

ICAMRL STANDARDS FOR ACCREDITATION IN MAGNETIC RESONANCE IMAGING OPERATIONS

PART II

MAGNETIC RESONANCE TESTING (Equipment requirements are published in Part I.)

SECTION 1 Indications

STANDARD – Indications

1.1 MR testing is performed for appropriate indications.

Comment: Accepted indications will vary depending on clinical considerations that are provided by the referring healthcare provider and can only be assessed at the time of the examination. Appropriate indications include evaluation of patients with suspected pathology.

1.2 Indications for performance of a comprehensive or limited examination must be included.

1.2.1 BODY IMAGING

MR body imaging includes examinations of the chest, neck, abdomen, pelvis, breast and vascular structures and are a technological challenge due to physiological motion artifacts. However, since the emergence of fast scan and motion compensation techniques, MR examinations of the body have become more practical. The ability to acquire scan data during a breath hold has greatly improved spatial resolution of structures in areas previously degraded by motion artifacts. In addition, the ability of MR to demonstrate anatomy and pathology in multiple planes, and the improved conspicuity provided by chemical shift imaging, has made MR an important tool for imaging of body structures. In many instances, MR has become the imaging method of choice for demonstrating organ function and morphology, and the detection, differentiation and staging of benign and malignant lesions.

1.2.2 CARDIOVASCULAR IMAGING

Cardiovascular MRI involves imaging of the heart and central vascular system using single-planar and multi-planar acquisitions. Included in disorders of the heart are disorders of the myocardium, heart chambers, valves, coronary blood vessels, blood pathways and the pericardium. Included in disorders of the central vascular system are abnormalities of the aorta (ascending, arch, thoracic descending, abdominal descending and the iliac bifurcation), the pulmonary vasculature and the thoracic venous system.

1.2.3 MUSCULOSKELETAL IMAGING

MRI is a valuable tool in the visualization, detection and staging of a wide range of musculoskeletal disorders. These include degenerative, infectious, neoplastic and traumatic evaluation of articular structures, non-articular soft tissues, bones and bone marrow.

1.2.4 NEUROLOGICAL IMAGING

Neurological MRI involves imaging of the brain and spine using both 2D and 3D acquisitions and neurophysiological techniques. Included in disorders of the brain are conditions of the skull base, intra and extra cranial vasculature, the cranial nerves as well as other structures. Included in disorders of the spine are conditions involving the cervical, thoracic lumbar and sacral regions.

1.3 Verification of the indication: A process must be in place in the laboratory for obtaining and recording the indication. Before a study is performed, the indication must be verified and any additional information needed to direct the examination must be obtained.

SECTION 2

Techniques

2.1 Examination performance should include proper technique (e.g. pulse sequences, coil selection, and positioning).

2.1.1 Elements of study performance include, but are not limited to:

2.1.1.1 Proper coil selection and patient positioning.

2.1.1.2 Appropriate protocol selection based on the clinical indication and patient history.

2.1.1.3 Optimization of pulse sequence(s) and equipment settings that are necessary to achieve a diagnostic study and answer the clinical indication.

2.1.1.4 Utilization of appropriate software, workstations, techniques, and measurements to aid in the diagnosis

2.2 A protocol that defines the components of the standard examination must be in place and should be modified to answer the clinical indication.

2.3 The laboratory must have a complete, written description of each protocol that is being utilized for each MR examination and the protocol(s) should include:

2.3.1 The indication for the study

2.3.2 Anatomical region(s) to be imaged

2.3.3 Utilization of the correct scanner for the given indication

2.3.4 Clear criteria for deviating from protocols

2.3.5 Adherence to established practice guidelines

2.3.6 All orientations/views that will be displayed

2.3.7 Scanner settings or acquisition parameters to include:

- 2.3.7.1 Pulse sequence parameters
- A) Name of pulse sequence
 - B) TR/TE
 - C) FA
 - D) Matrix
 - E) FOV
 - F) Slice thickness
 - G) Interval or slice gap

2.3.8 Filming instructions to include window level and contrast settings, views, format, magnification.

2.3.9 Indication for IV contrast to include: type of contrast, amount, injection rate and scan delay protocol

2.3.10 Other medications used including dose and route of administration

2.3.11 Instruction on data archiving and transmission of images including what files are to be stored/transmitted.

SECTION 3

Procedure Volumes

STANDARD – Procedure Volumes

3.1 The annual procedure volume must be sufficient to maintain proficiency in examination performance and interpretation.

Comment: In general, a laboratory should perform a minimum of 300 magnetic resonance examinations annually. In some settings, laboratories may perform quality examinations with lower volumes.

SECTION 4

Technical and Interpretive Quality Assessment

STANDARD – Technical/Administrative Quality Assessment

4.1 Under the supervision of the Technical Director and the Clinical MR Director, the laboratory must have a defined quality assessment program that evaluates the ongoing technical and administrative quality of the imaging procedures performed in the laboratory.

4.1.1 This program should have predefined indicators of quality and predefined thresholds that indicate the need for corrective action. The laboratory should maintain reports of quality assessment evaluations and corrective actions taken.

4.1.1.1 Technical indicators may include, **but are not limited to**: adverse effects, poor quality of examinations, poor reproducibility of computer processing, etc.

4.1.1.2 Administrative indicators may include, but are not limited to: backlog for scheduled examinations, late reporting, and long patient waiting times.

4.1.2 Thresholds are determined for each indicator.

4.1.3 Corrective actions should be taken to improve the operation of the laboratory.

STANDARD – Interpretive Quality Assessment

4.2 Under the supervision of the Clinical MR Director, the laboratory **must have a defined quality assessment program that evaluates the ongoing quality of the interpretation of the MR examinations.**

This program should have predefined indicators of quality and predefined thresholds that indicate the need for corrective action. The Clinical MR Director should maintain reports, as necessary, of quality assessment evaluations and document, if applicable, corrective measures taken.

4.2.1 A quality assessment program may consist of, **but not be limited to**:

4.2.1.1 Correlation of interpretation of studies with patient outcome, such as results of surgery, biopsy, autopsy, etc.

4.2.1.2 Reproducibility of interpretation with previous interpretation, or with interpretation of the same study by other qualified interpreting physicians.