

Guidelines for the Management of Patients with Vascular Stents Referred for MRI Examinations*

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A vascular stent is an expandable tube-shaped device used to support and maintain blood flow through a narrowed or blocked blood vessel. Vascular stents may be bare metal, drug-eluting, or covered. Stent grafts used for the vascular system incorporate fabrics, such as Dacron, polytetrafluoroethylene (PTFE), or Gortex, that are deployed within a vessel to reinforce or replace damaged tissue. These implants include carotid artery stents, coronary artery stents, aortic aneurysm stent grafts, peripheral vascular stents, intracranial diverting stents or flow-diverting stents, and similar stents intended for use in the vascular system.

MRI labeling information exists for numerous vascular stents. By following the pertinent MRI labeling information (i.e., presented in the *Instructions for Use*, Product Manual, Patient Identification Card, etc.), patients with vascular stents 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 in patients with these implants.

The standard policy that MRI labeling information is required before allowing the use of MRI in patients with vascular stents 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 (1-10), it is acceptable to perform MRI examinations in patients with all vascular stents by following specific guidelines developed by considering the primary safety concerns (i.e., magnetic field-related force, torque, and RF-induced heating) for these implants.

Guidelines. A patient with a with vascular stent, including when there are two or more stents or two or more overlapping stents, 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 a vascular stent 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 a vascular stent 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 Vascular Stents 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 Radiologist or supervising physician.

Important Note: These guidelines must be reviewed on an annual basis to confirm that no new vascular stent has become available that substantially deviates from the above MRI conditions or that is labeled, MR Unsafe.

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05/2025