



# Western

Centre for Functional  
and Metabolic Mapping

## 3T/7T MRI FACILITY

<b>SOP Number:</b>	<b>100.04b</b>
<b>Title</b>	<b>MRI Facility Access Approval Policy</b>

<b>Revision Chronology</b>		
<b>Version Number</b>	<b>Date</b>	<b>Changes</b>
<b>100.01</b>	<b>01 March 2010</b>	<b>Updated entry regulations</b>
<b>100.02b</b>	<b>22 January 2013</b>	<b>Separated SOP100 into SOPs 100a/100b; MR Zones and access restrictions defined</b>
<b>100.03b</b>	<b>27 Oct 2015</b>	<b>Review – minor updates</b>
<b>100.04b</b>	<b>28 May 2019</b>	<b>Review</b>

**Associate Director Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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

**Standard Operating Procedure #100.04b**

**MRI Facility Access Approval Policy**

**1. Introduction**

- 1.1 The 3T/7T MRI Facility is used primarily for *in-vivo* studies of human and animal structure and function. These studies include assessment of metabolism and physiology, cognitive function and vascular dynamics, not only in normal and research patient populations, but also in *in-vitro* and animal models using a variety of advanced nuclear magnetic resonance imaging and spectroscopy techniques. The 3T/7T Facility represents a unique national resource for state-of-the-art evaluation of structure and functional activity using a variety of MRI and MRS techniques in a research setting. The facility resources are available to peer-reviewed grant funded scientific collaborators with appropriate Review Ethics Board (REB) protocols in place, see SOP#210: "New Protocols and Ethics".
- 1.2 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.
- 1.3 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, since we cannot otherwise detect it (i.e. magnetic fields cannot be seen or felt).
- 1.4 Dangerous and potentially lethal levels of electricity are used by both the 3T and 7T MRI systems. Therefore, it is important that all individuals working around the MRI systems be aware of the dangers and understand the safety issues concerning electricity. Current-carrying cables, connections, and junction points in the vicinity of the main magnetic field are particularly susceptible to damage due to the extreme Lorentz forces created through the normal operation of the system. Periodically, the effects of prolonged mechanical fatigue may result in breakage, thereby causing electrical arcing, sparking, and high heat levels before the system can shut down. In these instances, there is a high potential for personal injury as well as the possibility of a fire being ignited.
- 1.5 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 MRI Facility is conceptually divided into four Zones of increasing level of potential risk and access restriction, see SOP#100a: "MRI Facility Safety Zones".
- 1.6 Entry into the 3T/7T MRI Facility is restricted to the following individuals:
  - 1.6.1 Level 2 MRI Personnel, including facility staff, MRI Technologists, and MRI Operators, who have been trained, understand, and comply with the regulations outlined in SOP#130: "MRI Personnel Training".

- 1.6.2 Level 1 MRI Personnel, including investigators and associated research staff involved in studies utilizing the 3T/7T MRI Facility, who have been trained, understand, and comply with the regulations outlined in SOP#130: “MRI Personnel Training”.
- 1.6.3 Research Personnel, including staff, students, and other individuals associated with the investigators, whose presence is necessary for the successful execution and completion of the research project, and have complied with the regulations in SOP#120: “MRI Personnel Training”.
- 1.6.4 Facility Visitors who are supervised and accompanied by authorized Level 1 or Level 2 MRI Personnel, who meet and abide by the regulations listed in SOP#110: “MRI Facility Visitor Approval Policy”.
- 1.6.5 Volunteer Subjects and Patients participating in studies, who have complied with the regulations in Section 3: Entry Regulations below as well as those contained in SOP#210: “New Protocols and Ethics”. Note that volunteers and patients are NOT required to read SOP#210, rather it is the responsibility of the investigator to ensure that all studies and their corresponding subjects comply with the regulations set out by the Review Ethics Board (REB).
- 1.6.6 Essential Building Services Personnel required for maintenance and cleaning of the 3T/7T MRI Facility and for technical support of the computer systems in the facility, who meet and abide by the regulations outlined in Section 4: Essential Access below.
- 1.7 Access to Zones III and IV of the 3T/7T MRI Facility is subject to the approval of Level 2 MRI Personnel. Level 2 MRI Personnel, including the Associate Director, MRI Technologists, and MRI Operators, may grant or deny anyone entry to the facility at their discretion.

## 2. **Security Access – Procedure**

- 2.1 Anyone requiring Security Access to the 3T/7T MRI Facility must submit a letter to the Associate Director formally requesting access (see Appendix 8: Security Access Request Letter). In the event that Security Access is required by a graduate student or research personnel, the request must come from the supervising Primary Investigator, declaring that they will take full responsibility for the actions of their staff/student, including any acts of negligence which may cause damage to equipment or physical injury to themselves or individuals working under their supervision, while working in the 3T/7T MRI Facility. These letters are to be kept on file with the facility staff.
- 2.2 In order to obtain and maintain Security Access to the facility as Level 1 MRI Personnel, appropriate safety training must be completed as outlined by the facility in SOP#130: “MRI Personnel Training”.
- 2.3 MRI Operators and MRI Technologists require Security Access, and therefore must complete the training for Level 2 MRI Personnel as outlined in SOP#130: “MRI Personnel Training”.
- 2.4 Security Access will not be granted to anyone with medical devices, implants, or safety contraindications as listed in SOP#120: “General Safety”.
- 2.5 All access will be subject to the approval and discretion of the Associate Director and Senior Research MRI Technologist.

### 3. **Entry Regulations**

- 3.1 Visitors do not require Security Access to the 3T/7T MRI Facility. Rather, they must comply with the entry regulations listed in SOP#110: "MRI Facility Visitor Approval Policy". All visitors within the MRI Facility (Zones II, III, IV) must remain under the direct supervision of Level 1 or Level 2 MRI Personnel at all times.
- 3.2 Volunteers and patients participating in research studies do not require Security Access to the facility, but must complete a safety screening form provided by the investigator of the study. This screening form must comply with the REB protocol. See SOP#130: "New Protocols and Ethics". All study volunteers and patients within Zones II and III of the MRI Facility must remain under the supervision of Level 1 or Level 2 MRI Personnel, and may not proceed into Zone IV (magnet room) without the permission and supervision of Level 2 MRI Personnel.
- 3.3 Before entering Zone IV (magnet room), ALL individuals – including visitors, volunteers, patients, research subjects, Research Personnel, Level 1 MRI Personnel, Essential Building Services Personnel, and others – MUST complete and sign the facility's "Magnetic Resonance Environment Screening Questionnaire" (see Appendix 1) and have it reviewed, signed, and approved by an authorized individual. All access to the magnet room is subject to the approval and discretion of authorized Level 2 MRI Personnel. Completed screening questionnaires will be kept on file with the Senior Research MRI Technologist in a secure filing cabinet.
  - 3.3.1 Level 2 MRI Personnel, including the Facility Director, Associate Director, MRI Technologists, and MRI Operators, may refuse anyone entry into Zones III or IV at their discretion.
  - 3.3.2 Researchers, Research Personnel, patients, research subjects, Level I MRI Personnel, and others who regularly require entry into the 3T/7T MRI Facility and have completed the "Magnetic Resonance Environment Screening Questionnaire" do not need to complete a new questionnaire before each admittance. However, it is the responsibility of these individuals to inform Level 2 MRI Personnel (ie. their MRI Technologist/Operator) of any change in status (eg. if they undergo surgery, have an eye injury with metal, or obtain any metallic implants or devices). After any change in status these individuals must complete a new screening questionnaire and obtain approval before entering Zone IV (magnet room).

### 4. **Essential Access**

- 4.1 Essential Building Services Personnel must NOT enter Zone III of the MRI Facility without the approval and supervision of Level 2 MRI Personnel (ie. Facility Director, Associate Director, or MRI Technologist).
- 4.2 Essential Building Services Personnel must NOT enter Zone IV (magnet room) without the approval, accompaniment, and direct supervision of Level 2 MRI Personnel.
- 4.3 Essential Building Services Personnel are not permitted to bring visitors into the 3T/7T MRI Facility.
- 4.4 Building Services is responsible for instructing the cleaning staff of the restrictions set in place by the 3T/7T MRI Facility.