



# Magnetic Resonance Imaging

Candidates applying for certification and registration under the postprimary eligibility pathway are required to meet the Professional Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Magnetic Resonance Imaging Clinical Experience Requirements* describe the specific eligibility requirements that must be documented as part of the application for the certification and registration process.

The purpose of the clinical experience requirements is to verify that candidates have completed a subset of the clinical procedures within a discipline. Successful performance of these fundamental procedures, in combination with mastery of the knowledge and cognitive skills covered by the examination, provides the basis for the acquisition of the full range of clinical skills required in a variety of settings.

The requirements are periodically updated based upon a practice analysis which is a systematic process to delineate the job responsibilities typically required of magnetic resonance imaging (MRI) technologists. The result of this process is a task inventory. An advisory committee then determines the number of clinical procedures required to demonstrate adequate candidate experience in performing the tasks on the inventory.

Candidates for magnetic resonance (MR) certification and registration must document performance of a minimum of 125 repetitions of magnetic resonance imaging procedures according to the criteria noted below. Procedures are documented, verified, and submitted when complete via an online tool accessible through My ARRT Info account on arrt.org. ARRT encourages individuals to obtain education and experience beyond these minimum requirements.

Completion of each procedure must be verified by an ARRT certified and registered technologist (postprimary certification not required) or an interpreting physician. The verification process is described within the online tool.

## MRI Safety Requirements

Candidates must demonstrate completion of training and education in the eight areas of MRI safety listed below:

- Screening patients, personnel, and non-personnel for MR safe, MR conditional, and MR unsafe devices and objects
- Identify MR safety zones
- Static magnetic field (\*e.g., translational and rotational forces)
- Radiofrequency field (e.g., thermal heating [SAR], coil positioning, patient positioning, insulation)
- Gradient magnetic fields (e.g., induced voltages, auditory considerations)
- Communication and monitoring considerations (e.g., sedated patients, verbal and visual contact, vital signs)
- Contrast media safety (e.g., NSF, renal function)
- Other MRI safety considerations (e.g., cryogen safety, fire, medical emergencies, laser alignment lights)

Completion of the MRI safety requirements must be verified by an ARRT certified and registered technologist (postprimary certification not required), a medical physicist, or an interpreting physician.

\*The abbreviation "e.g., " is used to indicate that examples are listed in parenthesis, but that it is not a complete list of all possibilities.



## Specific MR Imaging Procedure Requirements

The clinical experience requirements for MRI consist of 47 procedures in six different categories. The six categories include:

- A. Head and Neck
- B. Spine
- C. Thorax
- D. Abdomen and Pelvis
- E. Musculoskeletal
- F. Additional Imaging Procedures

Candidates must document the performance of complete, diagnostic quality procedures according to the following rules:

- Choose a minimum of 21 different procedures out of the 47 procedures on the following pages
- Complete and document a minimum of three and a maximum of six repetitions of each chosen procedure; less than three will not be counted.
- Complete a total of 125 repetitions across all procedures.
- No more than one procedure may be documented on one patient. For example, if an order requests an MRA of the head and neck for one patient, only one of these, including the post-processing procedures, can be documented for clinical experience documentation.
- MRI procedures performed in conjunction with a PET scan or Radiation Therapy planning or LINAC procedure are not eligible for MRI Clinical Experience documentation.
- Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

## Examples

The hypothetical scenarios below illustrate two ways of satisfying the clinical experience requirements. Numerous other combinations are possible.

**Candidate A:** This person who works in a specialized setting wanted to complete the minimum number of procedures. This person chose 21 different procedures and performed six repetitions of each procedure, for a total of 126 repetitions.

**Candidate B:** This person works in a facility that does most types of MRI scans, so completing a wide variety of procedures was quite feasible. This candidate completed a total of 42 procedures. Although most of these procedures were performed three times (the minimum), a few of them were performed four or five times each until the candidate reached at least 125 procedures.



## General Guidelines for MR Imaging Procedures

To qualify as a complete, diagnostic quality MRI procedure, the candidate must independently demonstrate appropriate:

Patient skills including:

- evaluation of requisition and/or medical record
- identification of patient
- documentation of patient history including allergies
- safety screening
- patient education concerning the procedure
- patient care and assessment
- preparation of examination room
- Standard Precautions
- preparation and/or administration of contrast media
- MRI safety procedures and precautions
- patient discharge with post-procedure instructions

Technical and procedural skills including:

- selection of optimal imaging coil
- patient positioning
- protocol selection
- parameter selection
- image display, networking, and archiving
- post-processing
- documentation of procedure and patient data in appropriate records
- completion of acquisition

Evaluation skills including:

- analysis of the image for technical quality
- demonstration of correct anatomic regions
- proper identification on images and patient data
- recognition of relevant pathology
- exam completeness



## Magnetic Resonance Imaging Clinical Experience Requirement Procedures

### A. Head and Neck

1. brain
2. IACs
3. pituitary
4. orbits
5. cranial nerves (non IACs)
6. vascular head MRA
7. vascular head MRV
8. brain perfusion
9. brain spectroscopy
10. soft tissue neck
11. vascular neck

### B. Spine

1. cervical
2. thoracic
3. lumbar
4. spinal trauma
5. sacrum-coccyx
6. sacroiliac (SI) joints
7. brachial plexus

### C. Thorax

1. chest (non cardiac)
2. breast
3. vascular thorax

### D. Abdomen and Pelvis

1. liver
2. pancreas
3. MRCP
4. adrenals
5. kidneys
6. enterography
7. vascular abdomen
8. female soft tissue pelvis (e.g., uterus)
9. male soft tissue pelvis (e.g., prostate)

### E. Musculoskeletal

1. temporomandibular joints (TMJs)
2. sternum/sternoclavicular (SC) joints
3. shoulder
4. long bones (upper extremity)
5. elbow
6. wrist
7. hand
8. finger/thumb
9. bony pelvis
10. hip
11. long bones (lower extremity)
12. knee
13. ankle
14. foot
15. arthrogram

### F. Additional Imaging Procedures

1. image post-processing (MIP reformation, MPR, subtraction)
2. CINE (e.g., CSF flow study, TMJs)

QC as a topic was moved to separate requirements (see next page).



## MRI Quality Control Procedures

Candidates must demonstrate competence in the seven quality control activities listed below. The first four procedures are performed on a QC phantom.

MRI Quality Control Procedures	Date Completed	Competence Verified By
Signal to Noise Ratio		
Center Frequency		
Transmitter Gain or Attenuation		
Geometric Accuracy		
Equipment Inspection (e.g., Coils, Cables, Door Seals)		
Monitor Cryogen Levels		
Room Temperature and Humidity		

Completion of the MRI quality control procedures must be verified by an ARRT certified and registered technologist (postprimary certification not required), a medical physicist, or an interpreting physician.