stated above.

V. Imaging Suite Decontamination

- A. The imaging suite must be immediately cleaned and decontaminated upon the completion of animal studies:
 - a. Return the animal to the cage.
 - b. Remove all disposable and non-disposable coverings. Place the disposable coverings in the biohazard waste container. Place the non-disposable coverings in the soiled linen container.
 - c. Carefully check the equipment and surrounding areas for any sharps such as needles and syringes. Dispose of in the sharps container.
 - d. Thoroughly apply Virex to all surfaces and equipment that may have been in contact with the animals. This includes tables, equipment, surface coils, positioning devices, and floors. Apply a sufficient amount of disinfectant so that surface is wet. Use disposable wipes (e.g., WypAll®) and friction to clean and spread disinfectant over surfaces. Wipe all accessible areas. Allow at least ten minutes of contact time before wiping off (timers are available in the suites). Dispose of disposable wipes in the biohazard waste.
 - e. If equipment and surfaces are heavily soiled first use Virex to clean and remove soil (it is a detergent disinfectant product). Follow the initial cleaning with a second application of Virex for disinfection. Apply a sufficient amount of Virex so surfaces are wet with disinfectant. Wipe all accessible areas. Allow at least ten minutes of contact time before wiping off (timers are available in the suites). Dispose of disposable wipes in the biohazard waste.

- B. Remove all PPE and discard in the biohazard waste container. If non-disposable, decontaminate with Virex.
- C. If the next imaging session will involve a human subject, call Environmental Services (CNY general phone number 6-5490) and request that they remove the biohazard and sharps waste containers and the soiled linen container from the imaging suite first.
- D. If any imaging procedures are terminal, carcasses must be properly packaged, transported, and disposed of by the PI or his/her designee. At CNY, carcasses should be disposed of in the 8th floor animal facility in Building 149. At the MGH Boston Campus, carcasses should be disposed of in the Thier basement / 1st floor animal facility.
- E. Wash hands with soap and water followed by disinfection with alcohol-based hand sanitizer.
- F. After an animal imaging study and decontamination efforts are completed and waste has been removed by Housekeeping, the imaging suite must not be used for human subjects until a period of at least 60 minutes has elapsed after the animals have been removed.
 - a. Post a sign on the door to the imaging suite noting the date/time that the suite may be returned to service for human subjects. (To be provided ready for use in each bay by the Martinos center staff) Include the Principal Investigator's name and phone number. Remove the sign once the time period has elapsed.

VI. Animal Transport From Imaging Suite

- A. Animals must be transported in secure, covered caging from the imaging suite to animal holding areas.
- B. At no times are animals permitted in patient staging areas adjacent to imaging rooms or in hallways unless in transit to or from the imaging suite.
- C. Service elevators are to be used if present in the facility. If a service elevator is not present or available for use, passenger elevators may be used but must not include passengers not affiliated with the animal imaging study.
- D. All personnel must refrain from discussing the project in patient areas.