

**MRA head noncontrast:**

3D ToF (time of flight) through circle of Willis, axial acquisition.

Coverage:

Bottom: foramen magnum

Top: superior edge of bodies of lateral ventricles.

Send to Synapse PACS:

1. Source images.
2. MIP: entire volume, rotate along z-axis (turntable)
3. MIP: entire volume, rotate along x-axis (somersault)
4. MIP: right ICA, right MCA, right ACA, and include A2 segment of left ACA. Rotate along z-axis
5. MIP: left ICA, left MCA, left ACA, and include A2 segment of right ACA. Rotate along z-axis
6. MIP: posterior circulation: bilateral vertebrals, basilar, bilateral PCA's. Rotate along z-axis and rotate along x-axis.

**MRV head noncontrast:**

(MR techs and radiologists should encourage ordering providers to use the MRV head with and without contrast, instead of the noncontrast protocol)

Apply saturation band just inferior to foramen magnum and skull base.

2D ToF through entire head.

Coverage:

Anterior: anterior edge of frontal bone skull

Posterior: posterior edge of occipital bone skull

Bottom: foramen magnum.

Top: vertex of skull.

Send to Synapse PACS:

1. Source images.
2. MIP: Rotate along z-axis

**MRV head with and without contrast:**

Perform the MRV noncontrast protocol first.

Then give IV contrast, and perform:

GAD ultrafast gradient echo T1 3D sequence:

Acquire in either AX or COR plane, then reconstruct the other 2 planes (including SAG)

Siemens: T1 3D MP-RAGE

Philips: T1 3D TFE

GE: T1 3D fast GRE, or T1 3D fast SPGR

Toshiba: T1 3D fast GRE

**MRA neck noncontrast:**

2D TOF AX multislab (from C7-T1 to C1)

3D TOF AX multislab (from C7-T1 to C1)

Send to Synapse:

Source images for both 2D & 3D TOF

MIP reconstructions for both 2D & 3D TOF:

- 1) Entire acquisition
- 2) Cut out right common carotid and right internal carotid as one unit. Rotate in z-axis only
- 3) Cut out left common carotid and right internal carotid as one unit. Rotate in z-axis only
- 4) Cut out left common carotid and right internal carotid as one unit. Rotate in z-axis only
- 5) Cut out bilateral vertebral arteries as one unit. Rotate in z-axis only

**MRA neck with and without contrast:**

(Do not perform 3D TOF)

2D TOF AX multislabs (from C7-T1 to C1)

3D COR precontrast preparatory sequence: (from aortopulmonic window to slightly superior to optic chiasm)

Siemens: FLASH 3D

GE, Philips, Toshiba: use what you currently use

GAD 3D COR (from aortopulmonic window to slightly superior to optic chiasm)

Send to Synapse:

Source images for both 2D TOF and 3D GAD

MIP reconstructions for both 2D TOF and 3D GAD:

- 1) Entire acquisition
- 2) Cut out right common carotid and right internal carotid as one unit. Rotate in z-axis only
- 3) Cut out left common carotid and right internal carotid as one unit. Rotate in z-axis only
- 4) Cut out left common carotid and right internal carotid as one unit. Rotate in z-axis only
- 5) Cut out bilateral vertebral arteries as one unit. Rotate in z-axis only