



**School of Medicine
and Public Health**

UNIVERSITY OF WISCONSIN-MADISON

Metal Artifact Reduction (MAR) Guidance

Copyright © 2026

REF Rev: 7.0



Manufacturer:
School of Medicine and Public Health
University of Wisconsin-Madison
610 Walnut Street
Madison, WI 53726

Manufactured in USA

Metal Artifact Reduction (MAR) or Single Energy Metal Artifact Reduction (SEMAR) Guidance

MARS - Metal Artifact Reduction Software

SEMAR- Single Energy Metal Artifact Reduction

Here is an overview of our current guidance:

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

- **Make sure to label your reformats with the word "MAR" or "SEMAR" at the end of it. For example CO MAR (CO SEMAR), CO BODY MAR (CO BODY SEMAR), etc."**
- Common types of metal that require MAR or SEMAR 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.

NEURO/MSK

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/SEMAR. We recommend reconstructing non-MAR or non-SEMAR as well as MAR/SEMAR images to allow radiologists to better discern MAR/SEMAR induced artifacts.

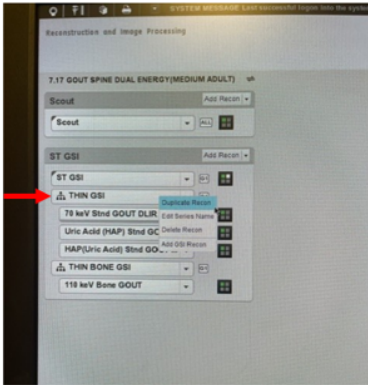
While MAR/SEMAR is excellent for assessing the soft tissues near metal, it may cause artefactual changes in the hardware or adjacent bone that can mimic hardware fractures and loosening. Due to this issue, our physicians do not interpret the BONE kernel with MAR/SEMAR technique.

1. If scanning extremities, MAR/SEMAR 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/SEMAR capability.
3. If scanning a Head and there is streaking in the posterior fossa from dental amalgams or intercranial metal, turn the additional MAR/SEMAR recon on the Thin ST series if scanning on a MAR/SEMAR capable scanner. Create the DMPR's off this series.
4. 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/SEMAR to work. Please just be generous (add a few cm) above and below the area of interest when using MAR/SEMAR.

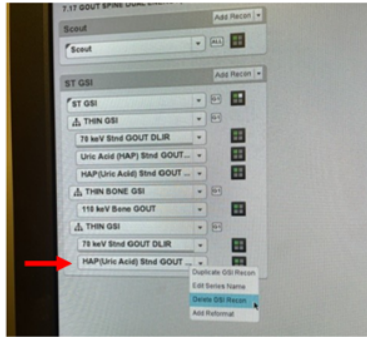
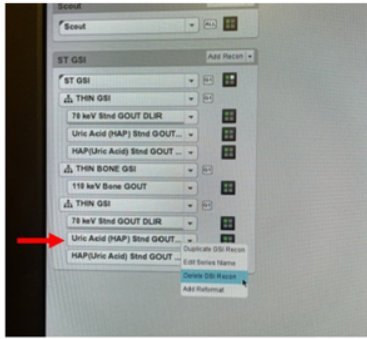
How to apply MAR when in a Dual Energy Spine/Extremity exam.

Step #1:

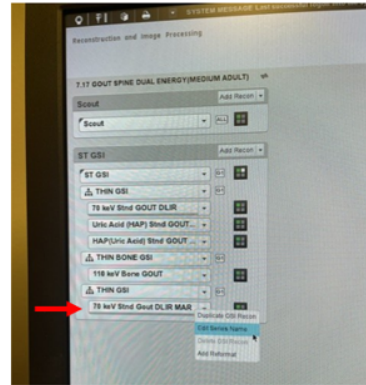
Duplicate "THIN GSI"
series

**Step #2:**

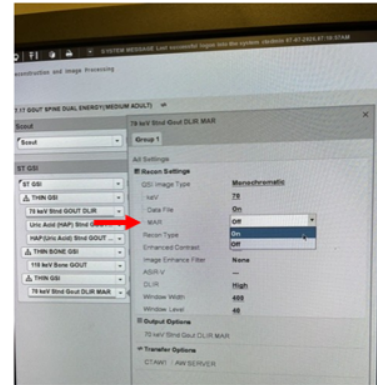
Delete Uric Acid (HAP) and
HAP (Uric Acid) recons

**Step #3:**

Rename last recon to
"70 keV Stnd Gout DLIR
MAR"

**Step #4:**

Open that recon, turn on
MAR and auto run



ABDOMINAL

When scanning a Abdominal exams and metal is present in any part of the scan range (i.e. spine hardware, pain pump or hip replacement) turn MAR/SEMAR on, on the Thin ST series when on a MAR/SEMAR capable scanner. Create the reformats off this series and label with MAR/SEMAR.

Reminders:

- Turn it on for the entire series/ scan range prescribed per protocol.
- Do not adjust any of the recon options/algorithms. (i.e., ASIR, IQ Enhance, DLIR, etc.), just merely turn MAR on.
- If a Thin ST non-MAR(or Thin ST non-SEMAR) series has been sent to PACS and you are creating and sending a MAR/SEMAR series, make sure to delete the non-MAR or non-SEMAR series from PACS.