



MRISC STANDARD OPERATING PROCEDURES

SOP Number-version: MRI-2.1	
SOP Title: Magnetic Resonance Image Scanner Operator Training	
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	Effective Date: 28-Sept-2020

1.0 Purpose / Scope:

- 1.1 The purpose of MRI operator training is to ensure that Principal Investigators and study staff personnel acquire the necessary experience needed to run their respective scanning protocols including the use of auxiliary equipment such as water bath, in vivo physiological monitoring and anesthesia machines.
- 1.2 The Scope of this procedure covers studies conducted by the Principal Investigator on the Siemens 3T PRISMA or Bruker 7T ClinScan small animal MR imager at the UK MRISC.
- 1.3 MRI scanner operator training and certification is linked to and limited to a specific investigator protocol. Retraining and additional certification is required for any new animal scanning protocols.
- 1.4 For more specific and detailed information, see SOP MRI-3.1 on Study Conduct and Equipment Operation.

2.0 Definitions: (if applicable)

- 2.1 Magnetic Environment: The area where the magnetic field is greater than 5 Gauss resulting in the potential for objects to become missiles or projectiles as they are attracted into the magnetic field of the scanner. Individuals who may have cardiac pacemakers or other implants and devices may be at risk to enter the magnetic environment. The magnetic field is always present and is three dimensional around the scanner.
- 2.2 MRI Safety Training: The required procedure that must be completed prior to working within the magnetic environment.

- 2.3 Safety Screening:** The process of inquiring about the safety of individuals, including research subjects prior to entering the magnetic environment. Screening also applies to checking equipment for safety prior to being used in the magnet room.

For additional definitions, see also the Glossary of Terms located on the GRP Access Server \\prdlcancifs01.mc.uky.edu\Dept\Neuroscience\GRP or IP address [\\172.25.104.37\grp\\$](http://172.25.104.37\grp$).

3.0 Specialized Materials & Equipment: (if applicable)

- 3.1 Bruker 7T ClinScan small animal MRI, syngo MR B15
- 3.2 Siemens 3T PRISMA
- 3.3 Bruker CryoProbe
- 3.4 Isoflurane and Desflurane anesthesia equipment
- 3.5 Water bath
- 3.6 SA Instruments physiological monitoring equipment
- 3.7 Disinfectant, e.g., HUSKY N/D germicidal Cleaner or equivalent

4.0 Procedures:

4.1 Operator Training

- 4.1.1 Individuals operating MRI scanners for research must complete the required MRI Operator Training and certification process prior to conducting independent scanning involving animals.
- 4.1.2 Any training completed is documented at the time of completion on F-MRI-2 Attachment 1 (A1), MRI Operator Training verification form.
- 4.1.3 Individuals must successfully complete the Physical Principles of MRI lecture series offered by the MRISC. Completion is documented by the MRI technologist on F-MRI-2 Attachment 1 (A1), MRI Operator Training verification form.
- 4.1.4 MRI operator training is specific to the research protocol(s) of the Principal Investigator.
- 4.1.5 MRI operators are required to read all applicable MRISC SOPs, inclusive of this one. Having read and understood, the applicable

SOPs are documented by MRISC staff on F-MRI-2 Attachment 2 (A2), MRI SOP Training Form.

4.1.6 Individuals must initially observe multiple sessions of the entire study protocol being carried out either by previously certified lab personnel or by MRISC staff. Training activities are documented by training staff on F-MRI-2 Attachment 1 (A1), MRI Operator Training verification form.

4.1.3.1 Use of the anesthesia induction box.

4.1.3.2 Water bath set-up and monitoring.

4.1.3.3 Set-up of the SA Instruments physiological monitoring equipment and associated software for recordings of body temperature, breathing and heart rates. SPO2 and/or ECG monitoring may be required as well.

4.1.3.4 Set-up of the particular anesthesia machine (isoflurane or desflurane) used during scanning.

4.1.3.5 Set-up of the required RF coil(s) and positioning of the animal in the scanner.

4.1.3.6 Some mouse brain study protocols may require the use of the highly specialized CryoProbe.

4.1.3.7 Set-up and running of the protocol-specific image acquisition sequences on the Syngo scanning console of the 7T Bruker ClinScan MRI.

4.1.3.8 Recording of subject information and vital signs during scanning (see SOP MRI-4, Good Documentation Practices, and form F-MRI-4 Attachment 1 (A1), 7T MRI Scanner Use and Data Disposition)

4.1.3.9 Break down and cleaning of all procedure components.

4.1.4 Individuals subsequently carry out all steps of the particular study protocol themselves under the supervision of either certified lab personnel or MRISC staff.

4.1.5 For final independent scanning certification, MRISC staff will observe the individual performing all steps of the specific study protocol. Authorization is documented by the training staff on F-MRI-2 Attachment 1 (A1), MRI Operator Training verification form.

5.0 Attachments: (if applicable)

- 5.1 F-MRI-2 Attachment 1 (A1), MRI Operator Training verification form.
- 5.2 F-MRI-2 Attachment 2 (A2), MRI SOP Training Form.

6.0 References: (if applicable)

- 6.1 ISMRM & SMRT MR Safety Resources <https://www.ismrm.org/mr-safety-links/>
- 6.2 FONAR – MRI Glossary <http://www.fonar.com/glossary.htm>

7.0 Record Retention:

- 7.1 The signed and dated MRI operator training verification forms are kept by the MRISC Administrator.

8.0 Change History:

Rev.	Effective Date	Summary of Changes
1	31-MAY-2020	New procedure



**ATTACHMENT 1
APPROVAL FOR INDEPENDENT RESEARCH SCANNING**

Name of Trainee: _____

Title / Position and e-mail: _____

Research Project(s): _____

Principal Investigator(s): _____

Name

PI Signature

Date

IRB / IACUC protocol number: _____ Expiration Date: _____

To be completed by the MRISC:

Protocol on file at the MRISC?

Yes _____ No _____

Successful completion of the MRI safety and operation training sessions?

Yes _____ No _____

This individual has successfully met all requirements for scanning on the:

Siemens 3T PRISMA _____

Bruker 7T ClinScan _____

Trainer

Date: _____

Director

Date: _____



**ATTACHMENT 2
SOP TRAINING FORM**

Trainee Name: _____

SOP Number	SOP Title

I certify by my signature below that I have read and understand the above referenced SOP(s).

Trainee Signature: _____ Date: _____