



School of Medicine
and Public Health

UNIVERSITY OF WISCONSIN-MADISON

Metal Artifact Reduction (MAR) Guidance

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Manufactured in USA

Metal Artifact Reduction (MAR) Guidance

MARS - Metal Artifact Reduction Software

UW provides both "with metal" and "without metal" protocols for Neuro and MSK protocols. The "with metal" protocols use a higher dose at 140kV, and enable MAR. We recommend reconstructing non-MAR, as well as MAR images to allow radiologists to better discern MAR induced artifacts.

While MAR is excellent for assessing the soft tissues near metal, it may cause artefactual changes in the hardware or adjacent bone that can mimic hardware fractures and loosening. Due to this issue, our physicians do not interpret the BONE kernel with MAR technique.

General Rule of Thumb [\[edit\]](#)

At UW we have slightly different guidelines for MSK, Neuro & Body protocols.

- If your scanner has MARS, we recommend enabling it on the STANDARD/SOFT TISSUE kernel for both Neuro, MSK and Body exams in the presence of metal hardware.

Tips for employing MAR:

1. If scanning extremities, MAR is only recommended for use on the 'affected side'. If there is metal present in the non-affected side, do your best to remove the metal from the scan FOV. For example, bend the non-affected knee to separate feet, ankles or knees, thus removing the metal from the scan range.
2. If scanning MAKO Hip or Knee, and unable to remove non-affected side that contains metal (i.e. hip prostheses in opposite hip), it is okay to scan this case on a scanner that does not have MAR capability.
3. If scanning a Body Pelvis with bilateral hip replacements, please turn MAR on the Thin ST series if scanning on a MAR capable scanner. Create the DMPPR's off this series.
4. If scanning a Chest or Abd/Pel with metal present (i.e. spine hardware, or pain pump) please turn MAR on the Thin ST series if scanning on a MAR capable scanner. Create the DMPPR's off this series.

How to apply MAR [\[edit\]](#)

Here is an overview of our current guidance:

	Thin soft tissue recon	Thin bone recon	Thick bone recon	Additional Thin soft tissue with MAR recon	Bone reformats	Soft tissue reformats
T & L Spines	No MAR	No MAR	No MAR	MAR	No MAR	MAR
MSK	No MAR	No MAR	N/A	MAR	No MAR	MAR
Neuro Head/Neck	No MAR	No MAR	No MAR	MAR	No MAR	MAR
Body	MAR	n/a	n/a	n/a	n/a	MAR

- **Make sure to label your reformats with the word "MAR" at the end of it. For example, CO MAR, CO BODY MAR, etc."**
- Common types of metal that require MAR include: dental fillings (amalgam) for head/neck cases, metal hardware for spines/MSK, and hip prosthesis for body exams should be applied to the Soft Tissue recon and reformats.

Coverage when metal is present [\[edit\]](#)

Follow the scan ranges prescribed in the protocol or ordered by the radiologist. You **do not need to cover the entire metal prosthesis** unless ordered by the radiologist for MAR to work. Please just be generous (add a few cm) above and below the area of interest when using MAR.