Guidelines for the Management of Patients with Embolization Coils Used for Cerebral Aneurysms or Arteriovenous Malformations Referred for MRI Examinations*

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In the clinical magnetic resonance imaging (MRI) setting, it is often necessary to manage patients with embolization coils used for cerebral aneurysms or arteriovenous malformations (AVMs)(1-6). MRI labeling information exists for numerous embolization coils used for those applications. By following the MRI labeling information (i.e., presented in the *Instructions for Use*, Product Manual, Patient Identification Card, etc.), patients with embolization coils used for cerebral aneurysms or AVMs have safely undergone MRI examinations, including those performed using MR systems operating at 3-Tesla. Notably, there has never been an adverse event reported in association with performing MRI exams in patients with these implants.

The standard policy that MRI labeling information is required before allowing the use of MRI in patients with embolization coils used for cerebral aneurysms or AVMs limits access to this important diagnostic imaging modality for those patients for which labeling information is unavailable. Taking into account the peer-reviewed literature and other related information (1-7), it is acceptable to perform MRI examinations in patients with all embolization coils used for cerebral aneurysms or AVMs by following specific guidelines developed by considering the primary safety concerns (i.e., magnetic field-related force, torque, RF-induced heating) for these implants.

Guidelines: A patient with embolization coils used for cerebral aneurysms or AVMs may undergo MRI using the following guidelines:

- 3-Tesla or less
- No restriction on the direction of the static magnetic field
- No restriction on the value of the spatial gradient magnetic field
- For embolization coils located *inside* of the area of the transmitted RF energy, use a whole-body averaged specific absorption rate (SAR) of 2-W/kg (i.e., operating the MR system in the Normal Operating Mode)
- For embolization coils located entirely *outside* of the area of the transmitted RF energy, a whole-body averaged specific absorption rate (SAR) of 4-W/kg (i.e., operating the MR system in the First Level Controlled Operating Mode) may be used
- Maximum imaging time, 15 minutes per pulse sequence, multiple pulse sequences are allowed

***Important Note:** The "*Guidelines for the Management of Patients with Embolization Coils Used for Cerebral Aneurysms or Arteriovenous Malformations Referred for MRI Examinations*" should only be implemented for use after the careful review by the supervising radiologist or other physician responsible for the MRI facility and with the adoption of the information as a written policy.

Important Note: Any deviation from the above MRI conditions requires prior approval by the supervising physician.

Important Note: These guidelines must be reviewed on an annual basis to confirm that no embolization coil used for the treatment of a cerebral aneurysm or an AVM has become available that substantially deviates from the above MRI conditions or that is labeled, MR Unsafe.

References

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5/2025