



# Magnetic Resonance Imaging

Certification and registration requirements for magnetic resonance imaging (MRI) are based on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists (ARRT) staff and the MRI Practice Analysis and Continuing Qualifications Requirements (CQR) Advisory Committee. The purpose of the practice analysis is to identify job responsibilities typically required of MRI technologists at entry into the profession. The results of the practice analysis are reflected in this document. The purpose of the task inventory is to list or delineate those responsibilities. The attached task inventory is the foundation for both the clinical requirements and the content specifications.

## Basis of Task Inventory

In 2018, the ARRT surveyed a large, national sample of MRI technologists to identify their responsibilities. When evaluating survey results, the advisory committee applied a 40% criterion. That is, to be included on the task inventory, an activity must have been performed by at least 40% of MRI technologists. The advisory committee could include an activity that did not meet the 40% criterion if there was a compelling rationale to do so (e.g., a task that falls below the 40% criterion but is expected to rise above the 40% criterion in the near future).

## Application to Clinical Requirements

The purpose of the clinical requirements is to verify that candidates have completed fundamental clinical procedures in MRI. Successful performance of these fundamental procedures, in combination with mastery of the knowledge and cognitive skills covered by the MRI examination, provides the basis for acquisition of the full range of clinical skills required in a variety of settings. An activity must appear on the task inventory to be considered for inclusion in the clinical requirements. For an activity to be designated as a mandatory requirement, survey results had to indicate that the vast majority of MRI technologists performed that activity. The advisory committee designated clinical activities performed by fewer MRI technologists, or which are carried out only in selected settings, as elective. The clinical requirements are available from ARRT's website ([www.arrt.org](http://www.arrt.org)) and appear in the *Primary Eligibility Pathway Handbook* and the *Postprimary Eligibility Handbook* also located on the ARRT website.

## Application to Content Specifications

The purpose of the ARRT MRI examination is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of MRI technologists at entry into the profession. The content specifications identify the knowledge areas underlying performance of the tasks on the task inventory. Every content category can be linked to one or more activities on the task inventory. Note that each activity on the task inventory is followed by a content category that identifies the section of the content specifications corresponding to that activity. The content specifications are available from ARRT's website ([www.arrt.org](http://www.arrt.org)) and appear in the *Primary Eligibility Pathway Handbook* and the *Postprimary Eligibility Handbook* also located on the ARRT website.



Activity	Content Categories
1. Sequence imaging examinations to avoid affecting subsequent examinations.	PC.1.G.1.D.
2. Verify patient's identity.	PC.1.A.2.A., PC.1.B.
3. Evaluate patient's ability to understand and comply with requirements for the requested examination.	PC.1.B.
4. Obtain pertinent medical history.	PC.1.A.2.A., PC.1.B., PC.1.G.1., S.1.A.
5. Manage interpersonal interactions in an effective manner.	PC.1.B.
6. Explain and confirm patient's preparation (*e.g., diet restrictions, preparatory medications) prior to imaging.	PC.1.B.3.B.
7. Review imaging request to verify information is accurate, appropriate, and complete (e.g., patient history, clinical diagnosis, physician's order).	PC.1.A.2.A.
8. Explain imaging instructions to patient or patient's family (e.g., pre-procedure, post-procedure).	PC.1.B.
9. Respond as appropriate to imaging inquiries from a patient or a patient's family.	PC.1.B.
10. Verify examination protocols as needed.	PC.1.A.2.A., P.
11. Follow environmental protection standards for the handling and disposing of biohazardous materials (e.g., sharps, blood, body fluids).	PC.1.E.3.
12. Follow environmental protection standards for handling hazardous materials (e.g., cleaning materials).	PC.1.F.
13. Provide for patient safety, comfort, and modesty.	PC.1.A.1.C., PC.1.C.
14. Notify appropriate personnel of adverse events or incidents (e.g., patient falls, contrast reactions, patient burns).	PC.1.A.2., PC.1.C.3., PC.1.G.5.
15. Demonstrate and promote professional and ethical behavior (e.g., confidentiality, regulation compliance).	PC.1.A., PC.1.B.
16. Verify informed consent as necessary.	PC.1.A.1.A., PC.1.G.2.
17. Recognize abnormal or missing lab values relative to the imaging ordered (e.g., eGFR, creatinine, beta-hCG).	PC.1.G.4.C.
18. Communicate relevant information to appropriate medical professionals.	PC.1.A., PC.1.B., PC.1.C.3.D., PC.1.G., P.
19. Practice Standard Precautions.	PC.1.E.3.
20. Follow appropriate procedures when caring for patients with communicable diseases.	PC.1.E.

\* 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.



<b>Activity</b>	<b>Content Categories</b>
21. Use immobilization devices or positioning aids, as needed, to prevent patient movement and/or ensure patient safety.	PC.1.A.2.D., P.
22. Use proper body mechanics and/or patient transfer devices when assisting a patient.	PC.1.C.1.
23. Prior to the administration of a medication other than a contrast agent, review information to prepare appropriate type and dosage (e.g., lidocaine, glucagon).	PC.1.G.
24. Prior to the administration of a contrast agent, review information to prepare appropriate type and dosage.	PC.1.G.
25. Prior to the administration of a contrast agent, determine if patient is at risk for an adverse reaction.	PC.1.G.4., PC.1.G.5.
26. Use sterile or aseptic technique when indicated.	PC.1.E.2., PC.1.G.2.
27. Perform venipuncture.	PC.1.E.3.D., PC.1.G.2.C.
28. Administer contrast agents as required by the examination.	PC.1.G.2., PC.1.G.4., P.
29. Assess patient after administration of a contrast agent to detect adverse events.	PC.1.D.1., PC.1.G.5.
30. Obtain vital signs.	PC.1.C.3.A.
31. Recognize and communicate the need for prompt medical attention.	PC.1.C.3., PC.1.D., PC.1.G.5.
32. Administer emergency care (e.g., evacuate patient from zone IV, quench, code).	PC.1.C.2., PC.1.C.3., PC.1.D., S.1.D.4.
33. Clean, disinfect, or sterilize facilities and equipment.	PC.1.E.
34. Document required information on patient's medical record.	PC.1.B.1.A., PC.1.C.3.D., PC.1.G.5.D., IP.3.C.
35. Provide hearing protection to patient and others in zone IV.	S.1.B.3.B., S.1.B.3.E.
36. Maintain controlled access to zones III and IV to ensure safety of patients, visitors, and hospital personnel.	S.1.
37. Screen patient for ferrous and RF-sensitive material prior to entrance into magnetic field.	S.1.A.
38. Monitor RF induced heating (specific absorption rate [SAR]).	S.1.B.2.A., S.1.B.2.E.
39. Perform and document the results of QC tests (e.g., center frequency, signal to noise ratio, image quality, artifacts).	IP.1.D.
40. Interpret results of QC tests to assure that performance standards are met.	IP.1.D.
41. Inspect equipment to make sure it is operable and safe (e.g., coils, cables, door seals).	S.1.C., IP.1.D.8.
42. Notify appropriate personnel of equipment malfunctions and potential repairs as needed.	S.1.C., S.1.D.



**Content Categories**

Legend: PC = Patient Care,  
S = Safety, IP = Image Production,  
P = Procedures

**Activity**

43. Research implantable medical devices for safe, conditional, or unsafe labeling.	S.1.A.1.
44. Monitor scan room (e.g., cryogen levels, temperature, humidity).	S.1.D.1.
45. Select appropriate imaging sequences.	IP.1.A., IP.1.B., IP.3.A., IP.3.B., P.
46. Select alternate sequences to compensate for patient related issues or patient limitations (e.g., patient motion, metal artifact, claustrophobia, RF heating).	PC.1.C.3.F., IP.1., IP.2.
47. Manipulate parameters to compensate for patient related issues or patient limitations (e.g., patient motion, metal artifact, claustrophobia, RF heating).	PC.1.C.3.F., IP.1., IP.2.
48. Select optimal imaging coils.	IP.1.A.3., P.
49. Perform automatic or manual frequency tuning.	IP.1.B.3.F., IP.1.D.5., IP.2.A.12., P.
50. Select or adjust one or more imaging parameters (e.g., TR, TE, FOV, imaging plane, bandwidth, gap, slice thickness).	IP.2.A.
51. Select or adjust one or more imaging options (e.g., saturation pulse, flow compensation, fat suppression, gating).	IP.2.C.
52. Perform image post-processing (e.g., MPR, subtraction).	IP.3.B.3.
53. Assess images to determine successful completion of the procedure (e.g., anatomy, pathology, artifacts).	IP.1.C., IP.2., IP.3.A., IP.3.B., P.
54. Determine corrective measures and adjust parameters for images not of diagnostic quality.	IP.1.C., IP.2., IP.3.A., IP.3.B., P.
55. Store, transfer, or retrieve images from data storage devices.	IP.3.C.

**Enter patient data, position patient, and perform the following types of scans or procedures:**

**Head and Neck**

56. Brain (e.g., trauma, stroke)	P.1.A.1.
57. Brain for MS	P.1.A.2.
58. Brain for seizure	P.1.A.3.
59. Infant brain (less than one year old)	P.1.A.4.
60. Brain for CSF flow	P.1.A.5.
61. Brain perfusion	P.1.A.12.
62. Brain spectroscopy	P.1.A.13.
63. IACs	P.1.A.6.
64. Pituitary	P.1.A.7.

(Head and Neck continues on the following page.)



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**Head and Neck (continued)**

- |     |                           |           |
|-----|---------------------------|-----------|
| 65. | Orbits                    | P.1.A.8.  |
| 66. | Cranial nerves (non IACs) | P.1.A.9.  |
| 67. | Sinuses                   | P.1.A.14. |
| 68. | Soft tissue neck          | P.1.A.15. |
| 69. | Vascular head MRA         | P.1.A.10. |
| 70. | Vascular head MRV         | P.1.A.11. |
| 71. | Vascular neck             | P.1.A.16. |

**Spine**

- |     |                        |                                |
|-----|------------------------|--------------------------------|
| 72. | Cervical               | P.1.B.1.                       |
| 73. | Thoracic               | P.1.B.2.                       |
| 74. | Lumbar                 | P.1.B.3.                       |
| 75. | Sacroiliac (SI) joints | P.1.B.5.                       |
| 76. | Sacrum-coccyx          | P.1.B.4.                       |
| 77. | Spinal trauma          | P.Focus of Questions<br>(FOQ). |
| 78. | Whole spine            | P.1.B.6.                       |
| 79. | Brachial plexus        | P.1.B.7.                       |
| 80. | Lumbar plexus          | P.1.B.8.                       |

**Thorax**

- |     |                     |          |
|-----|---------------------|----------|
| 81. | Chest (non cardiac) | P.2.A.1. |
| 82. | Breast              | P.2.A.2. |
| 83. | Vascular thorax     | P.2.A.3. |

**Abdomen**

- |     |                  |          |
|-----|------------------|----------|
| 84. | Liver            | P.2.B.1. |
| 85. | Pancreas         | P.2.B.2. |
| 86. | MRCP             | P.2.B.3. |
| 87. | Adrenals         | P.2.B.4. |
| 88. | Kidneys          | P.2.B.5. |
| 89. | Enterography     | P.2.B.6. |
| 90. | Vascular abdomen | P.2.B.7. |



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**Pelvis**

- |     |  |          |
|-----|--|----------|
| 91. | Soft tissue pelvis (e.g., bladder, rectum) | P.2.C.1. |
| 92. | Female soft tissue pelvis (e.g., uterus)   | P.2.C.2. |
| 93. | Male soft tissue pelvis (e.g., prostate)   | P.2.C.3. |
| 94. | Vascular pelvis (femoral, iliac)           | P.2.C.4. |

**Musculoskeletal**

- |      |                                 |        |
|------|---------------------------------|--------|
| 95.  | Temporomandibular joints (TMJs) | P.3.A. |
| 96.  | Sternum                         | P.3.B. |
| 97.  | Sternoclavicular (SC) joints    | P.3.C. |
| 98.  | Shoulder                        | P.3.D. |
| 99.  | Long bones (upper extremity)    | P.3.E. |
| 100. | Elbow                           | P.3.F. |
| 101. | Wrist                           | P.3.G. |
| 102. | Hand                            | P.3.H. |
| 103. | Fingers (non thumb)             | P.3.I. |
| 104. | Thumb                           | P.3.J. |
| 105. | Bony pelvis                     | P.3.K. |
| 106. | Hip                             | P.3.L. |
| 107. | Long bones (lower extremity)    | P.3.M. |
| 108. | Knee                            | P.3.N. |
| 109. | Ankle                           | P.3.O. |
| 110. | Foot                            | P.3.P. |
| 111. | Arthrogram                      | P.3.Q. |
| 112. | Vascular extremities            | P.3.R. |

**Ancillary Procedures**

- |      |  |        |
|------|--|--------|
| 113. | CINE (e.g., CSF flow study, TMJs)                            | P.FOQ. |
| 114. | Surgical preplanning (e.g., stealth, brain lab, gamma knife) | P.FOQ. |