



3T/7T MRI FACILITY

SOP Number:	130.03
Title	MRI Personnel Training

Revision Chronology		
Version Number	Date	Changes
130.01	28 July 2008	New
130.02	22 January 2013	SOP renamed; regulations, restrictions, and categories of MRI Personnel updated
130.03	27 October 2015	Review

Associate Director Signature: _____

Date: _____

ROBARTS RESEARCH INSTITUTE
CENTRE FOR FUNCTIONAL AND METABOLIC MAPPING:
3T/7T MRI FACILITY

Standard Operating Procedure #130.03

MRI Personnel Training

1. Introduction

- 1.1 Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths presents unique hazards to both research subjects and individuals working within and around the MRI system. Consequently, the potential for serious personal injury is present due to the sheer magnitude and strength of the static magnetic field along with the immense flexibility of the research system and associated peripheral hardware.
- 1.2 The static magnetic field in the 3T/7T MRI Facility is always present. It is essential that everyone entering the facility is aware of the presence of the magnetic field, and that dangerous and potentially lethal levels of electricity are used by both the 3T and 7T MRI systems.
- 1.3 Due to the inherent hazards associated with the static magnetic field, access to the 3T/7T MRI Facility is restricted to ensure the safety of all patients, subjects, visitors, and staff. The 3T/7T MRI Facility is conceptually divided into four Zones of increasing level of potential risk and access restriction, see SOP#100a: "MRI Facility Safety Zones".
- 1.4 Individuals requiring regular access to the 3T/7T MRI Facility and who meet the requirements set out by the facility may be granted access as Research Personnel, Level 1 MRI Personnel, or Level 2 MRI Personnel. Eligibility, requirements, and restrictions on these individuals are outlined in this SOP.

2. Level 2 MRI Personnel

- 2.1 Level 2 MRI Personnel may include, but are not limited to, the Facility Director, Associate Director, MRI Technologists, and MRI Operators. Level 2 MRI Personnel are those who require both Security Access to Zone III of the 3T/7T MRI Facility, and unsupervised access to Zone IV (MRI magnet rooms).
- 2.2 All Level 2 MRI Personnel require and must apply for Security Access as set outlined in SOP#100b: "MRI Facility Access Approval Policy".
- 2.3 Level 2 MRI Personnel are required to read and sign off on all SOP's as indicated on the "Signature Sheet: Level 2 MRI Personnel" (see Appendix 2) declaring that they have read, understand, and plan to follow all of the guidelines set in place by the SOP's. Upon completion, the Signature Sheet must be given to the Associate Director or the Senior MRI Technologist.
- 2.4 It is mandatory that all Level 2 MRI Personnel complete MRI Safety Training, a 3T/7T MRI Facility Safety and Orientation session, and review sessions as required. The content,

frequency, and extent of these sessions will be determined by facility staff.

2.4.1 Due to the potential safety hazards and inherent responsibility of Level 2 MRI Personnel, these individuals must complete more extensive training and education in all aspects of MRI safety and facility operation than Level 1 MRI Personnel.

2.4.2 MRI Safety Training will include:

2.4.2.1 Reading all relevant SOP's (see Appendix 2: "Signature Sheet: Level 2 MRI Personnel").

2.4.2.2 Viewing online safety videos:

<http://cfmm.robarts.ca/resources/safety-training/videos/>

2.4.2.3 Satisfactorily completing an online 3T/7T Safety Quiz:

<http://cfmm.robarts.ca/resources/safety-training/3t-7t-safety-quiz/>

2.4.2.4 On-site safety instruction.

2.4.3 3T/7T MRI Facility Safety and Orientation must occur prior to obtaining Security Access to the facility, and will consist of a review of MRI safety issues, emergency procedures, equipment handling and procedures, restrictions and responsibilities of Level 2 MRI Personnel, facility access restrictions, and other topics as determined by facility staff.

2.4.3.1 The "Safety Training Checklist: Level 2 MRI Personnel" (see Appendix 3) will be used as a general guideline during the orientation session. Upon completion of the session, both the facility staff member performing the training session and the trainee must sign off on this Checklist.

2.4.4 Review sessions may include, but are not limited to, refresher 3T/7T MRI Facility Safety and Orientation sessions, CPR/AED/First-Aid re-certification, emergency procedure / Code Blue reviews, and orientation to new facility policies, procedures, or safety protocols. Level 2 MRI Personnel will be notified in advance of any review sessions they are required to attend.

2.5 Both the 3T and 7T MRI systems are certified Class II Medical Devices as determined through the Health Protection Programme (HPP) of the Federal Government. The HPP has deemed it the responsibility of the facility to ensure that only authorized personnel operate the 3T and 7T MRI scanners.

2.5.1 Authorized 3T and 7T MRI operators will include only individuals who have completed the education, facility orientation, and training as outlined in this SOP.

2.5.1.1 Individuals who complete this training, who have also completed a formal Magnetic Resonance education program at an academic institution and who have passed the Canadian Association of Medical Radiation Technologists (CAMRT) certification exam in Magnetic Resonance (i.e. hold RTMR designation), are herein referred to as MRI Technologists.

2.5.1.2 All other individuals who have completed this training but do not hold RTMR designation, are herein referred to as MRI Operators.

2.5.2 All operators of the 3T and 7T MRI scanners must be trained as Level 2 MRI Personnel, plus complete additional training on the system and its components to ensure the wellbeing of patients, volunteers, and staff, as well as the MRI system itself.

- 2.5.3 Training for MRI Technologists and Operators will be held onsite with the extent determined by facility staff.
 - 2.5.4 Training may include, but is not limited to: orientation to and instruction on the MRI system, operating system, and software; facility hardware orientation and training; peripheral equipment training; data transfer protocol instruction; quality assurance training; shadowing an MRI Technologist or Operator; and performing supervised MRI scanning. The extent and duration of training will be on an individual basis as determined by facility staff.
 - 2.5.5 All relevant documentation and information pertaining to operator status will be kept with the Facility Manager in a secured file cabinet and held in strict confidence.
- 2.6 Level 2 MRI Personnel may bring visitors into Zone III of the 3T/7T MRI Facility as per the regulations set in SOP#100b: "MRI Facility Access Approval Policy" and SOP#110: "MRI Facility Visitor Approval Policy", or may be present while others host visitors. It is the responsibility of all Level 2 MRI Personnel present to supervise visitors at all times and ensure that they do not cross the 5 Gauss line in Zone III or enter Zone IV (magnet room), unless prior safety screening and approval has been obtained as outlined in SOP#110: "MRI Facility Visitor Approval Policy".
- 2.7 Due to the responsibility incurred when operating the scanner, and the importance of the safety of the volunteer/patient and experimental support personnel, all Level 2 MRI Personnel are required to complete and maintain current CPR Level C, AED (Automated External Defibrillator), and Standard First-Aid certification.
- 2.7.1 Proof of current certification (i.e. a copy of the certification card signed by the instructor) must be provided to facility staff.
 - 2.7.2 Certification and re-certification courses will be arranged by facility staff and held onsite on an annual basis. Operators with CPR, AED, and/or First Aid certification expiring in any calendar year will be notified and expected to either attend the re-certification course or make alternate arrangements to obtain re-certification.

3. **Level 1 MRI Personnel**

- 3.1 Level 1 MRI Personnel may include, but are not limited to, investigators and associated research staff who utilize the 3T/7T MRI Facility on a regular basis, and who require Security Access to Zone III of the 3T/7T MRI Facility.
- 3.2 Individuals requiring Security Access to the 3T/7T MRI Facility as Level 1 MRI Personnel must apply for Security Access as set out in SOP#100b: "MRI Facility Access Approval Policy".
- 3.3 Level 1 MRI Personnel are required to read and sign off on all SOP's as indicated on the "Signature Sheet: Level 1 MRI Personnel" (see Appendix 4) declaring that they have read, understand, and plan to follow all of the guidelines set in place by the SOP's. Upon completion, the Signature Sheet must be given to the Associate Director or the Senior MRI Technologist.
- 3.4 It is mandatory that all Level 1 MRI Personnel complete MRI Safety Training, a 3T/7T MRI Facility Safety and Orientation session, and review sessions as required. The content,

frequency, and extent of these sessions will be determined by facility staff.

- 3.5 MRI Safety Training will include:
 - 3.5.1.1 Reading all relevant SOP's (see Appendix 4: "Signature Sheet: Level 1 MRI Personnel").
 - 3.5.1.2 Viewing online safety videos:
<http://cfmm.robarts.ca/resources/safety-training/videos/>
 - 3.5.1.3 Satisfactorily completing an online 3T/7T Safety Quiz:
<http://cfmm.robarts.ca/resources/safety-training/3t-7t-safety-quiz/>
 - 3.5.1.4 On-site safety instruction.
- 3.5.2 3T/7T MRI Facility Safety and Orientation must occur prior to obtaining Security Access to the facility, and will consist of a review of MRI safety issues, emergency procedures, restrictions and limitations on the Level 1 MRI Personnel's activities, facility access restrictions, and other topics as determined by facility staff.
 - 3.5.2.1 The "Safety Training Checklist: Level 1 MRI Personnel" (see Appendix 5) will be used as a general guideline during the orientation session. Upon completion of the session, both the facility staff member performing the training session and the trainee must sign off on this Checklist.
- 3.5.3 Review sessions may include, but are not limited to, refresher 3T/7T MRI Facility Safety and Orientation sessions, emergency procedure / Code Blue reviews, and orientation to new facility policies, procedures, or safety protocols. Level 1 MRI Personnel will be notified in advance of any review sessions they are required to attend.
- 3.6 Level 1 MRI Personnel have Security Access to Zone III of the 3T/7T MRI Facility, and are permitted to access Zone III as required. However, they are NOT permitted to enter Zone IV (MRI magnet room) without the permission and supervision of Level 2 MRI Personnel. All access to the magnet room is subject to the approval and discretion of Level 2 MRI Personnel.
- 3.7 Level 1 MRI Personnel may bring visitors into Zone III of the 3T/7T MRI Facility as per the regulations set in SOP#100b: "MRI Facility Access Approval Policy" and SOP#110: "MRI Facility Visitor Approval Policy". It is the responsibility of the Level 1 MRI Personnel to supervise their visitor(s) at all times and ensure that they do not cross the 5 Gauss line in Zone III or enter Zone IV (magnet room) at any time.

4. **Research Personnel**

- 4.1 Research Personnel may include, but are not limited to, researchers, staff, students, and other individuals associated with investigators who utilize the 3T/7T MRI Facility, and whose presence is necessary for the successful execution and completion of the research project.
- 4.2 Research Personnel will NOT be granted Security Access to the 3T/7T MRI Facility.
- 4.3 Research Personnel are required to read and sign off on all SOP's as indicated on the "Signature Sheet: Research Personnel" (see Appendix 6) declaring that they have read, understand, and plan to follow all of the guidelines set in place by the SOP's. Upon completion, the Signature Sheet must be given to the Associate Director or the Senior MRI

Technologist.

- 4.4 Research Personnel must complete MRI Safety Training and a 3T/7T MRI Facility Orientation session, the content and extent of which will be determined by Facility staff.
- 4.5 MRI Safety Training will include:
 - 4.5.1.1 Reading all relevant SOP's (see Appendix 6: "Signature Sheet: Research MRI Personnel").
 - 4.5.1.2 Viewing online safety videos:
<http://cfmm.robarts.ca/resources/safety-training/videos/>
 - 4.5.1.3 Satisfactorily completing an online 3T/7T Safety Quiz:
<http://cfmm.robarts.ca/resources/safety-training/3t-7t-safety-quiz/>
 - 4.5.1.4 On-site safety instruction.
- 4.5.2 3T/7T MRI Facility Orientation will occur either prior to or during the Research Personnel's first scan session at the Facility, and will consist of a review of MRI safety issues, restrictions and limitations on the Research Personnel's activities, and other topics as determined by facility staff.
 - 4.5.2.1 The "Safety Training Checklist: Research Personnel" (see Appendix 7) will be used as a general guideline during the orientation session. Upon completion of the session, both the facility staff member performing the training session and the trainee must sign off on this Checklist.
- 4.6 Research Personnel are NOT permitted to enter Zone IV (magnet room) without the permission and supervision of Level 2 MRI Personnel. All access to the magnet room is subject to the approval and discretion of authorized Level 2 MRI Personnel.
- 4.7 While in the 3T/7T MRI Facility, Research Personnel will remain under the supervision of Level 1 and/or Level 2 MRI Personnel at all times.

5. All Personnel

- 5.1 Granting 3T/7T MRI Facility access to anyone other than Level 2 MRI Personnel, Level 1 MRI Personnel, or Research Personnel status is at the discretion of facility staff.
- 5.2 Individuals who have safety contraindications, medical devices, or implants incompatible with the MR environment as outlined in SOP#120: "General Safety", will NOT be granted Level 2 MRI Personnel or Level 1 MRI Personnel status or allowed to enter Zone IV of the 3T/7T MRI Facility at any time.
- 5.3 All Personnel, including Level 2 MRI, Level 1 MRI, and Research Personnel, must complete and sign the facility's "Magnetic Resonance Environment Screening Questionnaire" (see Appendix 1) and have it reviewed, signed, and approved by authorized Level 2 MRI Personnel. Completed screening questionnaires will be kept on file with facility staff in a secure filing cabinet.
 - 5.3.1 New questionnaires do not need to be completed before each admittance. However, it is the responsibility of these individuals to inform Level 2 MRI Personnel (e.g. Associate Director or Senior MRI Technologist) of any change in status (e.g. if they undergo surgery, have an eye injury with metal, or obtain any metallic implants or devices). After any change in status, individuals must complete a new screening questionnaire and obtain approval from Level 2 MRI Personnel before entering Zone IV (magnet room).