

ROBARTS RESEARCH INSTITUTE

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

Standard Operating Procedure #120-01
Last Updated: July 28, 2008

Safety and Operator Training

1. Introduction

- 1.1 Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths present 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 size 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 important that all those entering the facility be aware of the presence of the field, as it cannot be detected by our person in any way, i.e. magnetic fields cannot be felt, seen, or smelt.
- 1.3 There exist dangerous and potentially lethal levels of electricity in both the 3T and 7T MRI systems. As such, it is important that all individuals working around the MRI systems be aware of the dangers and therefore knowledgeable as to the safety issues concerning electricity. Furthermore, 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 will result in breakage causing electrical arcing, sparking and high heat levels before the system can shut down. There therefore becomes a high potential for personal injury and the possibility of a fire being ignited.
- 1.4 Due to the nature of the MR environment and the many safety risks present, all those wishing to obtain security access are required to follow the procedures specified below in section 2. All operators of the 3T and 7T MRI systems must be authorized by the facility and are required to follow the procedures specified below in sections 2 and 3.

2. Training for Individuals with 3T/7T MRI Facility Security Access

- 2.1 Individuals wishing to obtain security access to the facility are required to read all SOP's and to produce their signature declaring that they have read, understood, and plan to follow all of the guidelines set in place by the SOP's.
- 2.2 Individuals wishing to obtain security access must also complete the Magnetic Resonance Environment Screening Form (see Appendix).
- 2.3 It is mandatory that all individuals with 3T/7T security access participate and complete the 3T/7T MRI Facility Safety Training course. The course will be held onsite on an annual basis with content determined by the facility staff.

3. **Operator Training**

- 3.1 Operators are required to read all SOP's and to produce their signature declaring that they have read, understood, and plan to follow all of the guidelines set in place by the SOP's.
- 3.2 Operators are also required to complete the Magnetic Resonance Environment Screening Form (see Appendix).
- 3.3 Due to the responsibility incurred when operating the scanner, and the importance of the safety of the volunteer/patient and experimental support personnel, all operators are required to obtain and hold a valid Emergency First Aid Training certificate and CPR Level B Training certificate. Operators are also required to complete AED (Automated External Defibrillator) Training.
- 3.4 It is mandatory that all operators participate and complete the 3T/7T MRI Facility Safety Training course. The course will be held onsite on an annual basis with content determined by the facility staff.
- 3.5 Both the Robarts 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. Operators are therefore required to complete extensive training of the system and its components to ensure the wellbeing of the volunteers, patients and experimental support personnel as well as the MRI system itself. This training will be held onsite with extent determined by the facility staff.
- 3.6 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.