Centre for Neuroscience Studies

fMRI Facility

Standard Operating Procedures #15

MRI Facility Core Services

Revision #4, January 2010

1. Introduction

i. The 3T 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 facility resources are available to peer-reviewed grant funded scientific collaborators with appropriate Review Ethics Board (REB) protocols in place. See SOP# 04 "New Protocols and Ethics Procedures".

ii. Full-time technical support for scanner operation is provided and included in hourly rates (see SOP# 13 "System Billing Guide and Standard Rates") during regular weekday hours, Monday through Friday, 9:00 am – 4:30 pm. Scanning support for after-hours and weekend scanning may be arranged on a subcontract basis. For scanner scheduling please contact the MR technologist at fmri@queensu.ca .

2. Core Services and Responsibilities

i. All The Queen's MRI Facility provides access to a 3 tesla Siemens Magnetom Trio® with TIM® (total imaging matrix) technology. This is a complete state-of-the art clinical MRI system. This system is available to researchers from any institution, but priority is given to Queen's faculty members. Approvals for access and use of the system must first be obtained from the Facility Management Committee (see SOP # 04 "New Protocols and Ethics Procedures" and SOP # 01 "Authorization for Access to the 3T MRI Facility")

ii. The Facility also provides the services of an MR Technologist to operate the MRI system for research protocols. The assistance provided by the Technologist includes operating the MRI system, positioning research subjects, maintaining usage schedules and records, confirming investigators have completed required safety checklists and screening forms prior to allowing a research subject to enter the magnet room, and transferring image data to the data storage server. The Technologist does not setup peripheral stimulation or monitoring equipment, handle or position research animals, or carry out data analysis for investigators.

iii. The facility provides access to stimulation and monitoring equipment that is suitable for fMRI studies. The available equipment includes a projector and screen for visual display, an eye-tracking system, button-response pads, an auditory stimulation system, and a thermal stimulation system. Monitoring equipment includes ECG, peripheral pulse, and respiration monitoring equipment that is incorporated into the MRI system. This information as well as trigger signals from the MRI hardware are relayed to a data acquisition board that can be used for recording signals and triggers or conditioning trigger signals. A computer for stimulus delivery is also provided, as is operating software in relevant languages (such as MatLab) for basic tasks, or as example templates for development of custom programs. See SOP # 09, "General Experimental Procedures", and SOP #11, "Equipment Handling and Procedures"

iv. The Facility provides data storage for one month on a dedicated data storage server which is accessible via the internet at an address that will be provided to users of the Facility. The data transferred to the server is also archived on tape and a long-term data archive is maintained (see SOP#12 “Data Handling”).

v. The Facility provides safety training which is required for all users of the facility and its services (see SOP# 03 “Safety and Operating Training Procedures”).

vi. The Facility provides training in the use of all stimulation and monitoring equipment to investigators and their support staff with approved protocols (see SOP# 04 “New Protocols and Ethics Procedures”).

vii. The Facility provides standard approved forms for MRI safety screening of research subjects, and templates of protocols and subject information packages for ethics and Facility approvals (see SOP# 02 “3T MRI Facility Visitor Approval Policy” and SOP# 04 “New Protocols and Ethics Procedures”).

viii. The Facility maintains records of approved protocols, system usage, research studies carried out, and secure and coded volunteer records including safety checklists and records of time spent in the MRI system.