



**Brigham and Women's Hospital
MRI Animal Research Policy**

All processes that grant researcher access to BWH MRI facility must be met prior to Animal research application. Violations to these Policies and Procedures will result in a review of the incident or event with the MRI Safety Committee, the Principal Investigator and the responsible individual. Appropriate penalties will be administered.

Additionally, the following requirements must be met prior to scheduling Animal research at any BWH MRI facility:

- I. Animal protocol approved by Harvard Medical School Standing Committee on Animals (HMA IACUC): <http://www.hms.harvard.edu/orsp/animal.html>
- II. IACUC Training: Humane Care and Use of Laboratory Animals in Research and Teaching – Required Every Three Years (must be completed before being added to animal protocol)
http://bwhbri.partners.org/Research_Compliance/Documents/Animal%20Research/animaltraining.aspx
- III. Personnel must be listed on animal protocol approved by the Harvard Medical School Standing Committee on Animals (HMA IACUC)

Follow all General Research Guidelines of MRI Research Policy

User Certification

- I. To begin this certification process outlined below, contact the Research Coordinator
- II. All researchers who will be in the scanning area must complete the following:
 - a. Occupational Health Clearance
 - i. TB Test – Twice per year if working with non-human primates
 - ii. Animal Exposure Surveillance Program Screening Form (completed form must be submitted to Occupational Health ONCE PER YEAR)
 - b. HealthStream Online Training Modules
 - i. Completion of “Research Lab Safety General Training Quiz” (1X PER YEAR)
 - ii. Completion of HIPAA Quiz (1X PER YEAR)
 - c. MRI Safety Training; Contact MRI Safety Officer
 - i. 1st training IN PERSON with MRI Safety Officer
 - ii. Annual refresher training on HealthStream
 - iii. Site orientation, and Policy and Infection Control Training for each intended magnet bay (Contact: Aida Faria for the 3T clinical scanners and Tehya Johnson for the 7T Bruker Preclinical scanner)
 - d. Completion of “Working with BL2-N Infectious Agents in Animals” (AALAS Learning Library) required for access to SAIL facility and Bay 4 (Bruker 7T MRI)
- III. Once the training is completed, Research Coordinator will provide the researcher with a card reader badge which will allow them 24/7 access to the Center. If a researcher plans to house at the SAIL satellite animal facility, they must also attend an orientation to the facility with the animal facility manager (contact below).

General Guidelines

- I. Follow all BWH BWMRC (Brigham and Women’s MRI Research Center) -221 Longwood Ave. Infection Control Policies
<http://www.bwhpikenotes.org/GeneralClinicalResources/InfectionControl/InfectionControl.asp>
- II. Personnel must be listed on animal protocol approved by the Harvard Medical School Standing Committee on Animals
<http://www.hms.harvard.edu/orsp/animal.html>

Animal Research Scheduling

- I. Contact the Research Coordinator to schedule animal studies
- II. Submit copy of IACUC-approved protocol to Research Coordinator
- III. Animal scans are permitted anytime during day or night, seven days a week, with the following qualifications:

- a. Bay 4 (Bruker 7T animal MRI) is a stand alone small animal holding and imaging research sub-suite inside the BWMRC, therefore, animal imaging will be allowed at all times pending pre-approval.
 - b. Bay 3 (Siemens Skyra 3T MRI) is a stand alone sub-suite inside the BWMRC, therefore, animal imaging will be allowed at all times pending pre-approval.
 - c. Bay 1 (GE 1.5T MRI) and Bay 2 (GE 3T MRI): use a shared MRI clinical support area (gowned waiting, patient prep, crash area, etc), therefore, animal imaging in either Bay 1 or Bay 2 will require closure of remaining bay for clinical (human) and research (human/animal) for the entire time of imaging plus 90 minute (min) turnover time (described in item IV below). Requires pre-approval.
- IV. The scan area must not be utilized for human patients/research subjects until at least 90 minutes (1.5 hours) have passed from the time the animal leaves the MRI suite. Refer to EH+E “Modeling and Review of Ventilation Characteristics of BWH MRI Suite at 221 Longwood Ave” report dated 4/16/12 for more information. Purpose of 90 minute turnover time is broken down to a 60 minute ‘purge cycle’ that performs a high air turnover and exhausts 100% of the air in the room out of the building followed by a 30 minute cycle to stabilize room temperature between 72 and 76 degrees. Purge cycle controls: staff manually press clearly marked button at each control counter, a timer installed as part of the building automation system will control the full 90 min cycle, no other work as part of the purge cycle needs to be performed by staff.
- V. PI must notify 221 Longwood via telephone prior to animal arriving onsite
- VI. Research Coordinator must be notified of cancellations at least one week prior to scheduled time if possible

Animal Compliance

- I. Animal must not be in quarantine
- II. Animal must be free of clinical signs of common zoonotic diseases (e.g. salmonellosis)
- III. Non-human primates must be serologically negative for *Herpesvirus simiae*

Animal Transportation

- I. All animals must be accompanied at all times by research staff from the institution of origin or a BWH designee.
- II. Animals transported to, from, and within BWH buildings must be in vehicles and enclosures that comply with federal laws and regulations and the Guide.
- III. Animal transport procedures must be pre-approved by HCCM veterinary staff
 - a. HCCM will transport animals if coming from a HCCM barrier facility
 - b. HCCM will transport animals if there is elevated risk of shedding virus/infection, to be determined by HCCM veterinary staff
- IV. Animals must be transported in HEPA filtered, disinfected transporter, and covered in order to eliminate all sensory contact with patients (animals cannot be seen, heard, or smelled)

- V. During NON-CLINICAL hours, animals may be transported to 221 Longwood at 221 Longwood loading dock, through MCP, or by entrance at Louis Pasteur Ave.
- VI. During CLINICAL hours, large animals may be transported through MCP to enter Bay 3 (Siemens 3T Skyra) through side door to avoid entering main patient corridor. Small animals to be scanned in Bay 4 (Bruker 7T) may be transported directly to SAIL suite.
- VII. Preparations must be done before the animal is brought into the MRI suite- 221 Longwood Area

Transport to MCP facility (done either on day of or day before MRI scan)

- I. Schedule a pick-up time with HCCM driver. Try to give him at least a couple days notice if feasible.
- II. Make sure MRI equipment box is stocked with appropriate equipment. Check portable ventilator: oxygen, sodasorb.
- III. Day of transport: Weigh animal in Thorn 16, then load animal(s) into transport cart. Place the appropriate animal records and cage cards into the MRI chart folder. You need to take this folder with you. Mark the animal(s) off of the census list.
- IV. After animals are loaded into the transport cart, confirm arrival of the HCCM truck and then proceed down the Thorn elevators to the 1st floor back door. Load the transport cart, ventilator, and gray cart onto the truck and secure in place.
- V. At 221 Longwood: push the transport cart and equipment to MCP animal facility. Unload animal(s) into cages. Place cage cards on front of cages and leave record folder in animal room. Mark the animals in on the census list. Fill up water buckets and food trays as needed.

Day of MRI scan

- I. Prep MRI scanner and scanner suite per facility protocol (i.e., cover scanner bed, cover storage units, cover counters, etc.)
- II. Sedate animal as per protocol (i.e., Telazol, Isoflurane), load onto cart, and intubate. Cover animal with drape and/or gowns. Document appropriately in animal record.
- III. Transport animal to MRI suite.
- IV. Load animal onto scanner, perform scan. Change oxygen tanks during scan as needed.
- V. After scan is done, load animal back onto cart and transport back to MCP facility. Extubate once the animal has woken up and is breathing spontaneously. Place the animal back into cage.
- VI. Document appropriately in animal record.
- VII. All non sharp disposables are placed in a leak-tight plastic bag, and placed in biohazard waste back in the animal facility.
- VIII. All sharps are placed in a sharps container brought along for this purpose, and removed from the MRI suite.
- IX. Surfaces in contact with the animal are cleaned using germicidal Asepti II wipes.
- X. Work surfaces shall be cleaned from cleanest to dirtiest, and from top to bottom.

Transport to Thorn (usually done day after MRI scan)

- I. Schedule a pick-up time with HCCM driver.
- II. Load animal(s) into transport cart. Place the appropriate animal records and cage cards into the MRI chart folder. You need to take this folder with you. Mark the animal(s) off of the census list.
- III. After animals are loaded into the transport cart, confirm arrival of the HCCM truck and then proceed to the loading dock at 221 Longwood. Load the transport cart, ventilator, and gray cart onto the truck and secure in place. You may leave the ventilator at MCP if you will be scanning again in the near future.

At Thorn: enter Thorn via 1st floor rear doors and transport up to Thorn 16. Unload animal(s) into appropriate cages. Place cage cards back on cage fronts, and place records back into appropriate folders. Mark animal back in on census list

Care of the Environment

- I. Equipment not required for the study must be removed or covered with non-pervious drapes before the animal is brought into the examination room (e.g., cover power injector with blue linen bag).
- II. Place absorptive padding under animals (e.g., chucks, diaper)
- III. Areas that may come in contact with animal blood, body fluids and dander must also be draped
- IV. The MR control area doors must be kept closed while animals are in the room; no one other than personnel actively involved in the research project will be allowed in the scan room
- V. The area should not be utilized for human patients until at least 90 minutes have passed from the time the animal leaves the MRI suite. The log will be signed by the researcher documenting the time the animal leaves the area.
- VI. If a BL-2 animal is being scanned, the MRI suite will be designated BL-2 for the entire duration of the study and clean-up period. Investigators must display temporary signage indicating BL-2 level. BL-2 cart containing necessary PPE will be left outside MRI suite so investigators may don appropriate attire before entering.
- VII. Bay 1 and 2 (currently housing a GE 1.5 T MRI and GE 3T MRI): Human scanning may not take place in Bay 1 while animal scanning is taking place in Bay 2 and visa-versa due to shared airspace. Both bays must wait 90 minutes for human scanning after animal scanning occurred in either bay.

User Requirements

- I. PPE: If user must handle the animal at any time, protective clothing will be worn as required. Gloves must be changed before touching control panels, video equipment, telephones, doorknobs, or other devices.
 - a. For BL-1 Animals: gowns or scrubs, gloves, masks, and shoe covers

- b. For BL-2 Animals or designated BL-2 Areas: disposable solid front gowns, double gloves (with a thicker nitrile glove) hair cover, shoe cover, and face mask
- II. User handling the animals or sample material must wash their hands prior to leaving the MRI suite
- III. The log book will be signed by the researcher documenting the time the animal enters and leaves the area.

Clean up

- I. Universal clean-up policy below must be followed after every animal study in all BWMRC MRI suites
 - a. All equipment and surfaces that come in contact with animal should be wiped down with BWH approved antiseptic wipe, including inside of magnet bore.
 - b. Surface must remain visibly wet for entire amount of time specified by antiseptic wipe used (usually 2-5 minutes). Additional wipes may be used if necessary to ensure surface is wet for entire contact time.
 - c. Floor should be mopped if necessary (e.g. medical waste splashes on floor).
 - d. Sharps, soiled linens, drapes, medical supplies, etc. should be properly disposed of in SAIL soiled linen area (NOT IN BL-2 HOUSING/PREP AREA).
 - e. Supplies and Equipment Needed for Post-study clean-up:
 - i. Detergent cleaning (e.g. Buell, Organisol, Klenszyme)
 - ii. Disinfectant solution (e.g. Bleach)
 - iii. Antiseptic wipes (BWH approved)
 - iv. Protective Wear
- II. The situations described below require additional clean-up:
 - a. A human patient or research subject scan immediately follows an animal scan: The MRI suite must be closed for 90 minutes after the animal has left before a human may be scanned.
 - b. In order to decrease the chances of cross-contamination between colonies, whenever an animal from an outside program (NOT BWH, HMS, or RPC) is scanned either prior to or following an HCCM animal: The MRI suite must be closed for 90 minutes between scanning animals from HCCM and outside colonies.
 - c. Animal being scanned has non-intact skin: SAIL staff may require equipment sterilization in the case of pathogenic tissue.
 - d. BL-2 Animals: All BL-2 protocols must be followed, including proper disposal of PPE in biowaste container, appropriate and sufficient cleaning regimen, and removal of temporary BL-2 sign.

Inspect scanner room and console area before you leave using the Animal Policy Self-Checklist:

Animal Policy Self-Check List

- Animal removed

- Animal hair and body fluids cleaned
- Wipe table top, MRI coil, bore and other surfaces potentially in contact with animal using a cleaning solution
- House keeping called to empty trash (if necessary)
- All equipment used in research removed from area
- Uncover clinical equipment
- Pull shade back up
- Sign logbook (room cleaned, QA scan performed)
- Take with you when you leave:
 - Medical waste in biohazard container
 - Sharps in sharps container
 - Linens in linen bag

Contact List

Medical Emergency, 221 Longwood.....	9-911
Security.....	26565
Occupational Health.....	28501
Animal Exposure Surveillance Program Coordinator.....	26258

Clare Tempany, M.D. <i>Vice Chairman of Radiology Research</i>	(617) 732-8772 ctempanyafdhal@partners.org
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Sharon Peled, Ph.D. <i>7T Bruker MRI Manager</i>	(617) 525-6528 speled@partners.org
Tehya Johnson <i>Research Coordinator</i>	(617) 525-9991 tjohnson28@partners.org
Gilberto Ramirez <i>SAIL Satellite Animal Facility Manager</i>	(617) 432-1609 Gilberto_ramirez@hms.harvard.edu

To contact User Community: signa@bwh.harvard.edu
 To contact SAIL Community: sail@bwh.harvard.edu

Online Resources

BWH Infection Control Policies:	http://www.bwhpikenotes.org/GeneralClinicalResources/InfectionControl/InfectionControl.asp
HMS Standing Committee on Animals:	http://www.hms.harvard.edu/orsp/animal.html
BWH Research Compliance:	http://bwhbri.partners.org/Research_Compliance/Documents/Animal%20Research/animalresearchlanding.aspx

REPEAT for Each New Imaging Procedure
 Each new animal imaging procedure (protocol, amendment, etc.) at the MRI at 221 Longwood must be reviewed and approved by the IACUC AND Dr. Art Lage prior to initiating the procedure even if you are already certified to use the MRI. Approval must be on file with Radiology Administration.

