

Centre for Neuroscience Studies

fMRI Facility

Standard Operating Procedure #07

Emergency Fire Procedure

1. Introduction

- i. 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 flexibility of the research system and associated peripheral hardware.
- ii. The static magnetic field in the 3T 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 smelled.
- iii. Working within and around the high field MRI requires in depth training on safety and Standard Operating Procedures, and documented proof of other necessary training. See SOP# 03 "Safety and Operator Training Procedures."
- iv. It is imperative that all personnel who are within and around the 3T MRI facility always keep in mind the potential safety risks, and act in accordance with the guidelines set out in the Standard Operating Procedures.

2. Smoke Detection

- i. There are signs of a potential fire present before a fire occurs. Operators need to be aware of the signs to prevent injury to the volunteer/patient and other experimental support personnel in the magnet room and the control room during a scan session. Three basic cases are outlined below.
- ii. The first sign of a potential fire is often detection of a subtle odour.
- iii. Another sign of potential fire is small amounts of smoke. There may not be enough smoke to set off the detector, so it is important to always be aware of the possibility of the presence of smoke. If anyone in the control room or the magnet room notices smoke, even if the smoke detector alarm is not sounding, the procedure below must be followed.
- iv. The final case is one in which the smoke detector has gone off and an alarm is sounding in the magnet room.
- v. In each of the above circumstances the operator must:
 - a. Abort the current scan (if in progress)

- b. Shut-down the electrical power to the MRI equipment by pressing one of the red shut-off buttons (one is located inside the Magnet Room to the left of the door, and one is in the equipment room). See SOP# 08 "Emergency Shut-Down and Quench Procedures" for the procedure.
 - c. Remove the research subject from the Magnet Room.
 - d. Investigate the source of the odour or smoke.
 - e. Close the Magnet Room door.
 - f. Immediately notify the Facility Director.
- vi. It is important to keep in mind that any smoke or odour caused by heat can contain chemicals that are harmful if inhaled. Limit your exposure and close the magnet room door to prevent the noxious fumes from permeating the rest of the building.

3. Emergency Fire Procedure

- i. Remember to use common sense! There are three basic steps to follow:
 - a. Ensure your own safety
 - b. Ensure the safety of the volunteer/patient in the magnet
 - c. Contain the fire if possible. If it is not possible to contain the fire, follow the procedure in "Emergency Fire Procedure for Uncontrollable Fires."
- ii. Shut down the electrical power to the MRI equipment by pressing one of the red electrical shut-off buttons. See SOP# 08 "Emergency Shut-Down and Quench Procedures" for the procedures. They are located:
 - a. In the Equipment Room, to the left as you enter the door
 - b. In the Magnet Room, to the left as you enter the door
- iii. Remove the volunteer/patient from the scanner.
 - a. Press the "Home Position" button on the front face of the magnet to the right or left of the bore. In the case of loss of power or defective motorized drive, activate the emergency table release located under the support frame of the patient table and withdraw the bed from the magnet manually (see SOP #10 "Exiting A Person From The Magnet In An Emergency").
 - b. If the volunteer/patient is not responding or requires medical attention, follow the procedure set out in SOP# 06 "Emergency Procedure."
- iv. Activate the fire alarm located in the Control Room, to the right of the door from the Waiting Rooms into the Control Room (as you enter).
- v. Contain the fire.
 - a. The non-magnetic fire extinguisher is located to your right when you enter the Control Room.
 - b. If possible, use the non-magnetic fire extinguisher to put the fire out.
 - c. If it is not possible to contain the fire using the non-magnetic fire extinguisher, proceed to "Emergency Fire Procedure for Uncontrollable Fires."
- vi. Close the Magnet Room door.

- vii. Notify the Facility Director and Queen's Security (ext 36733) immediately following the incident. The facility staff must then file an appropriate Queen's University incident report of the situation.

4. Emergency Fire Procedure for Uncontrollable Fires

- i. Always remember to:
 - a. Ensure your own safety
 - b. Ensure the safety of the volunteer/patient in the magnet
- ii. Follow steps 3i to 3vi in "Emergency Fire Procedure"
- iii. If the fire cannot be contained using the non-magnetic fire extinguisher, the operator must proceed to quench the magnet following SOP# 08 "Emergency Shut-Down and Quench Procedures". The fire department must not enter the magnet room if the magnet is at field. The magnet must be quenched before the fire fighting crew is allowed to enter the Magnet Room. If the magnet is not quenched, the fire fighters' equipment, which is magnetic, could cause serious injury to themselves or anyone near the magnet at the time of their entry. The magnet is quenched by pressing one of the two red "Stop" buttons. See SOP# 08 "Emergency Shut-down and Quench Procedures" for the procedure. They are protected by plastic covers that must be lifted to access the button, and are located:
 - a. In the Control Room, on the wall above and to the left of the control console
 - b. In the Magnet Room, to the left as you enter the door
- iv. Evacuate the building.
- v. Notify the Facility Director and Queen's Security (ext 36733) immediately following the incident. The facility staff must then file an appropriate Queen's University incident report of the situation.