



### MRISC STANDARD OPERATING PROCEDURES

<b>SOP Number-version:</b> MRI-5.1	
<b>SOP Title:</b> 7T ClinScan MRI QA	
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	<b>Effective Date:</b> 28-Sept-2020

#### 1.0 Purpose / Scope:

- 1.1 The purpose of 7T ClinScan MRI QA is to describe the procedures necessary for the (QA) quality assurance of the coils used for scanning on the Bruker 7T ClinScan MRI at the UK MRISC. Quality checks for research studies are performed as need by qualified research personnel. These quality check measurements assess the performance of the receiver coil and the accuracy of the images.
- 1.2 The Scope of this procedure covers all studies conducted on the Bruker 7T ClinScan small animal MR imager at the UK MRISC.

#### 2.0 Definitions: (if applicable)

- 2.1 Magnetic Environment: The area where the magnetic field is greater than 5 gauss resulting in the potential for objects to become missiles or projectiles as they are attracted into the magnetic field of the scanner. Individuals who may have cardiac pacemakers or other implants and devices may be at risk to enter the magnetic environment. The magnetic field is always present and is three dimensional around the scanner.
- 2.2 MRI: Magnetic resonance imaging (MRI) is a medical imaging technique that uses a magnetic field and computer-generated radio waves to create detailed images of organs and tissues.
- 2.3 Phantom: a specially designed object that is scanned or imaged in the field of medical imaging to evaluate, analyze, and tune the performance of the MRI.

For additional definitions, see also the Glossary of Terms located on the GRP Access Server \\prdlcancifs01.mc.uky.edu\Dept\Neuroscience\GRP or IP address \\172.25.104.37\grp\$.

### **3.0 Specialized Materials & Equipment:** (if applicable)

- 3.1 Bruker 7T ClinScan small animal MRI, *syngo* MR B15
- 3.2 MRI Test Phantom(s) for QA Measurements
- 3.3 Receiver coil(s): rat head, mouse head, and crycoil
- 3.4 Isoflurane and Desflurane anesthesia equipment

### **4.0 Procedures:**

- 4.1 Quality assurance (QA) testing is performed once every two months on commonly used MRI coils and documented on Form F-MRI-5.1, Attachment 1 (A1), 7TClinScan MRI QA.
- 4.2 QA procedures are performed using phantoms specially designed by the manufacturer for this purpose and according to guidelines set forth by Bruker
- 4.3 Bruker coils used at the MRISC are uniquely identified and labeled using a BC prefix
  - 4.3.1 Mouse Head Coil (BC001)
  - 4.3.2 Rat Head Coil (BC002)
  - 4.3.3 Cryo Coil (BC003)
- 4.4 Data generated contains the identifier of the coil used and the coil ID is recorded all equipment maintenance, testing, or repair records.
- 4.5 QA testing and results are recorded in F-MRI-5.1, Attachment 1 (A1), 7TClinScan MRI QA, including actions taken in case of failure to meet specifications
- 4.6 If a test fails, the MRISC physicist (DP) is immediately notified
- 4.7 In cases where the coil cannot be repaired in house, it will be sent out to the manufacturer (Bruker) for repair and a notice to users will be posted on the Stratocore facility management and reservation system, Users who may have already booked time for studies that require the particular coil will be notified directly. Applicable repair documents are retained in the equipment records.

4.8 Isoflurane and desflurane equipment is calibrated annually and the date is recorded on the equipment label. A permanent record of the calibration is retained which contains the equipment identifier.

**5.0 Attachments:** (if applicable)

5.1 F-MRI-5.1, Attachment 1 (A1), 7TClinScan MRI QA

**6.0 References:** (if applicable)

6.1 ISMRM & SMRT MR Safety Resources <https://www.ismrm.org/mr-safety-links/>

6.2 FONAR – MRI Glossary <http://www.fonar.com/glossary.htm>

**7.0 Record Retention:**

7.1 The signed and dated MRI QA verification forms and other equipment records are kept by the MRISC Administrator.

**8.0 Change History:**

Rev.	Effective Date	Summary of Changes
1	31-May-2020	New procedure



**ATTACHMENT 1  
7TClinScan MRI QA**

**Test date:** \_\_\_\_\_

**Operator:** \_\_\_\_\_

**2.1 Mouse Head Coil (BC001)**

Coil	SNR	Specification
Series 1 1/3		>56
Series 1 2/3		>56
Series 1 3/3		>56
Ch1		>32
Ch2		>32
Ch3		>32
Ch4		>32

Note any channel not performing at

Tube in cradle all the way  
Try to center perfectly

**2.2 Rat Head Coil (BC002)**

Coil	SNR	Specification
Series 1 1/3		>80
Series 1 2/3		>80
Series 1 3/3		>80
Ch1		>40
Ch2		>40
Ch3		>40
Ch4		>40

**2.4 Cryo Coil (BC003)**

Coil	SNR	Specification
Ch 1		>45
Ch 2		>45
All Channels		>50

**Action taken in case of equipment failing to meet specifications (include equipment ID, date and initials):**