

York MRI Facility

Standard Operating Procedure #65-01

Quality Assurance Testing

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 flexibility of the research system and associated peripheral hardware.
- 1.2. As a result of the potential for serious injury, access to the 3T MRI Facility is restricted, and requires permission. See SOP #10-01 "Restricted Access Policy".
- 1.3. 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 #30-01 "Safety Training Procedures".
- 1.4. If you are unsure of any of the steps in any of the following procedures, DO NOT CONTINUE. Contact the Facility Director or MRI Technologist for further instruction.

2. Weekly Quality Assurance Tests

- 2.1. Quality Assurance Tests are completed on a weekly basis on Monday mornings. General system QA tests and RF coil tests are performed on alternating weeks.
- 2.2. To perform the General System QA or RF coil tests:
 - 2.2.1. Select Options → Service → Local Service.
 - 2.2.2. Type in the password.
 - 2.2.3. Click the Quality Assurance button.
 - 2.2.4. In the menu on the left you will see "Quality Assurance" followed by "General Quality Assurance" and "Coil Quality Assurance".
 - 2.2.5. Click on either "General Quality Assurance" or "Coil Quality Assurance". A list will appear on the right.
 - 2.2.6. Click the check boxes for the tests you want to run.
 - 2.2.7. Click Go on the bottom right of the screen.
 - 2.2.8. Follow the instructions as they appear in the pop-up windows.

3. Quality Assurance Tests for New Equipment

- 3.1. Any time a new piece of electronic equipment is installed in the magnet room a Quality Assurance test should be performed both before and after the installation to validate system performance and ensure the absence of deleterious effects due to the presence of the new device.

3.2. The Quality Assurance test in this case will include SNR, spike, RF noise, and gradient distortion tests. These tests should be performed as follows:

3.2.1. Select Options → Service → Local Service.

3.2.2. Type in the password.

3.2.3. Click the Quality Assurance button.

3.2.4. Select "General Quality Assurance".

3.2.5. From the list on the right select:

3.2.5.1. Coil Check

3.2.5.2. Spike Check

3.2.5.3. Gradient Sensitivity Check

3.2.6. Click Go on the bottom right of the screen.

3.2.7. Follow the instructions as they appear in the pop-up windows.

3.3. If the tests performed after installation of the equipment do not pass the Quality Control specifications, then further investigation is required to diagnose the source of the noise or distortion. If the reason for failing the Quality Assurance test is not determined, the equipment must be uninstalled and removed. The equipment may be reinstalled and retested at any time, following the above procedure.