



ACR MRI Accreditation Program

MRAP Overview

- Six modules: Head, Spine, MSK, Body, MRA, Cardiac
- Allows accreditation of whole body, dedicated MSK and certain specialty MRI systems.
- Large ACR MRI phantom
- Small ACR MRI Phantom added for use in small bore orthopedic MRI systems



ACR MRI Program

MRAP Overview

Accreditation submissions:

- 1. Physicist/MRI Scientist's Annual Equipment Evaluation report
 - System tests including all RF coils
 - Technologist QC Program review
 - MR Safety Assessment
- 2. Clinical images depending on module selection
- 3. Phantom images large or small phantom depending on module and system design

ACR Breast MRI Program

BMRAP Overview

Separate program established in 2010

Accreditation submissions:

- 1. Physicist/MRI Scientist's Annual Equipment Evaluation report
 - System tests including all RF coils, breast coil
 - Technologist QC Program review
 - MR Safety Assessment
- 2. Clinical case (bilateral) BI-RADS category 6: known, enhancing, biopsy-proven malignancy
- 3. Phantom images not currently submitted.



Breast MRI Technical Requirements

- 1.5 or 3T MRI systems
 - Dedicated breast MRI system or whole body MRI system with breast imaging capability
 - Dedicated breast coil capable of simultaneous bilateral imaging
 - Table top coils or detachable breast table with integrated imaging and biopsy coils
 - Modern breast coils are phased array to improve speed and SNR

MR Annual Equipment Evaluation Summary Form

Available under Gather Data section, required to include in the Physicist/MRI Scientist's annual report:

- Equipment Evaluation Summary of all tests
- Evaluation of Site's Technologist QC Program
- MR Safety Program Assessment



ACR MRI Programs: Statistics as of May 1, 2018						
Active*		Accredited				
Units	Facilities	Units	Facilities			
2055	1849	1889	1804			
9376	7312	9143	7203			
	ACR N tatistics Units 2055 9376	ACR MRI Prog atistics as of Ma Extine Units Facilities 2055 1849 9376 7312	ACR WRI Programs: stistics as of May 1, 2018kAccreditionkAccreditionUnitsFacilitiesUnits205518491889937673129143			



- Update of 2004 QC Manual
- Interslice RF interference test removed
- Magnetic field homogeneity assessment: alternative methods described
- MRI safety program assessment: new checklist
- Other changes and additions to improve clarity

2015 ACR MRI Quality Control Manual

Radiologist's section

Technologist's section

Medical Physicist's section

Quality control program and medical physicist involvement essentially the same for both programs MRAP and BMRAP



MR Accreditation Program Testing Instructions

Combines the instructions necessary for the clinical exams, phantom testing and general submission.

- Includes content of former *Clinical Image Quality Guide*
- Includes content of former Large and Small Phantom Testing Instructions



ACR MR Accreditation Program Testing Instructions, www.acr.org, May 28, 2017.

MR Accreditation Program Large Phantom Test Guidance

Provides information about the large phantom tests

- Purpose of each test
- How the measurements are made
- Clarified action criteria for images submitted for accreditation:
 - Recommended values "should be within ... "
 - Failure limits "will fail if outside these limits..."
- Causes of failure and corrective actions



Accreditation Program

Phantom Test Guidance for Use of the Large MRI Phantom, www.acr.org, April 17, 2018.

MR Accreditation Program Small Phantom Test Guidance

Provides information about the small phantom tests

- Purpose of each test
- How the measurements are made
- Clarified action criteria for images submitted for accreditation:
 - Recommended values "should be within ... "
 - Failure limits "will fail if outside these limits..."
- Causes of failure and corrective actions

Phantom Test Guidance for Use of the Small MRI Phantom for the
RADIOLOGY
MRI Accreditation Program
Phantom Test Guidance for Use of the Small MRI Phantom,























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2015 ACR MRI Quality Control Manual

Includes recommended slice # for weekly QC and typical lowcontrast scores by field strength. Table 1. Recommended slice of the ACR large MRI phantom to use for weekly low-contrast detection QC and typical number of spokes visible in the recommended slice and on all slices as a function of magnetic field strength.

	Low-Contrast Detectability Recommendations by Field Strength for Large ACR Phantom for the ACR T1 Series						
Field Strengt	h Recommended weekly QC slice #	Typical number of spokes visible in recommended QC slice	Total number of spokes on all slices				
0.2	11	4	12				
0.3	11	5–7	21				
0.5	10	6–9	27				
0.7	10	6-8	31				
1.0	9	7-8	34				
1.5	8	6–9	36				
2.0	8	9-10	38				
3.0	8	10	40				

ACR MRI QC Manual, 2015, American College of Radiology.







New FAQs

FAQ: Is it acceptable to measure SNR for daily/weekly QC instead of recording an LCD score?

Answer: Yes, SNR is an acceptable alternative to LCD scoring for daily/weekly phantom QC. However, LCD scores must be included in the Annual System Performance Evaluation.

https://www.acraccreditation.org/How-To/MRI-Accreditation-FAQ

Planned Program Changes

- 1. ACR Large and Small MRI Phantom re-design
 - Geometric accuracy section: the grid insert is designed to guide the phantom diameter measurements in order to assess geometric accuracy.
 - Manufacturer running out of material
 - Insert re-design made of acrylic with equally spaced holes to guide measurements





Planned Program Changes

2. Re-design of the resolution pattern

- Currently the ACR Large phantom includes 1.1, 1.0 and 0.9 mm hole patterns.
- Addition of 0.8 mm pattern
- Resolution Pass/Fail limits will not change.

1.1	1.0	0.9	0.8





Details to be developed over the next 1-2 years



- ACR has revised guidance documents for the MRI and Breast MRI Accreditation Programs.
- 2015 ACR MRI QC Manual was updated to improve instructions.
- Large and small phantom test documents now clarify phantom measurement recommendations and pass/fail limits for accreditation submission.
- Coming changes to the ACR MRI programs include changes to existing phantoms, development of a medium phantom that fits into modern phased array head coils, and incorporation of Breast MRI as a new module in the MRI program.

Thank You!