Neuroradiology Protocols

Change Log:

4/30/2026 (MW):

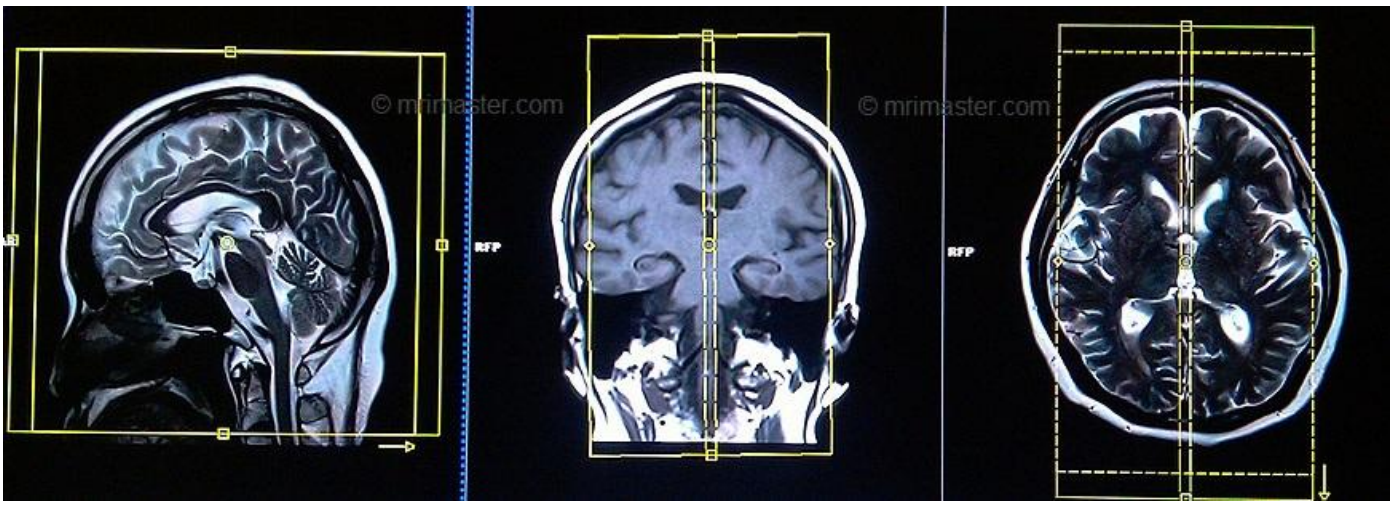
- Updated document formatting and removed scanner/field specific information (TR, time, freq)
- Updated **MS** protocol to reflect MS Consortium recommendation
- Dropped optional T2 from **pituitary**, adjusted FOV of thins to 16 cm
- Updated **epilepsy** for more consistent slice thickness, added vol T1, removed thick T1
- Updated **TMJ** replaced sagittal GRE with T2FS, replaced coronal GRE with T1, added axial, remove T1 sag
- Cleaned up **trigeminal** for clarity (one plane thin T2 with reformatted coronal and sagittal), replaced T1 post whole head 5mm with volumetric whole head as it seems redundant with 3mm
- Added Ax DWI as sequence for **face** and **neck**
- Removed spelling errors

MRI HEAD

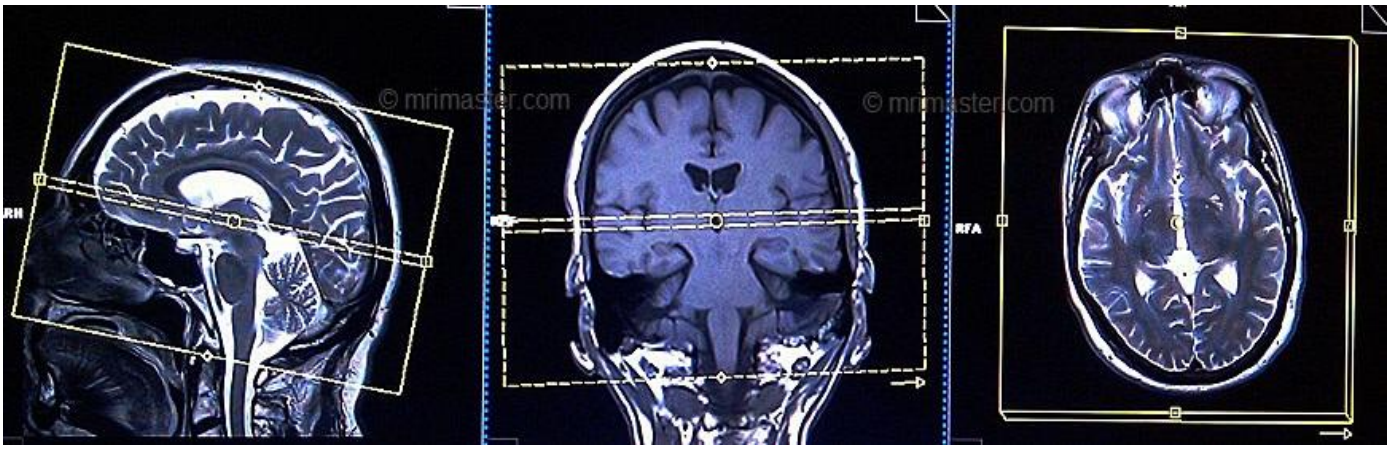
Indications: headache, tumor, lesion, mets, stroke, vertigo, infection, avm, seizure, trauma, dementia

Series	Note	FOV	Slice thickness	Gap
Sag T1 FLAIR		24	5.0	1.5
Ax DWI		24	5.0	1.5
Ax T2		24	5.0	1.5
Ax T2 Flair		24	5.0	1.5
Ax T1 SE		24	5.0	1.5
Ax SWAN/SWI		24		
Cor T1	(only if non-con)	24		
CONTRAST				
Ax T1 SE GD FS		24	5.0	1.5
Sag T1 GD volume	Include both ears	24	1.0	0
Reformats to PACS				
Ax T1 GD			3.0	
Cor T1 GD			3.0	

Sagittal: craniocervical junction to vertex, temporal lobes on each side, occipital to front lobes



Axial: craniocervical junction to vertex, temporal lobes on each side, occipital to front lobes



Coronal: craniocervical junction to vertex, temporal lobes on each side, occipital to front lobes

MRI HEAD and IAC

Indications: vertigo, dizziness, tumor, neuroma/schwannoma, sensorineural hearing loss, facial nerve palsy, labrynthitis, tinnitus

Series	Note	FOV	Slice thickness	Gap
Sag T1 FLAIR		24	5.0	1.5
Ax DWI		24	5.0	1.5
Ax T2		24	5.0	1.5
Ax T2 Flair		24	5.0	1.5
Ax T1 SE		24	5.0	1.5
Ax T1 FSE **thin**		18	3.0	0.3
Ax T2 3D **thin**	CISS or T2 Drive or Fiesta	18	0.8-1.0	0
CONTRAST				
Ax T1 SE GD FS	Whole head	24	5.0	1.5
Ax T1 FSE GD **thin**		18	3.0	0.3
Cor T2 SE GD **thin**		18	3.0	0.3
Reformats to PACS				
Cor T2 3D **thin**				
Sag T2 3D **thin**				

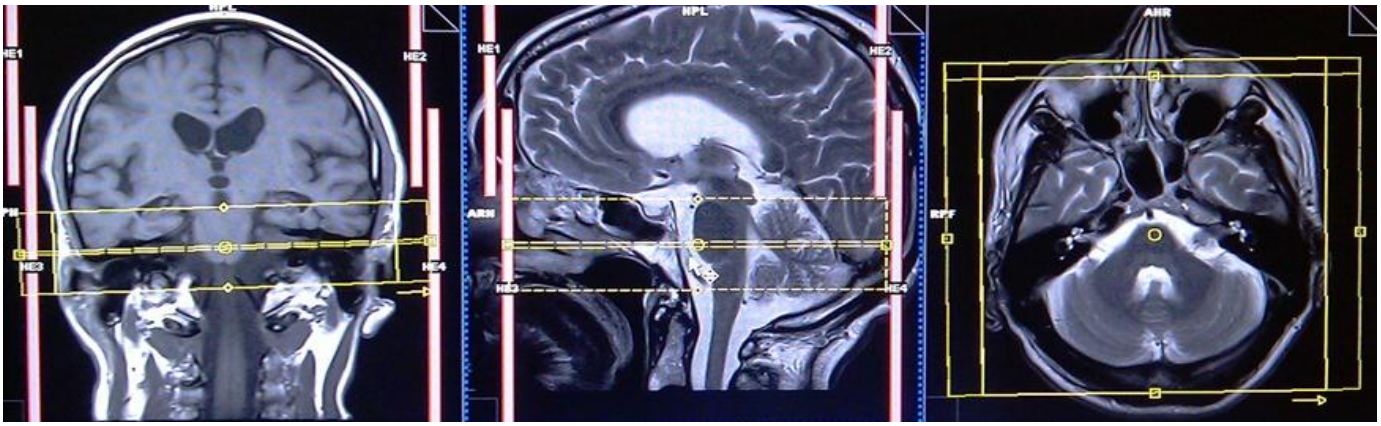
MRI IAC

Indications: only do if patient has been previously diagnosed with tumor, otherwise do MRI Head & IACs

Series	Note	FOV	Slice thickness	Gap
Ax DWI		24	5.0	1.5
Ax T2		24	5.0	1.5
Cor T1 FSE **thin**		24	5.0	1.5
Ax T2 3D **thin**	CISS or T2 Drive or Fiesta	18	0.8-1.0	0
Cor DWI non-epi	If indication cholesteatoma	18	3.0	0.3
CONTRAST				
Ax T1 SE GD FS	Whole head	24	5.0	1.5
Ax T1 FSE GD **thin**		18	3.0	0.3
Cor T2 SE GD **thin**		18	3.0	0.3
Reformats to PACS				
Cor T2 3D **thin**				
Sag T2 3D **thin**				

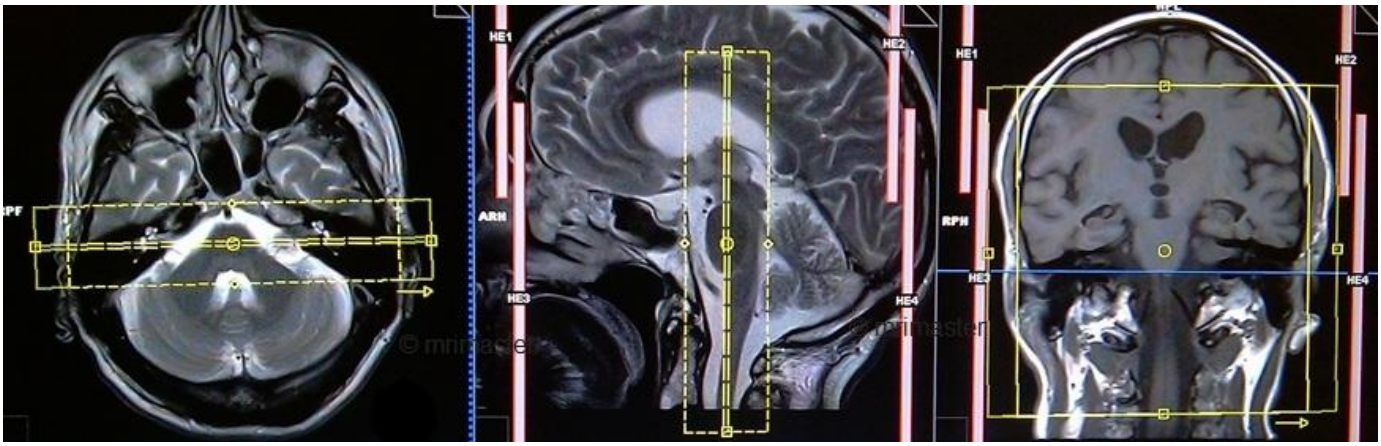
Axial Thin: parallel to IACs, perpendicular to brain stem

Coverage: IAC from posterior sphenoid sinus to fourth ventricle



Coronal Thin: parallel to IACs, perpendicular to brain stem

Coverage: IAC from hippocampus to C1 vertebral body

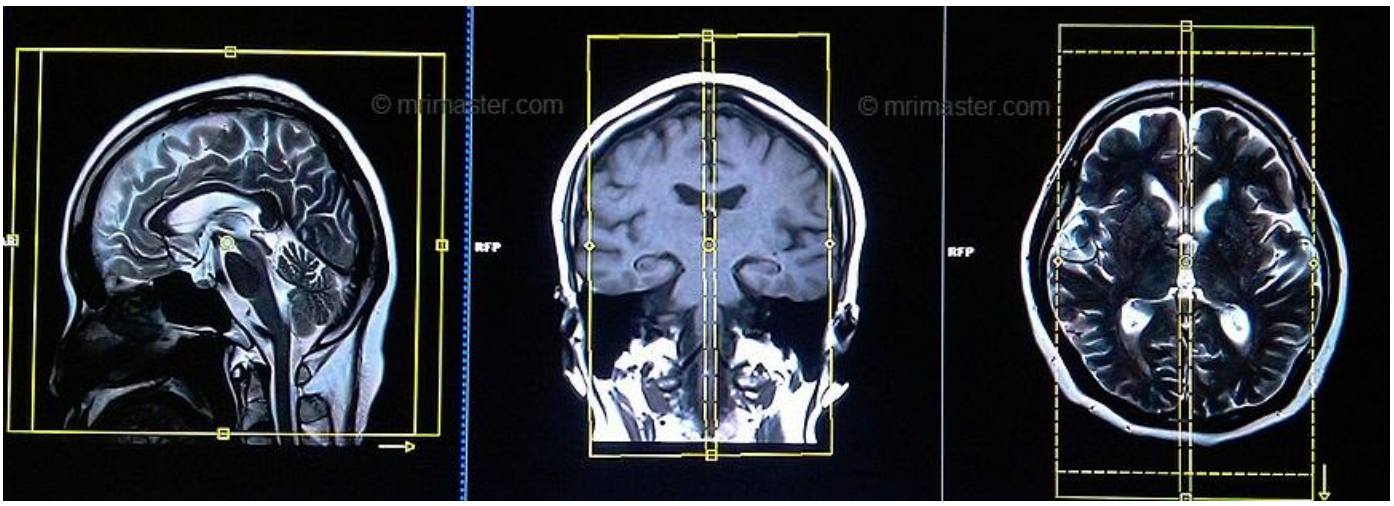


MRI HEAD MS (Multiple Sclerosis)

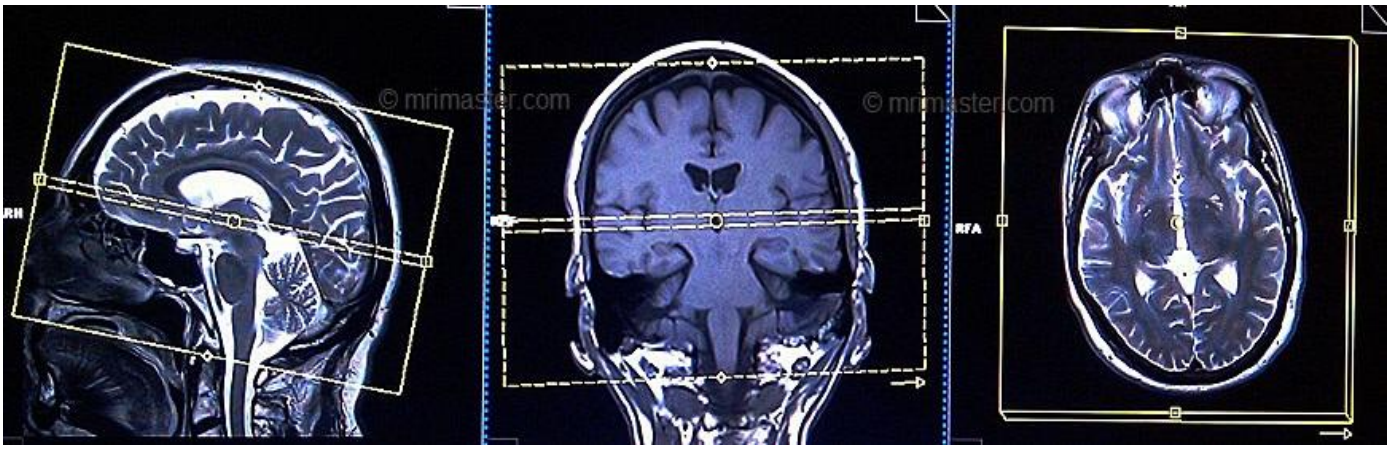
Indications: diagnosis of multiple sclerosis, demyelinating disease

Series	Note	FOV	Slice thickness	Gap
Sag T1 3D		24	1	0
Sag T2 FLAIR 3D		24	1	0
Ax T2		24	3	0
Ax DWI		24	5	1.5
Ax SWI		24		
CONTRAST				
Sag T1 GD 3D	Minimum delay 5 min	24	1	0
Reformats to PACS				
Ax FLAIR 3D			3	
Ax T1 3D			3	
Ax T1 3D post			3	

Sagittal: craniocervical junction to vertex, temporal lobes on each side, occipital to front lobes



Axial: craniocervical junction to vertex, temporal lobes on each side, occipital to front lobes



Coronal: craniocervical junction to vertex, temporal lobes on each side, occipital to front lobes

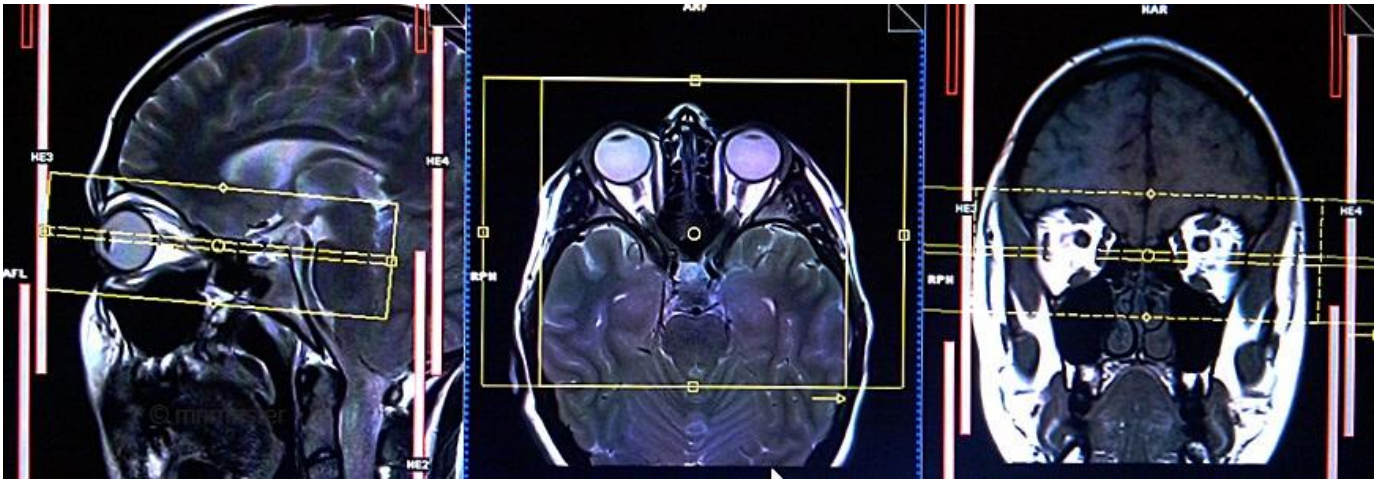
MRI Orbits

Indications: orbital lesions, proptosis, optic disc distortion, infection, inflammation, intra-ocular lesions, retinoblastoma, melanoma, vision loss, optic nerve disorders

Series	Note	FOV	Slice thickness	Gap
Sag T1	Whole head	24	5.0	1.5
Ax T2 FS	Whole head	24	5.0	1.5
Ax T2 FS **thin**		18	3.0	1
Ax T1 **thin**		18	3.0	1
Cor STIR		18	3.0	1
CONTRAST				
Ax T1 FS GD **thin**		18	3.0	1
Cor T1 FS GD **thin**		18	3.0	1

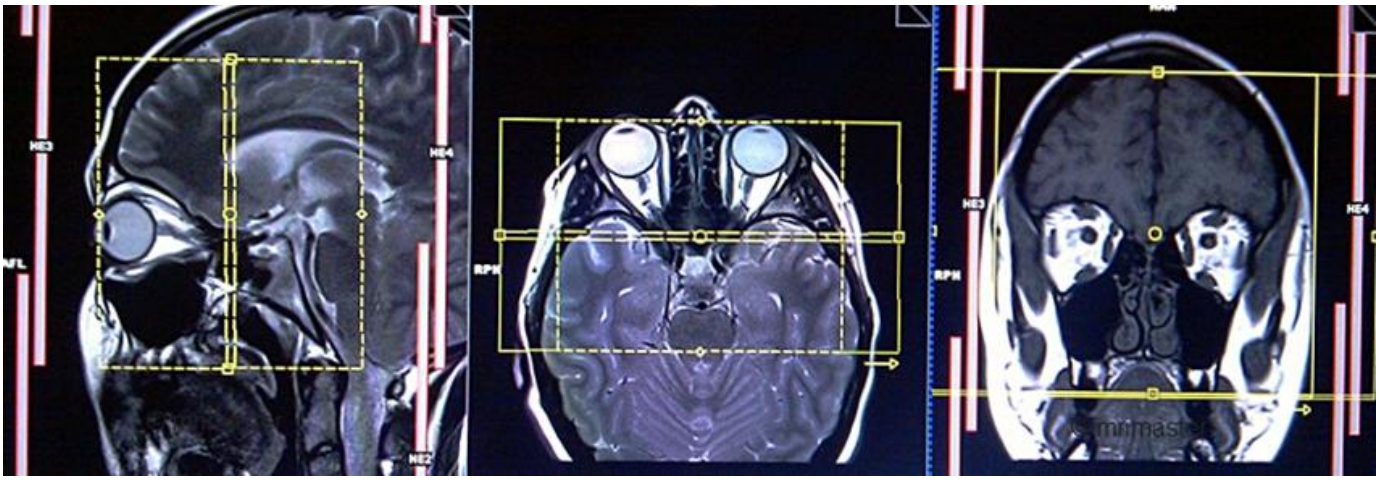
Axial Thin: parallel to line along optic nerve in sagittal and coronal views

Coverage: cover the whole orbits from eye lenses to mid pons



Coronal Thin: parallel to lenses, perpendicular to optic nerve

Coverage: cover the whole orbits from eye lenses to mid pons

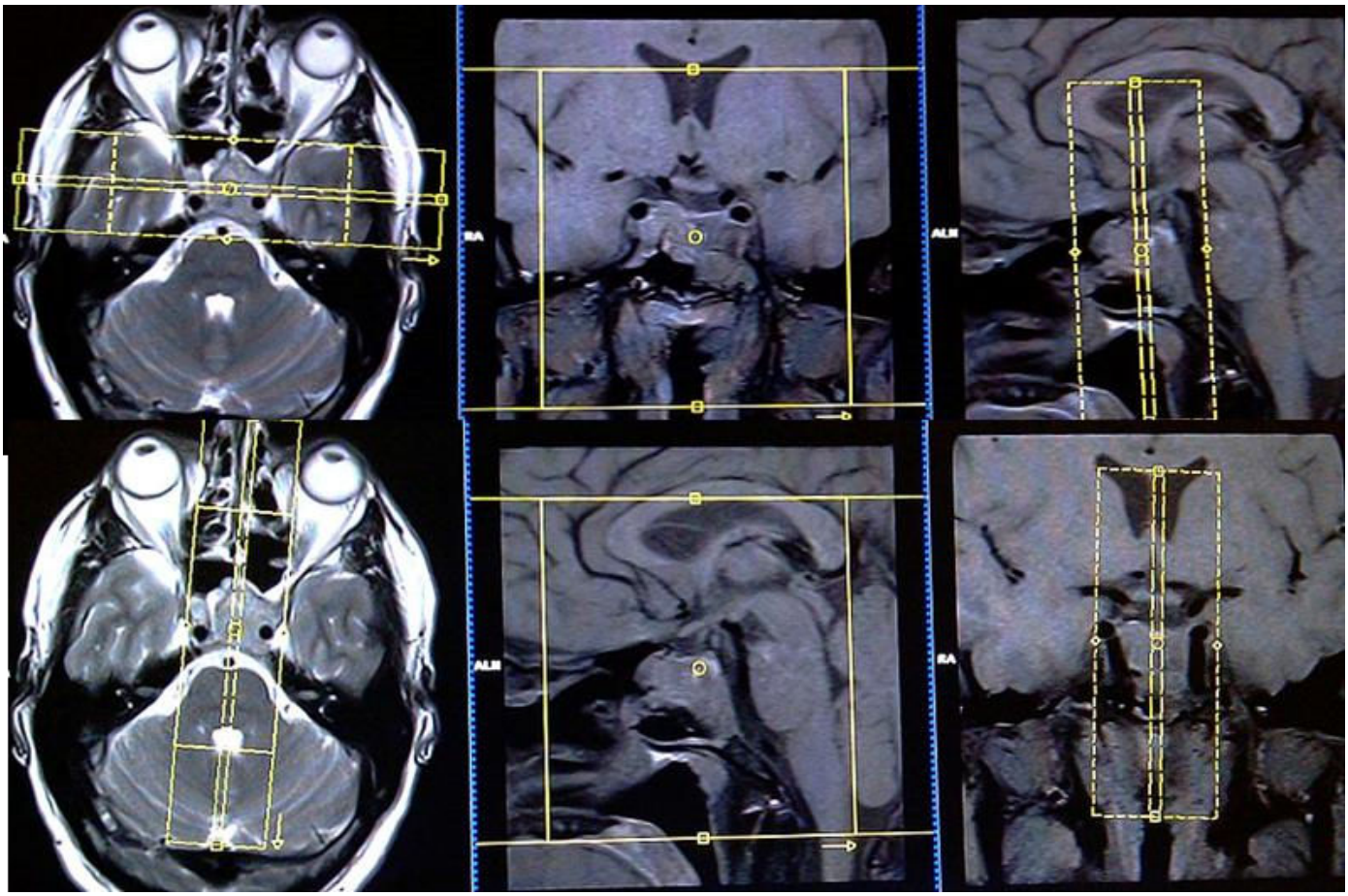


MRI Pituitary

Indications: orbital lesions, proptosis, optic disc distortion, infection, inflammation, intra-ocular lesions, retinoblastoma, melanoma, vision loss, optic nerve disorders

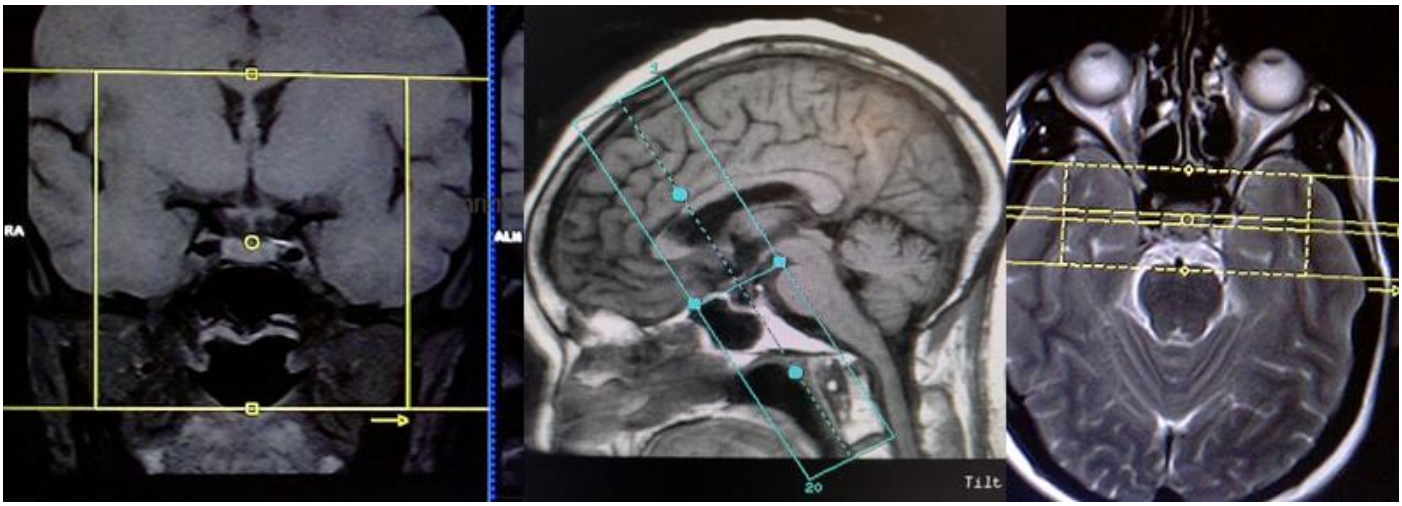
Series	Note	FOV	Slice thickness	Gap
Sag T1 FLAIR	Whole head	24	5	1.5
Sag T1 **thin**		16	2	0
Cor T2 **thin**		16	2	0
Cor T1 **thin**		16	2	0
CONTRAST				
Dynamic T1 GD	No subtraction	16		
Cor T1 GD **thin**		16	3.0	0
Sag T1 GD **thin**		16	3.0	0

Expand coverage if there is a mass:



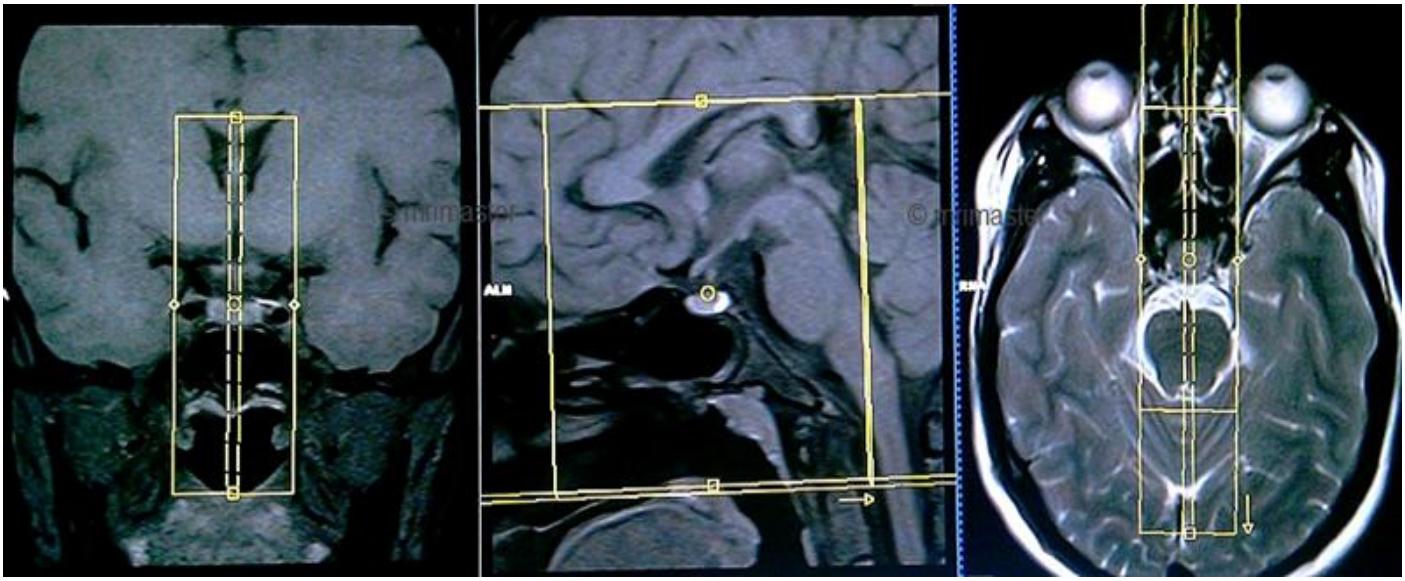
Coronal Thin: perpendicular to sella turcica

Coverage: cover whole pituitary from anterior border of sphenoid sinus to anterior pons



Sagittal Thin: parallel to falx in both coronal and sagittal planes

Coverage: cover the whole pituitary from the RT to LT internal carotid arteries



MRI Temporal Lobe

Indications: epilepsy, partial seizures, loss of seizure control, change in pattern, req by neurologist

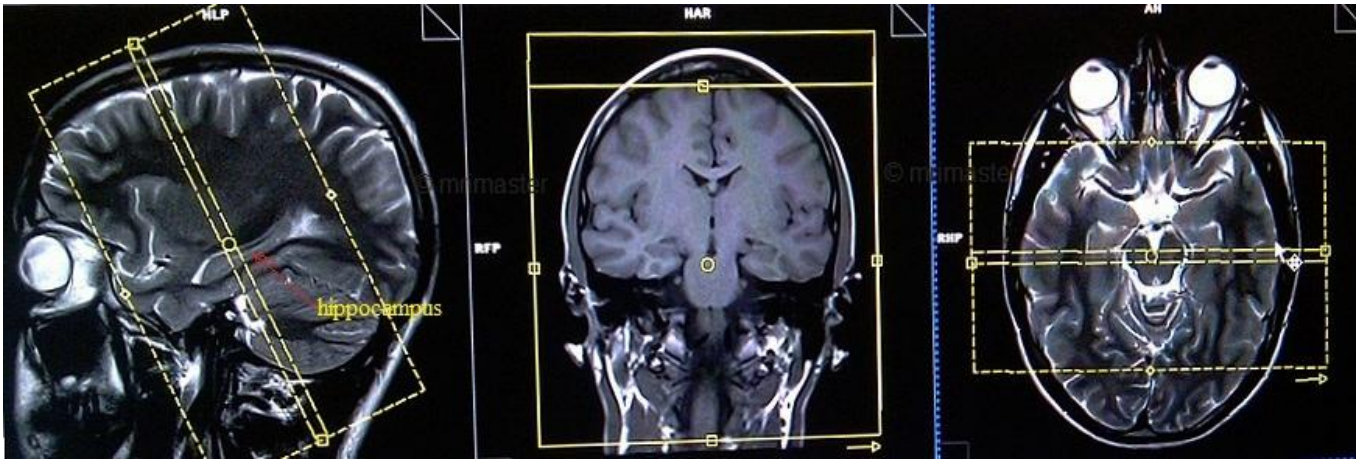
Note: NOT for new onset seizure unless specifically requested because this protocol is much longer

Series	Note	FOV	Slice thickness	Gap
Sag T1 FLAIR		24	5	1.5
Ax DWI		24	5	
Ax T2 FLAIR		24	5	1.5
Ax T2		24	5	1.5
Ax SWI		24		
Cor Obl T2 SE **thin**		3		0
Cor Obl T1 **vol**		1		0
Cor Obl T2 FLAIR **thin**		3		0
CONTRAST				
Sag T1 3D GD		24	1	0
Ax T1 SE FS GD		24	3	0
Cor T1 SE GD		18	3.0	0.3
	Reformats to PACS			
Ax T1 3D				

Coronal Oblique: Slices are perpendicular to the long axis of the hippocampus.

Appropriate angle in axial plane

Coverage: entire temporal lobe



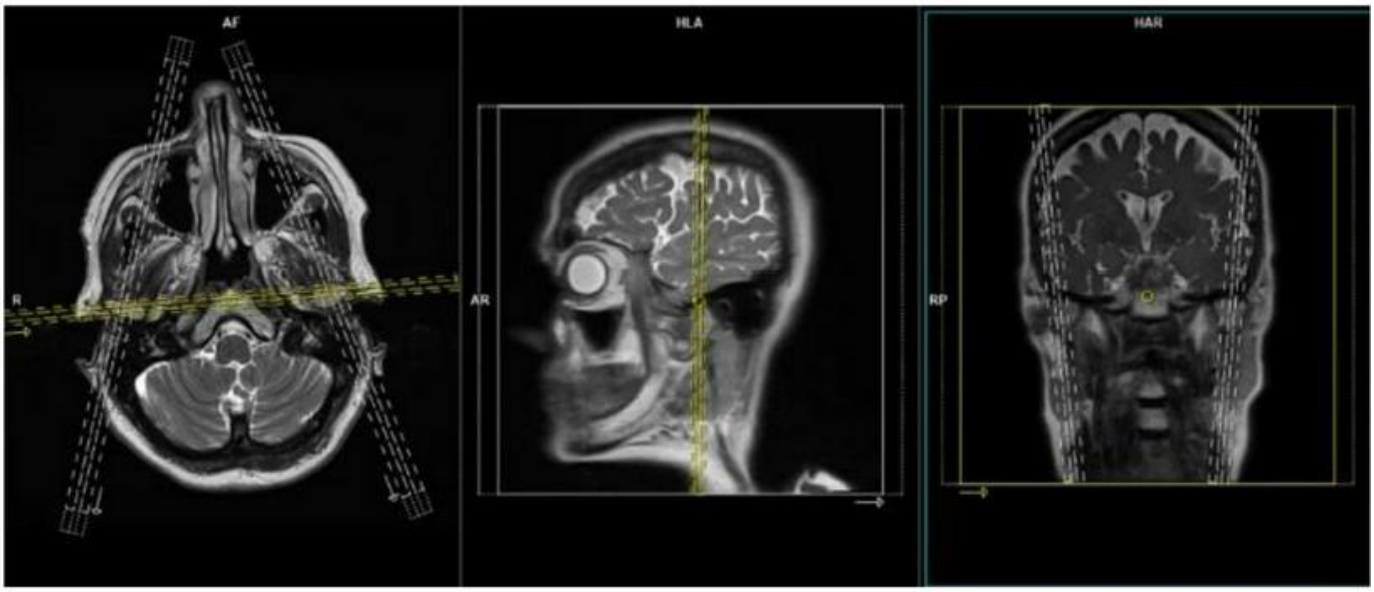
MRI TMJ

Indications: Irregular jaw movement with difficulty in opening and closing the mouth, Pain in the ear area when speaking, chewing or opening the mouth wide. Clicking sounds in the jaw joint when opening or closing the mouth, Difficulty in chewing, Ear pain in front of or below the ear without any signs of infection

Series	Note	FOV	Slice thickness	Gap
Closed Mouth				
Ax T2	Cover both at skull base	20	3	0.3
Sag PD	Bilateral	14	3	0.3
Sag T2 FS	Bilateral	14	3	0.3
Cor T1	Cover Both	20	3	0.3
Open Mouth				
Sag PD	Bilateral	14	3	0.3
CONTRAST				
Sag T1 FS	Bilateral	14	3	0.3
Cor T1 FS	Cover Both	20	3	0.3

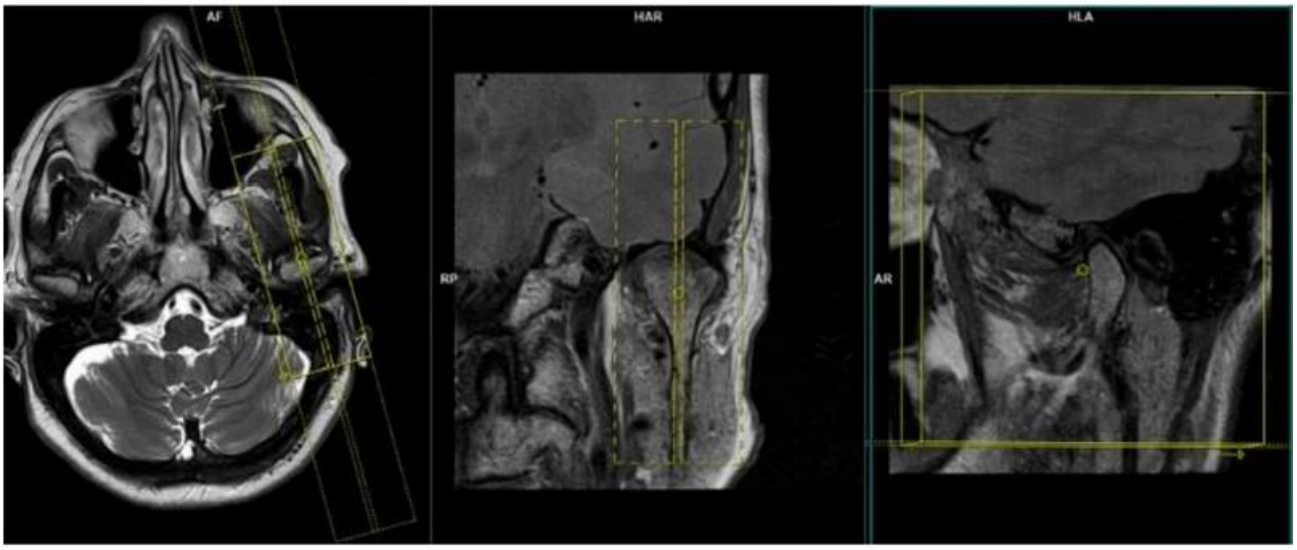
To perform open mouth scans, a bite block must be placed in the patient's mouth. The bite block should be big enough to keep the mouth wide open. If a bite block is not available, a large 50 mL syringe can be used.

Localizer Setup



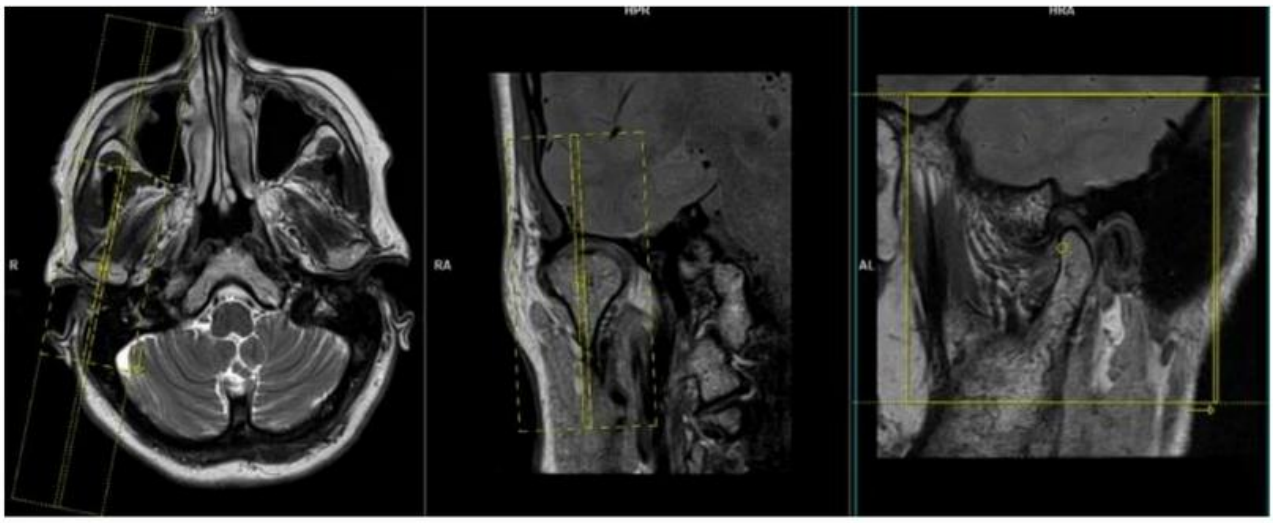
Sagittal Left

Plan the left side sagittal slices on the axial plane; angle the planning block perpendicular to the left condyle of the mandible. Check the planning block in the other two planes. An appropriate angle must be given in the coronal plane (parallel to the line along the left temporal bone and ramus of the mandible). The slices should adequately cover the left temporomandibular joint (TMJ) from one side to the other.



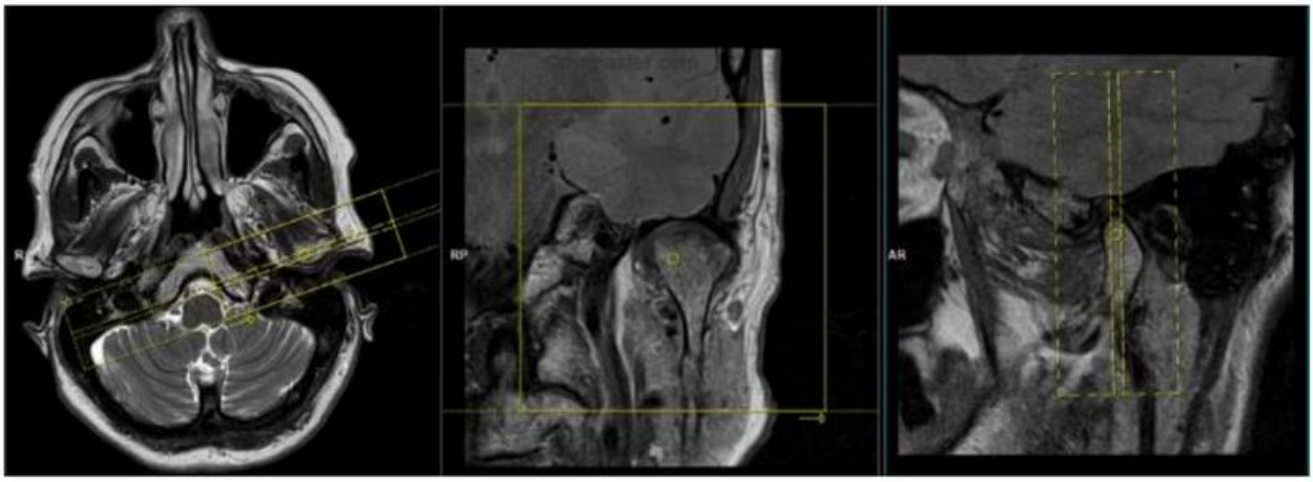
Sagittal Right

Plan the right side sagittal slices on the axial plane; angle the planning block perpendicular to the right condyle of the mandible. Check the planning block in the other two planes. An appropriate angle must be given in the coronal plane (parallel to the line along the right temporal bone and ramus of the mandible). The slices should adequately cover the right temporomandibular joint (TMJ) from one side to the other.



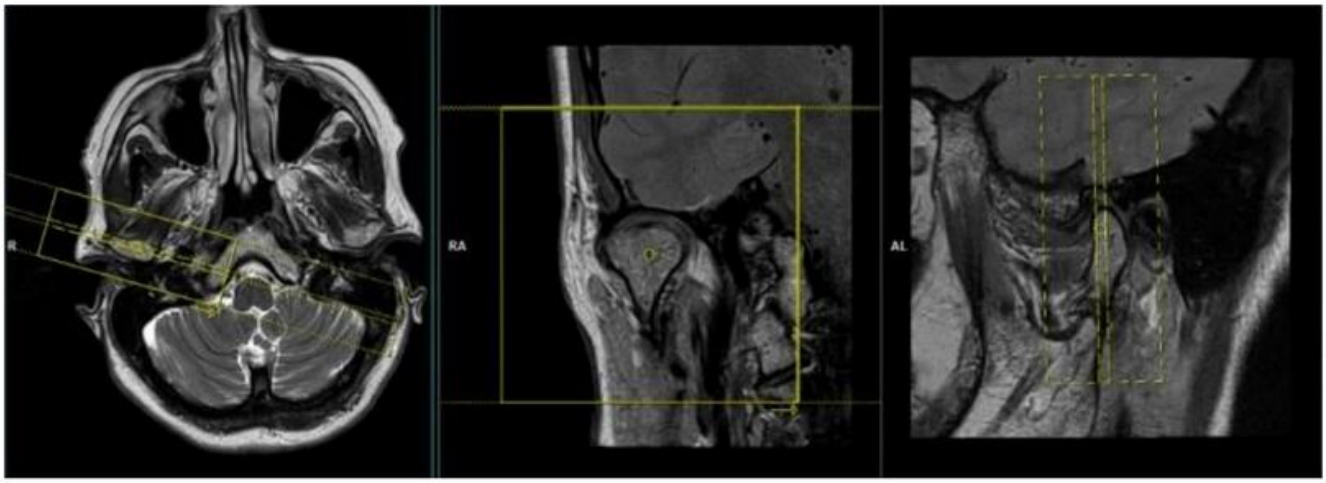
Coronal Left

Plan the left side coronal slices on the axial plane; angle the planning block parallel to the left condyle of the mandible. Check the planning block in the other two planes. Ensure an appropriate angle is given in the sagittal plane, parallel to the line along the ramus and left mandibular condyle. The slices must be sufficient to cover the left temporomandibular joint (TMJ) from the articular eminence up to the line of the internal auditory meatus.



Coronal Right

Plan the right side coronal slices on the axial plane, and angle the planning block parallel to the right condyle of the mandible. Check the planning block in the other two planes. An appropriate angle must be given in the sagittal plane (parallel to the line along the ramus and right mandibular condyle). Ensure that the slices are sufficient to cover the right temporomandibular joint (RT TMJ) from the articular eminence up to the line of the internal auditory meatus.



MRI FACE

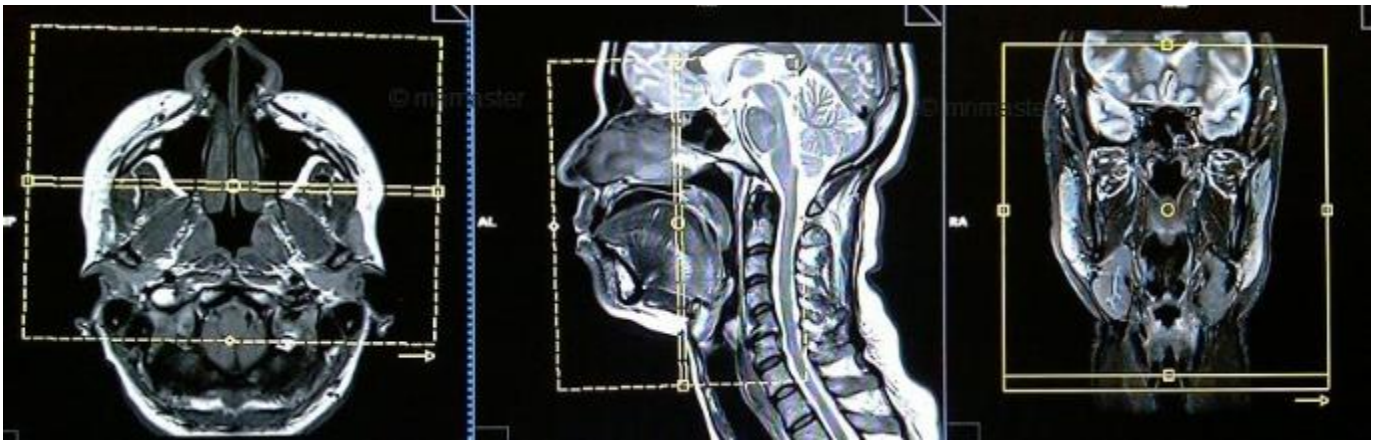
PROTOCOL FORM MUST BE COMPLETED BY RAD PRIOR TO EXAM

Indications: tumor, abscess, infection

Series	Note	FOV	Slice thickness	Gap
Cor Stir		18	3	0
Cor T1		18	3	0
Ax T2 FS		18	3	0
Ax T1		18	3	0
Sag T1	Optional per rad	18	3	0
Ax DWI		18	3	0
CONTRAST				
Ax T1 FS GD		18	3	0
Cor T1 FS GD		18	3	0
Sag T1 FS GD	Optional per rad	18	3	0

Coronal: perpendicular to hard palate on sagittal, perpendicular to septum on axial.

Coverage: Tip of nose to fourth ventricle

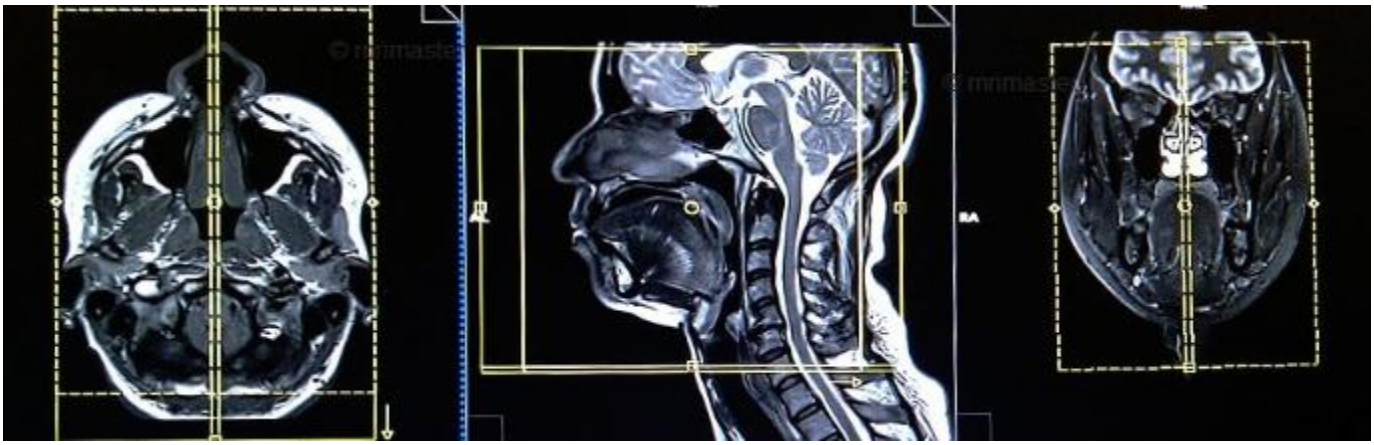


Axial: parallel to hard palate on sagittal, perpendicular to septum on coronal

Coverage: glabella down through larynx

Sagittal: parallel to hard palate on axial, perpendicular to septum on coronal.

Coverage: pinna to pinna



MRI NECK

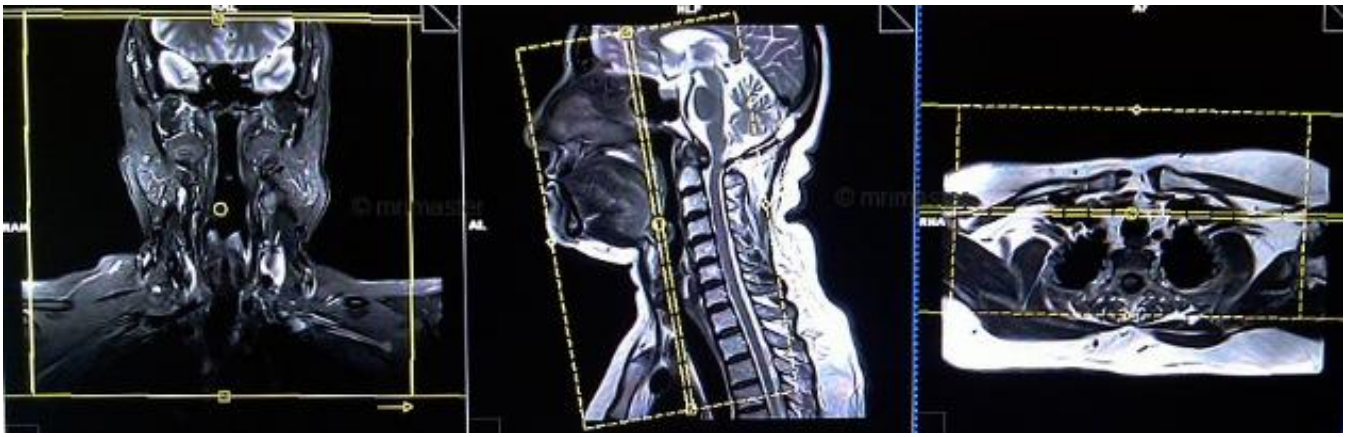
PROTOCOL FORM MUST BE COMPLETED BY RAD PRIOR TO EXAM

Indications: tumor, abscess, infection, thyroid

Series	Note	FOV	Slice thickness	Gap
Cor STIR		24	4	0
Cor T1		24	4	0
Ax T2 FS		18	4	0
Ax T1		18	4	0
Sag T1	Optional per rad	24	4	0
Ax DWI		18	4	0
CONTRAST				
Ax T1 FS GD		18	4	0
Cor T1 FS GD		24	4	0
Sag T1 FS GD	Optional per rad	24	4	0

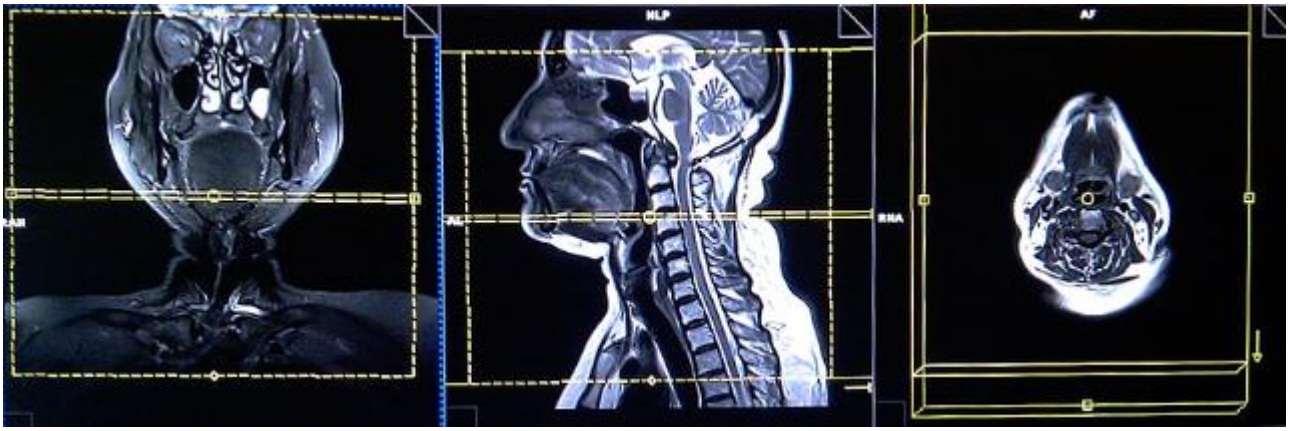
Coronal: parallel to cervical sagittal, check other planes.

Coverage: EAM to EAM, frontal sinus to clavicles/apices



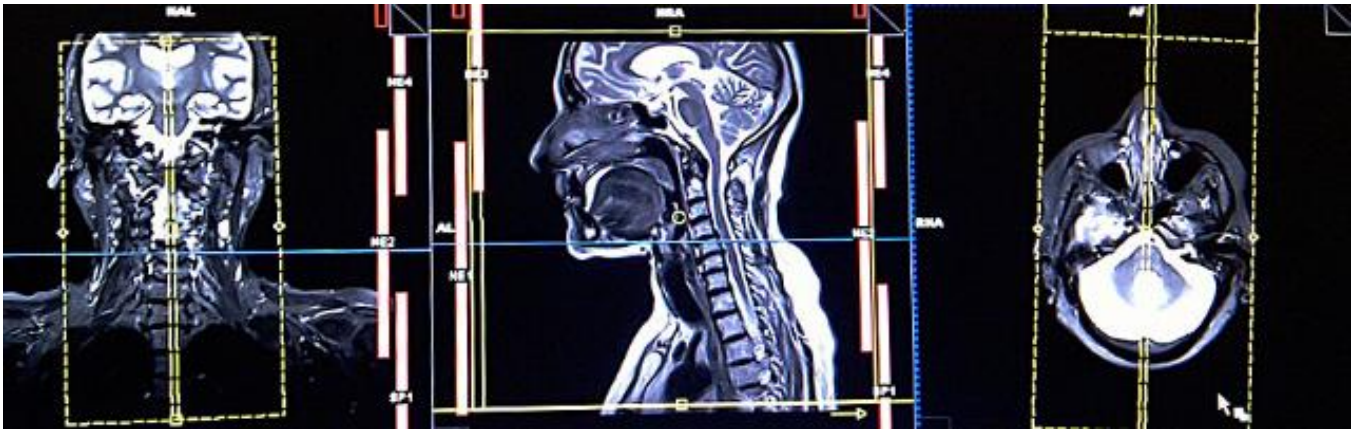
Axial: perpendicular to cervical on axial, check other planes

Coverage: frontal sinus to clavicles



Sagittal: parallel to cervical on coronal, check other planes

Coverage: pinna to pinna



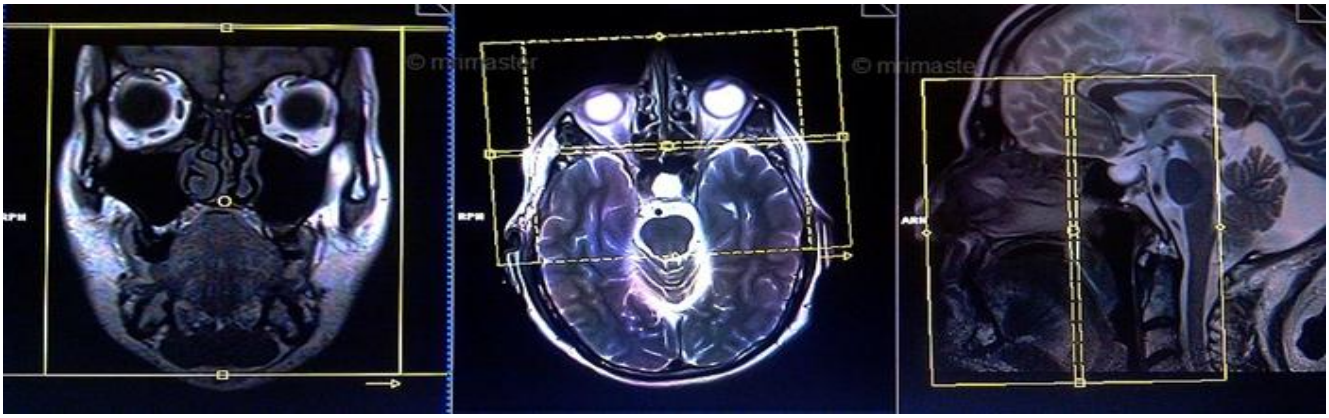
MRI HEAD - Trigeminal

Indications: trigeminal neuralgia, facial pain +/- facial spasm, mass, neuroma, infection

Series	Note	FOV	Slice thickness	Gap
Sag T1	Whole head	24	5	1.5
Ax DWI	Whole head	24	5	1.5
Ax T2	Whole head	24	5	1.5
Ax T2 FLAIR	Whole head	24	5	1.5
Ax T1 SE	Whole head	24	5	1.5
Ax T2 3D	Cranial nerves Fiesta, CISS, or T2 Drive	18	0.8	0
CONTRAST				
Sag T1 GD 3D	Whole head Include both ears	24	1	0
Ax T1 FS GD **thin**	Cranial nerves	18	3.0	0.3
Cor T1 FS GD **thin**	Cranial nerves	18	3.0	0.3
Reformats to PACS				
Cor T2 **thin**			1	0
Sag T2 **thin**			1	0
Ax T1 3D			1	0
Cor T2 3D			1	0

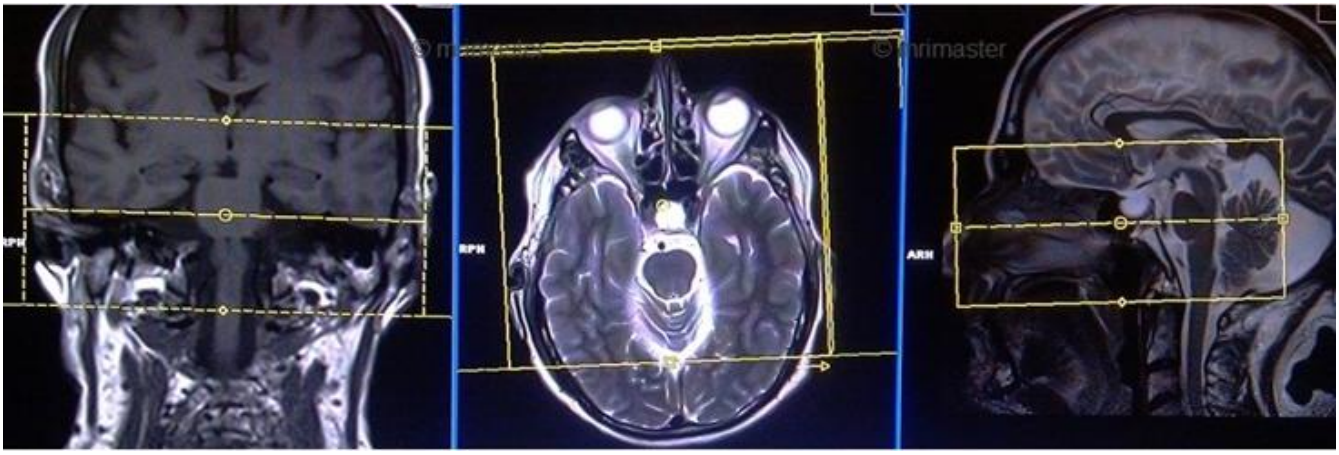
Coronal Thin: parallel to the brainstem / perpendicular to nasal septum.

Coverage: Pons to nose, including sinuses and mandible



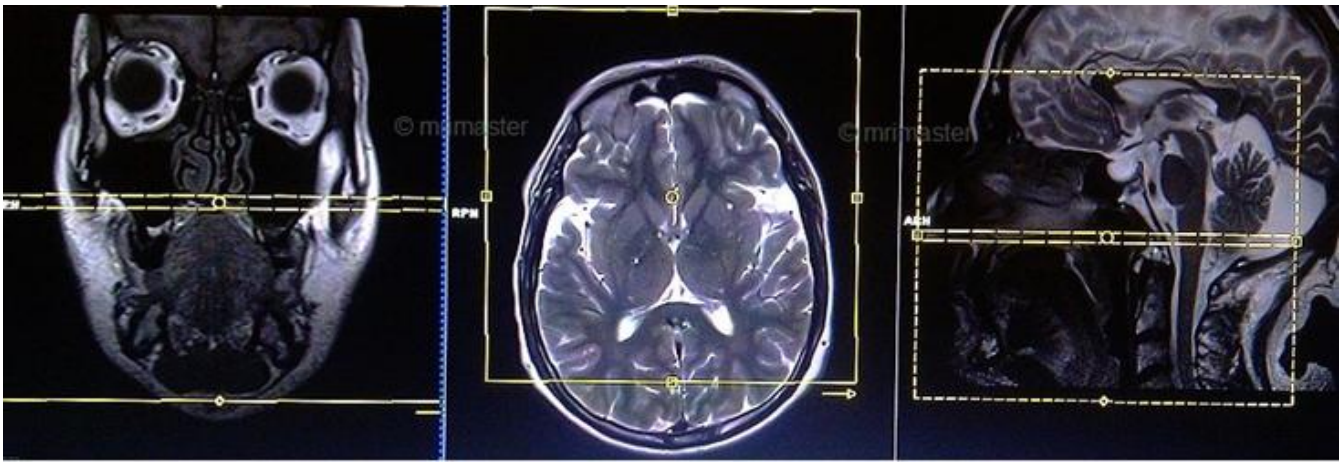
Axial Fiesta: perpendicular to brainstem, parallel to hard palate

Coverage: glabella down through hard palate



Axial Thin: perpendicular to brainstem, parallel to hard palate.

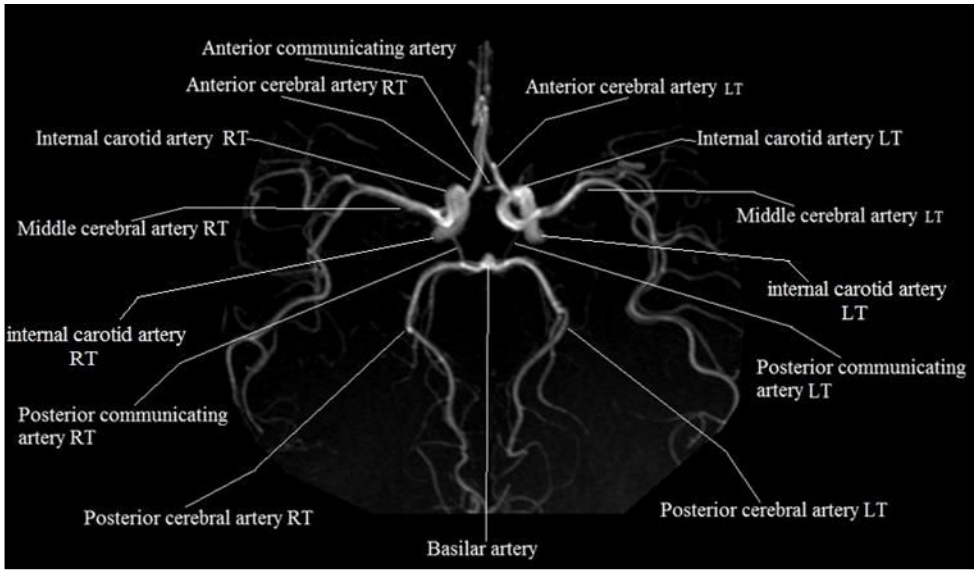
Coverage: glabella down to angle of jaw

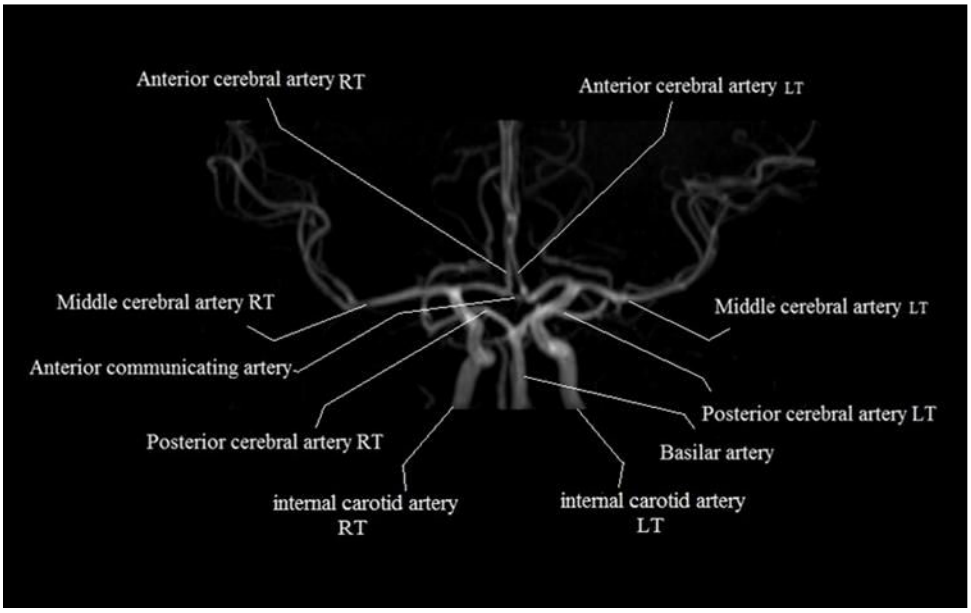


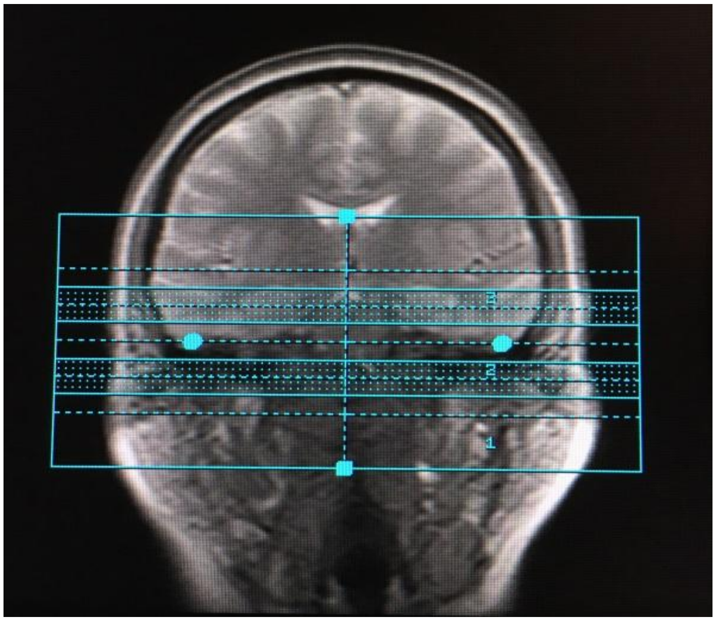
MRA HEAD

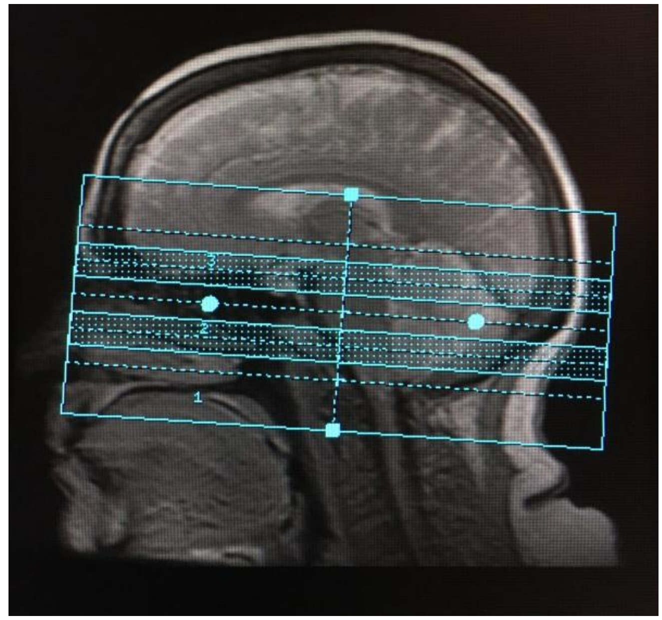
Indications: aneurysm, stroke, vasospasm, vasculitis, internal carotid artery occlusion or stenosis, AVM, cerebral or basilar artery occlusion & stenosis, atherosclerotic disease

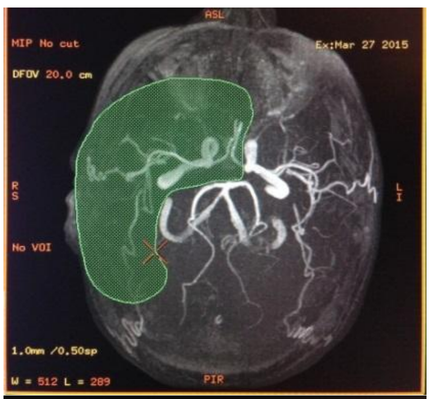
Series	Note	FOV	Slice thickness	Gap
3D TOF SLAB MT FS		24		
CONTRAST				
3D TOF SLAB MT FS		24	1	0
Reformats to PACS				
Entire COW				
Right Anterior				
Left Anterior				
Posterior				

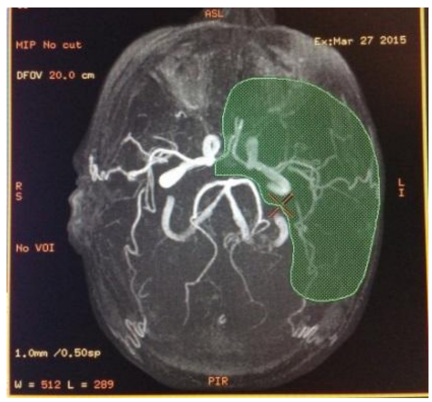









ASL
MIP No cut
Ex:Mar 27 2015
DFOV 20.0 cm
No VOI
1.0mm /0.50sp
W = 512 L = 289
PIR


ASL
MIP No cut
Ex:Mar 27 2015
DFOV 20.0 cm
No VOI
1.0mm /0.50sp
W = 512 L = 289
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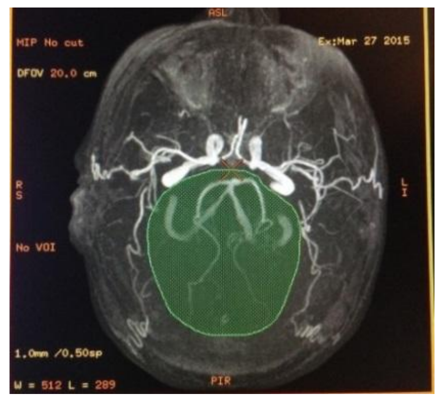

ASL
MIP No cut
Ex:Mar 27 2015
DFOV 20.0 cm
No VOI
1.0mm /0.50sp
W = 512 L = 289
PIR


Right


Left

Contents

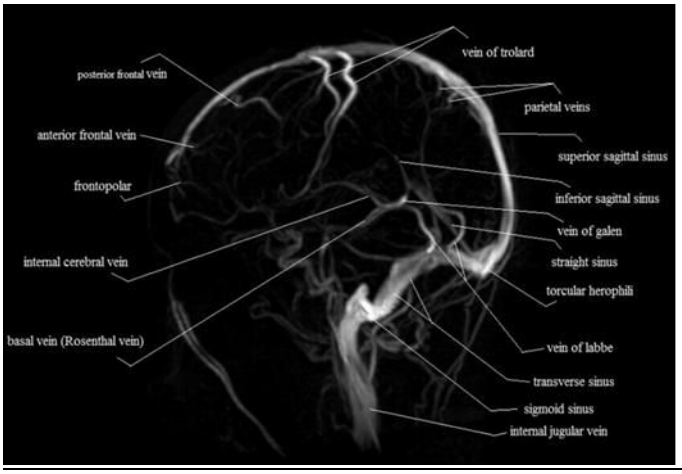
MRV Head

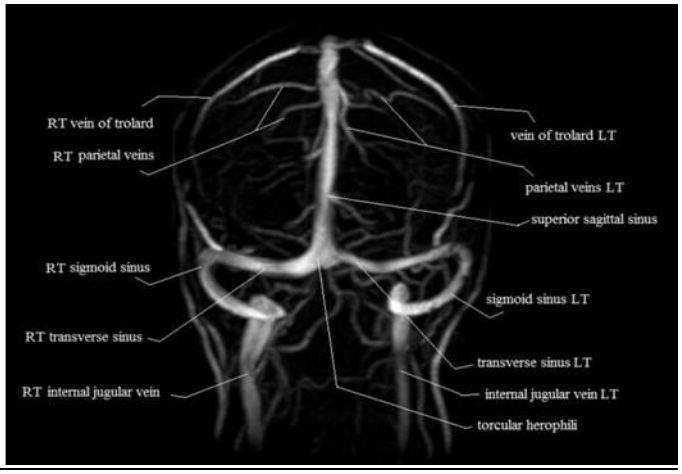
Indications: thrombosis, pregnancy, non contrast

Series	Note	FOV	Slice	Gap
Sag T1 Flair (whole head)		24	5.0	1.0
Sag 2D PC (Midline)		20	30	
Cor 2D TOF		20	1.5	
Sag 2D TOF		23	1.5	
Post Processing				
Rotate TOF				
Tumble TOF				

Indications: thrombosis

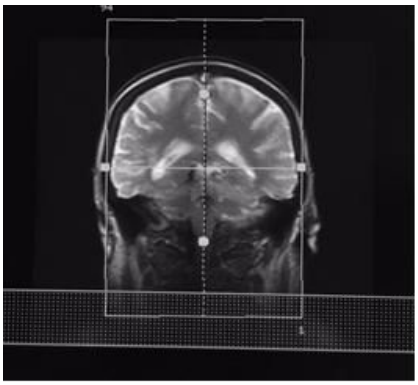
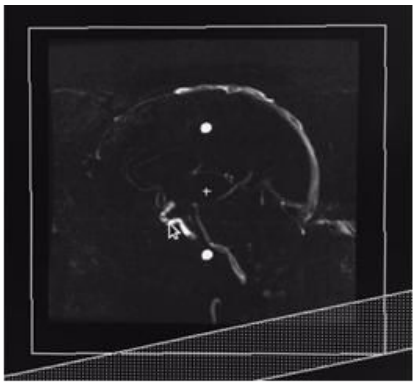
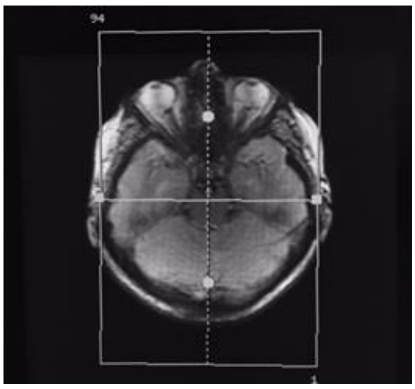
Series	Note	FOV	Slice	Gap
Sag T1 Flair (whole head)		24	5.0	1.0
Cor SPGR		24	1.2	
CONTRAST				
Cor SPGR GD		24	1.2	
Cor SPGR GD repeat immediately		24	1.2	
Post Processing				
Rotate TOF				
Tumble TOF				





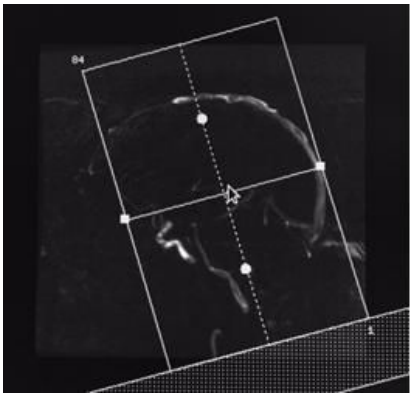
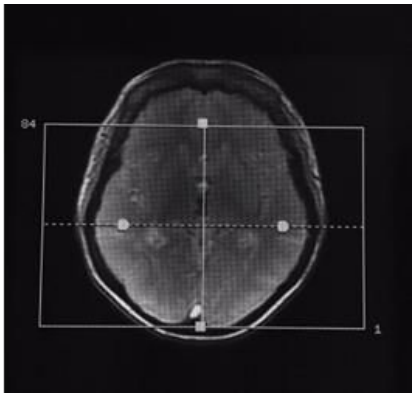
Sag T2 TOF: straight sagittal, inferior sat band below anatomy

Coverage: whole brain from temporal lobe to temporal lobe

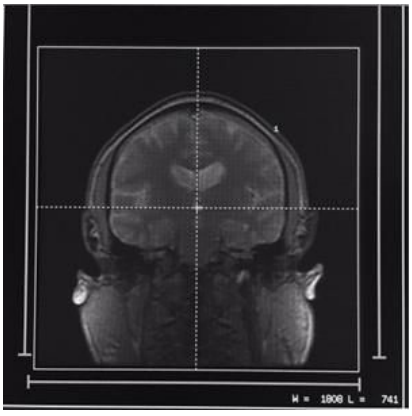
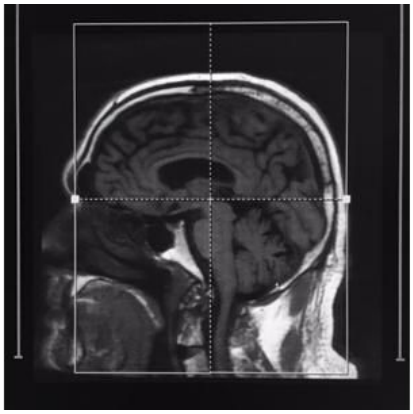
Cor T2 TOF: angle coronal on sagittal image to include all venous anatomy, check other planes

Coverage: all venous anatomy

Cor SPGR: straight coronal, check axial plane and angle if necessary for true coronal

Coverage: whole brain

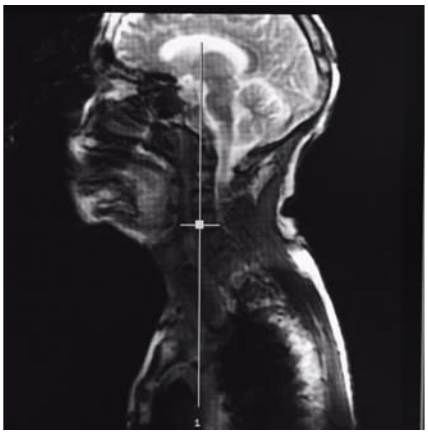
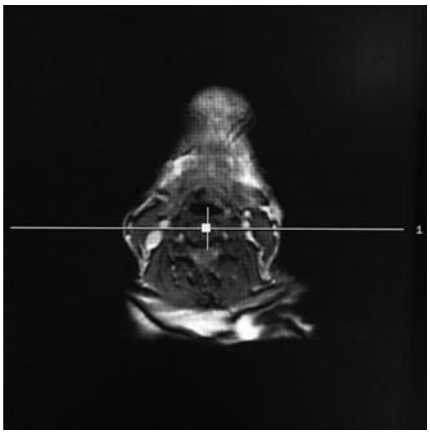

MRA Neck / Carotid

Indications: dissection, aneurysm, AVM, congenital abnormalities, injury, tumor

Series	Note	FOV	Slice thickness	Gap
COR PD PC		28	30	0
SAG PD PC		28	30	0
3d TOF SLAB		18	1.6	0
T1 Ax FS	For dissection	20	5	0.3
CONTRAST				
Cor ceMRA		30	1.4	0
	Reformats to PACS			
Bilateral Carotids	Twirl			
Right Carotid	Twirl			
Left Carotid	Twirl			
Aortic arch	Twirl			
Bifurcation right	Twirl			
Bifurcation left	Twirl			

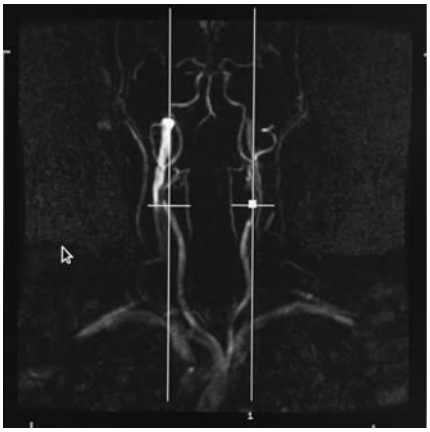
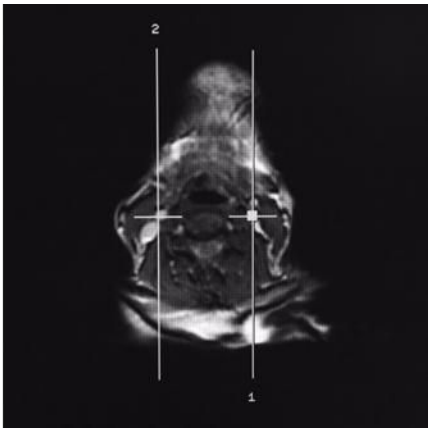
Coronal 2D PC: parallel to carotid arteries on axial view.

Coverage: center on vessels

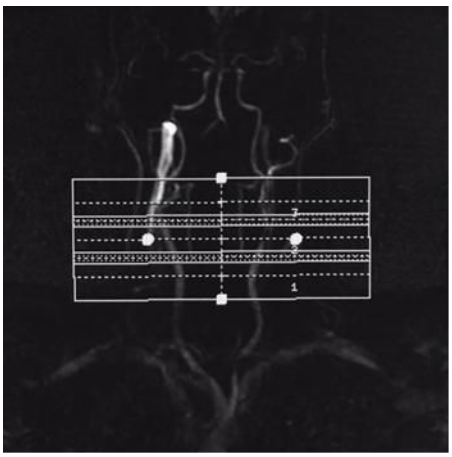
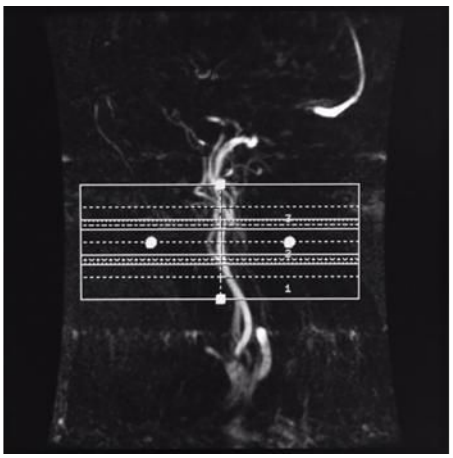
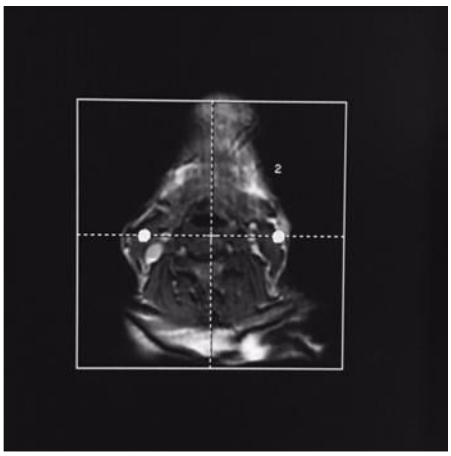




Sag 2D PC: parallel to carotid arteries on coronal view

Coverage: center on vessels, keep slabs on same level S/I and A/P

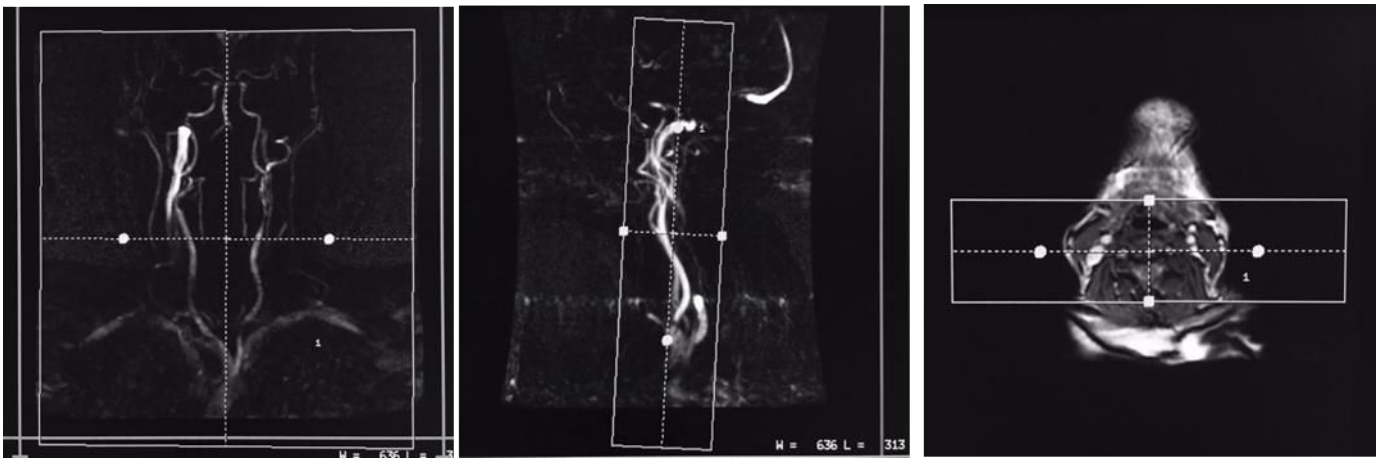



3D TOF 3 SLAB: use prior two scans to set up box centered on bifurcation of carotids.

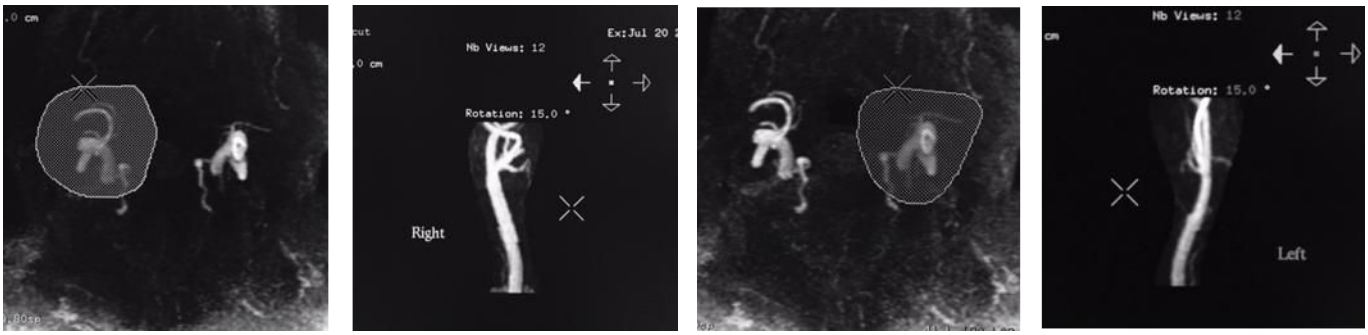




Coronal ceMRA FT elliptic: coronal to long axis of carotid vessels, may be obliqued depending on curvature.

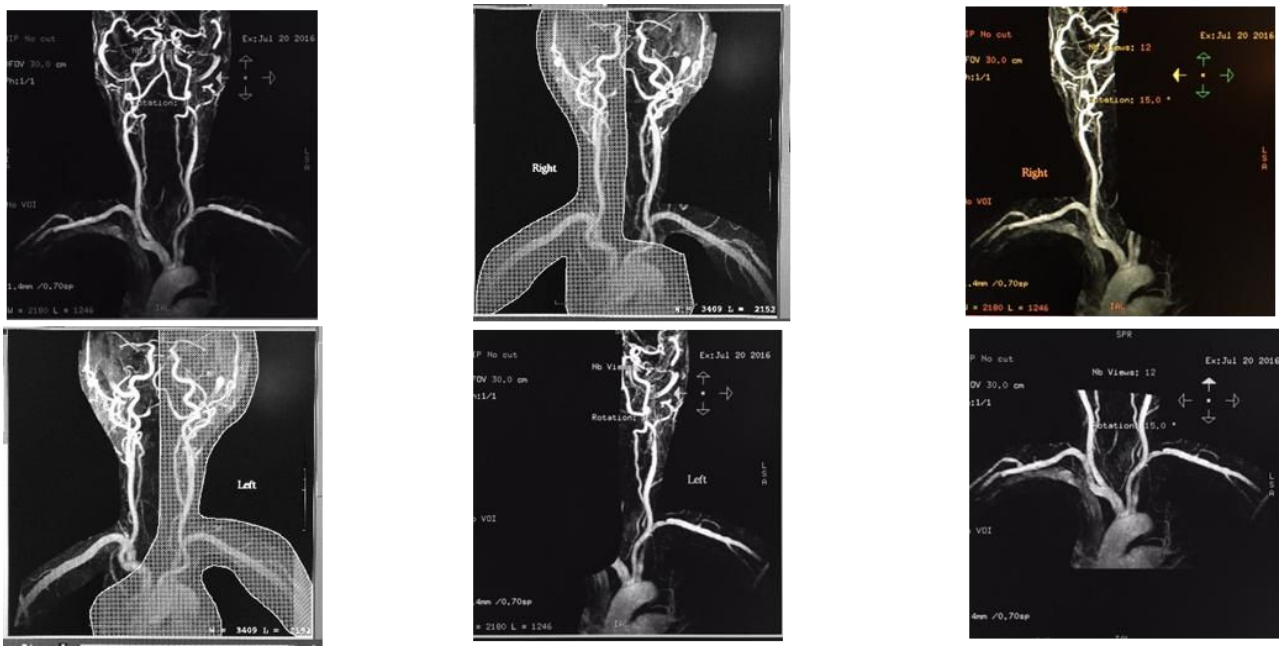
Coverage: aortic arch to COW



Bifurcation: save screenshot and sent to PACS



Carotids: choose subtracted images for IVI of carotid but do not select image 1



Contents

MRI Brachial Plexus

Please reference protocol in MRI Spine document