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MRI Neuro Adult Brain and ENT Protocols

Version 3.6 (March 2025)

Version Updates

Version 3.3 Update June 2024

1. Updated the look and format of the document
2. Added Version updates (page 2)
3. Brain-epilepsy chronic seizures protocol, added Axial FSPGR sequences
4. MRV Head without, updated comments to remove Venc parameters, added Sag 3D phase contrast (line 6) reference https://mrimaster.com/mrv-brain/, updated Sag 3D postcontrast (line 4) Removed Sag 2d Phase Contrast and Cor Obl 2D TOF series
5. Brain-CSF Flow study, updated flow times to 20cm/s from 2cm/s reference: https://pubs.rsna.org/doi/pdf/10.1148/rg.2020190039
6. MRI IACs WO and W, updated Seq column from DWI to DWI non-echoplanar and changed thickness to 2mm. reference: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5028345/
7. TMJ Protocols, Series 1 Axial T2 changed to T1. Removed Sag GRE series. Changed series 3 & 6 from Sag T1 to Sag PD.

Version 3.4 Update August 2024

1. Page 4-Brain without, changed Line 1 Series to from FSPGR to Sag T1, changed thickness to 4mm gap to 1mm, FOV to 24cm, removed comments.
2. Page 5-Brain without and with, Added Axial T1 series, now line 2.
3. Page 5-Brain without and with, Changed Line 8 from Sag to Axial and updated comment from axial recon to sag recon.
4. Page 6 -Brain without and with Pediatric 0-18mths, Changed Line 1 from Sag to Axial and updated comment from axial recon to sag recon.
5. Page 6 -Brain without and with Pediatric 0-18mths, Changed Line 8 from Sag to Axial and updated comment from axial recon to sag recon.
6. Page 7-Brain without and with Pediatric Greater than 18mths, Changed Line 1 from Sag to Axial and updated comment from axial recon to sag recon.
7. Page 7-Brain without and with Pediatric Greater than 18mths, Changed Line 8 from Sag to Axial and updated comment from axial recon to sag recon.
8. Page 8-Brain without and with Multiple Sclerosis, Changed Line 8 from Sag to Axial and updated comment from axial recon to sag recon.
9. Page 9-Brain without Epilepsy, Changed Line 1 from Sag to Axial and updated comment from axial recon to sag recon.
10. Page 9-Brain without Epilepsy, Changed Line 4 from Axial FSPGR to FLAIR.
11. Page 16-MRV head without, Changed Line 2 from Sag Obl 2D TOF MRV to read Sag 3d TOF MRV midline
12. Page 16-MRV head without, Changed Line 3 from Sag Obl 2D TOF MRV to read Sag 3d TOF MRV offset
13. Page 23-ENT Screening Neck, Changed all slice thicknesses to 4mm and all gaps to 1mm.

Version 3.5 Update November 2024

1. Page 18-ENT IAC, Changed Line 8 from Axial T1 series to Axial Bravo. Updated slice thicknesses to 2mm and gap to 0mm.
2. Page 20-ENT-Sella Initial, changed fat sat to no for the post contrast coronal T1 series, Line 9.
3. Page 21-ENT Sella Follow up, changes fat sat to no for the post contrast coronal T1 series, Line 9.

Version 3.6 Updated March 2025

1. Page 5 BRAIN - ROUTINE WITHOUT CONTRAST Line 5 axial SWI (or GRE), changed slice thickness to 2 mm (was 4 mm).
2. Page 6 BRAIN – ROUTINE WITHOUT AND WITH CONTRAST Line 5 axial SWI (or GRE), changed slice thickness to 2 mm (was 4 mm).
3. Page 7 BRAIN – PEDIATRIC 0-18 MONTHS OF AGE, Line 5 axial SWI, changed slice thickness to 2 mm (was 3 mm).
4. Page 8 BRAIN – PEDIATRIC GREATER THAN 18 MONTHS, Line 5 axial SWI, changed slice thickness to 2 mm (was 4 mm).
5. Page 9 BRAIN – MULTIPLE SCLEROSIS, added line 2 sequence: Axial T1.
6. Page 9 BRAIN – MULTIPLE SCLEROSIS, Line 5, axial SWI, changed slice thickness to 2 mm, (was 4mm).
7. Page 10 BRAIN – EPILEPSY, CHRONIC SEIZURES, line 5 axial SWI, changed slice thickness to 2 mm (was 4mm).
8. Page 11 Orbits, line 1 Cor STIR, changed contrast column to "N."
9. Page 11 Orbits, added line 4 sequence Axial T2.
10. Page 19 ENT – IAC, line 4 axial SWI, changed slice thickness to 2 mm (was 4mm).
11. Page 21 ENT – SELLA, INITIAL EVALUATION, line 4 axial SWI, changed slice thickness to 2 mm (was 4 mm).
12. Page 21 ENT – SELLA, INITIAL EVALUATION, line 9 Coronal T1 postcontrast changed the comment to Dynamic: 4 measurements, (was 18 measurements).
13. Page 22 ENT – SELLA, FOLLOW-UP EVALUATION, line 4 axial SWI, changed slice thickness to 2 mm. (was 4mm)
14. Page 21 ENT - SELLA, FOLLOW-UP EVALUATION, Line 9 Coronal T1 postcontrast DYNAMIC changed the comment to: "Dynamic; 4 measurements" (was 18 measurements)
15. Page 22 ENT – SELLA, FOLLOW-UP EVALUATION, line 4 axial SWI, change slice thickness to 2 mm (was 4 mm). Line 9 Coronal T1 postcontrast change the comment to "Dynamic: 4 measurements, not required if patient has a known pituitary macroadenoma"
16. Page 23 ENT – SKULL BASE AND TRIGEMINAL NEURALGIA. Added a new sequence, Axial SWI. Line 4.
17. Page 23 ENT – SKULL BASE AND TRIGEMINAL NEURALGIA Line 8 3D T2 changed comment to: "CISS/SPACE/FIESTA, if none of these available, consider sending patient to different facility."

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NOTE:

Please name all sequences and protocols as described herein.

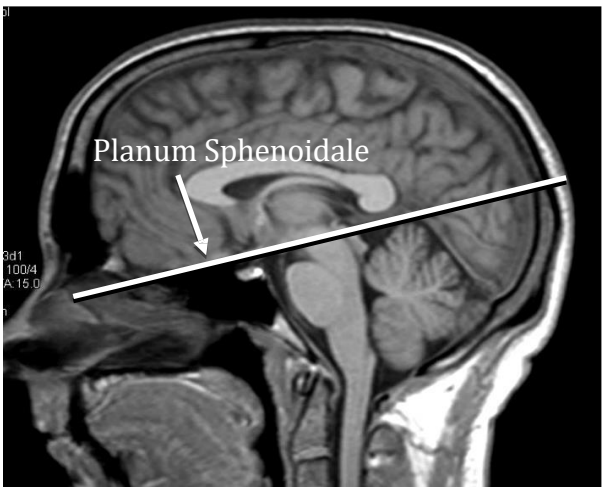
SEQUENCES

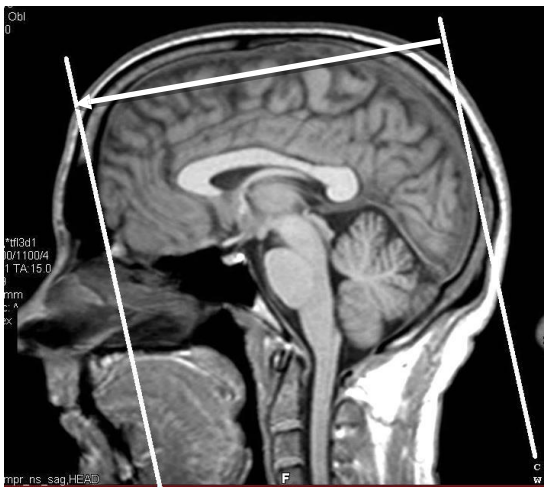
BRAIN - ROUTINE WITHOUT CONTRAST

PACS Description: MRI Brain WO

Indications – Stroke, acute mental status changes, memory loss, non-focal symptoms.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	FLAIR	N	N	4mm	1mm	24cm	BottomUp	
5	Axial	SWI (or GRE)	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred
6	Axial	T1	N	N	4mm	1mm	24cm	BottomUp	
7	Cor	T2	N	N	4mm	1mm	24cm	A to P	





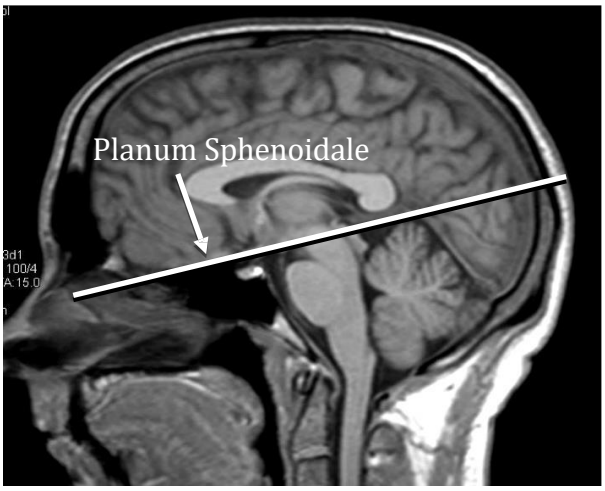
Position: Axial images should be parallel to the planum sphenoidale and the hard palate and cover the entire brain (including the scalp at the vertex and through the foramen magnum inferiorly). Coronal and sagittal images can be aligned perpendicular to the axial slices and should include the entire brain.

BRAIN – ROUTINE WITHOUT AND WITH CONTRAST

PACS Description: MRI Brain WO and W

Indications – Metastatic disease, infection, inflammation, new seizure in adults, headache in adults.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	T1	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
5	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
POST-CONTRAST									
6	Axial	FLAIR	Y	N	4mm	1mm	24cm	BottomUp	
7	Axial	T1	Y	N	4mm	1mm	24cm	BottomUp	
8	Axial	FSPGR	Y	N	2mm	0mm	25.6cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.
OPTIONAL SEQUENCES IF NEW/DE NOVO TUMOR									
9	Cor	FLAIR	N	N	4mm	1mm	24cm	A to P	If new onset seizures. Align to hippocampus.
10	DTI								
11	Perfusion								
12	Spectroscopy								



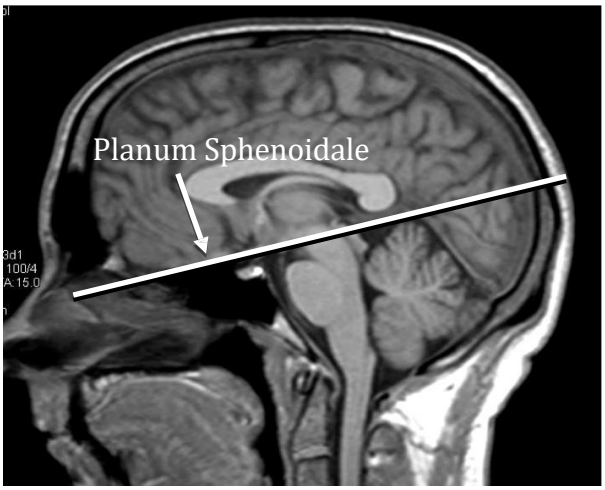
Position: Axial images should be parallel to the planum sphenoidale and the hard palate and cover the entire brain (including the scalp at the vertex and through the foramen magnum inferiorly). Coronal and sagittal images can be aligned perpendicular to the axial slices and should include the entire brain.

BRAIN – PEDIATRIC 0-18 MONTHS OF AGE

PACS Description: MRI Brain WO and W

Indications – Metastatic disease, infection, inflammation, new seizure, headache.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Axial	FSPGR	N	N	1mm	0mm	20cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.
2	Axial	T2	N	N	3mm	1mm	20cm	BottomUp	
3	Axial	FLAIR	N	N	3mm	1mm	20cm	BottomUp	
4	Axial	T1	N	N	3mm	1mm	20cm	BottomUp	
5	Axial	SWI	N	N	2mm	1mm	20cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
6	Axial	DWI	N	N	3mm	1mm	20cm	BottomUp	
POST-CONTRAST (CHECK WITH NEURORADIOLOGIST FIRST)									
7	Axial	T1	Y	N	3mm	1mm	24cm	BottomUp	
8	Axial	FSPGR	Y	N	1mm	0mm	25.6cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.
OPTIONAL SEQUENCES IF NEW/DE NOVO TUMOR									
9	DTI								
10	Perfusion								
11	Spectroscopy								



Position: Axial images should be parallel to the planum sphenoidale and the hard palate and cover the entire brain (including the scalp at the vertex and through the foramen magnum inferiorly). Coronal and sagittal images can be aligned perpendicular to the axial slices and should include the entire brain.

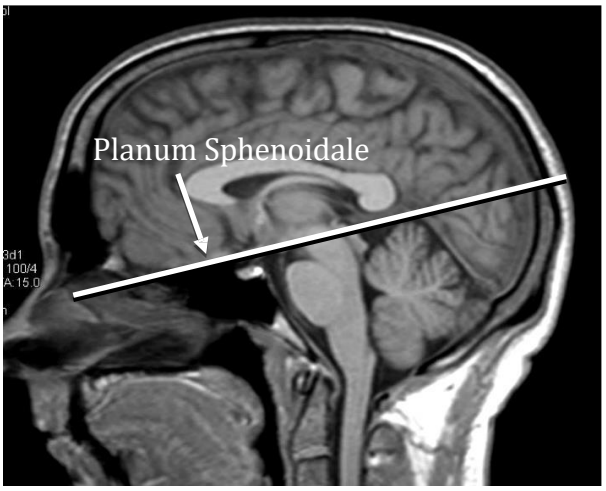
NOTE: Run DWI last so as not to prematurely wake a sedated child.

BRAIN – PEDIATRIC GREATER THAN 18 MONTHS

PACS Description: MRI Brain WO and W

Indications – Metastatic disease, infection, inflammation, new seizure, headache.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Axial	FSPGR	N	N	1mm	0mm	25.6cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.
2	Axial	T2	N	N	4mm	1mm	23cm	BottomUp	
3	Axial	FLAIR	N	N	4mm	1mm	23cm	BottomUp	
4	Axial	T1	N	N	4mm	1mm	23cm	BottomUp	
5	Axial	SWI	N	N	2mm	1mm	23cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
6	Axial	DWI	N	N	4mm	1mm	23cm	BottomUp	
POST-CONTRAST (CHECK WITH NEURORADIOLOGIST FIRST)									
7	Axial	T1	Y	N	4mm	1mm	23cm	BottomUp	
8	Axial	FSPGR	Y	N	1mm	0mm	25.6cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.
OPTIONAL SEQUENCES IF NEW/DE NOVO TUMOR									
9	DTI								
10	Perfusion								
11	Spectroscopy								



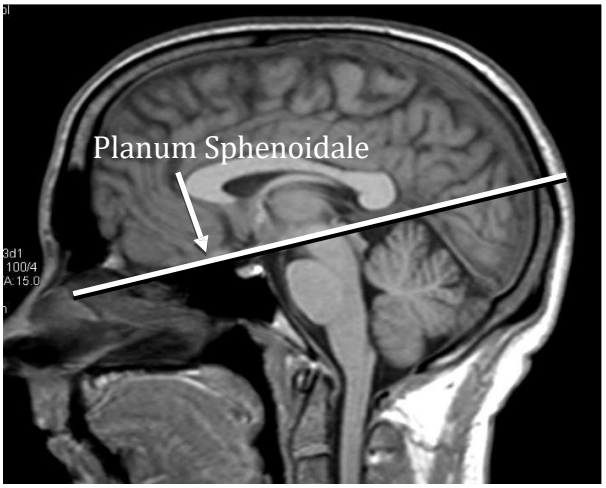
Position: Axial images should be parallel to the planum sphenoidale and the hard palate and cover the entire brain (including the scalp at the vertex and through the foramen magnum inferiorly). Coronal and sagittal images can be aligned perpendicular to the axial slices and should include the entire brain.

BRAIN – MULTIPLE SCLEROSIS

PACS Description: MRI Brain WO and W

Indications – Suspected or follow-up multiple sclerosis/demyelinating disease.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	T1	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
5	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
POST-CONTRAST									
6	Axial	FLAIR	Y	N	4mm	1mm	24cm	BottomUp	
7	Sag	FLAIR	Y	N	3mm	0mm	24cm	L to R	**Prefer 3D FLAIR where available**. Otherwise, use this 2D Sag FLAIR protocol.
8	Axial	T1	Y	N	4mm	1mm	24cm	BottomUp	
9	Axial	FSPGR	Y	N	2mm	0mm	25.6cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.



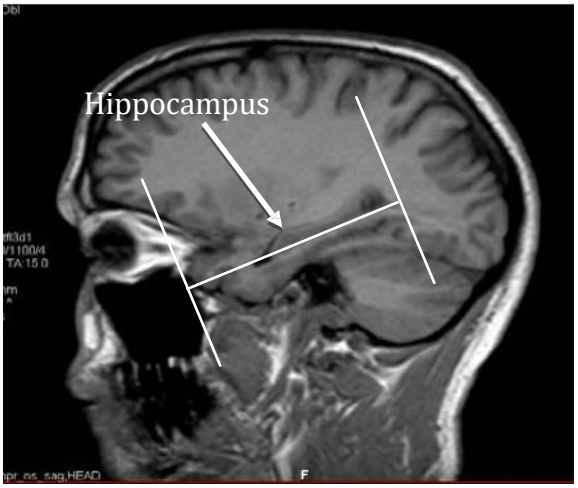
Position Axial images should be parallel to the planum sphenoidale and the hard palate and cover the entire brain (including the scalp at the vertex and through the foramen magnum inferiorly). Coronal and sagittal images can be aligned perpendicular to the axial slices and should include the entire brain. The Sagittal FLAIR should use the same positioning as the Sag T1.

BRAIN – EPILEPSY, CHRONIC SEIZURES

PACS Description: MRI Brain WO

Indication - Use for all adult and pediatric **chronic** seizure disorders

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
1	Axial	FSPGR	N	N	2mm	0mm	25.6cm	L to R	Sag recon: Align to planum sphenoidale Cor recon: Perpendicular to axial.
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	FLAIR	N	N	2mm	0mm	24cm	BottomUp	
5	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
6	Cor	T2	N	N	4mm	1mm	24cm	A to P	Through hippocampus
7	Cor	FLAIR	N	N	4mm	1mm	24cm	A to P	Whole brain



Position: Same as Routine Brain without for sequences 1-4. The Coronal T2 should be set up perpendicular to the hippocampus and should cover the entire temporal lobe. The Coronal FLAIR should use the same orientation as the Coronal T2, but should cover the whole brain. The Coronal recons from the FSPGR should match the Coronal T2 and FLAIR studies in orientation.

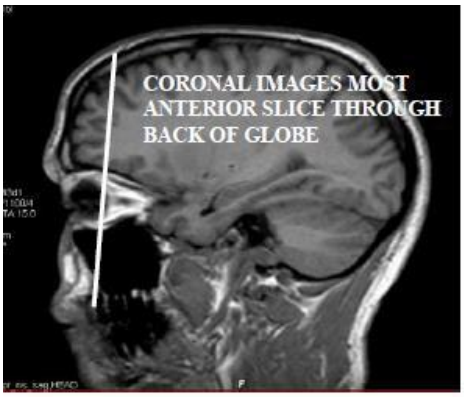
BRAIN – ORBITS

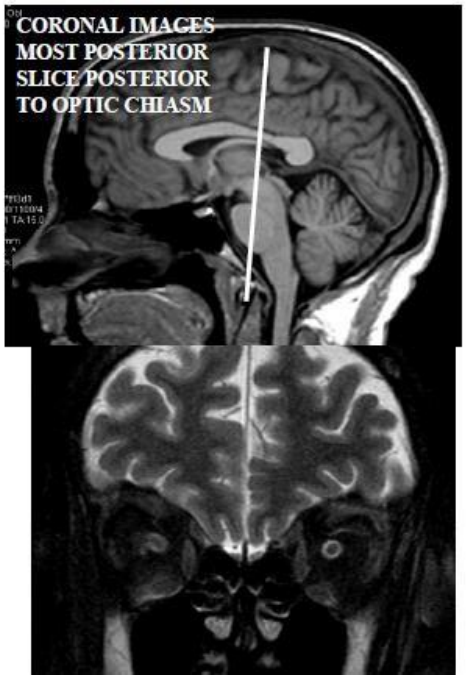
PACS Description: MRI Orbits WO and W

Indication – Optic neuritis, orbital mass, thyroid ophthalmopathy.

NOTE: In most cases, the patient will also need a separate order for an MRI of the Brain WO and W contrast.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Cor	STIR	N	N	3mm	0.5mm	18cm	A to P	Orbits. See below.
2	Axial	T1	N	N	3mm	0.5mm	18cm	BottomUp	Orbits. See below.
3	Cor	T1	N	N	3mm	0.5mm	18cm	A to P	Orbits. See below.
4	Axial	T2	N	N	2mm	1mm	18cm	BottomUp	
POST-CONTRAST									
5	Axial	T1 FS	Y	Y	3mm	0.5mm	18cm	BottomUp	Orbits. See below.
6	Cor	T1 FS	Y	Y	3mm	0.5mm	18cm	A to P	Orbits. See below.





Position: Same as Routine Brain without for sequences 1-4. The Coronal T2 should be set up perpendicular to the hippocampus and should cover the entire temporal lobe. The Coronal FLAIR should use the same orientation as the Coronal T2 but should cover the whole brain. The Coronal recons from the FSPGR should match the Coronal T2 and FLAIR studies in orientation.

BRAIN – MRA Circle of Willis WITHOUT and/or WITH CONTRAST

PACS Description: MRA Head WO

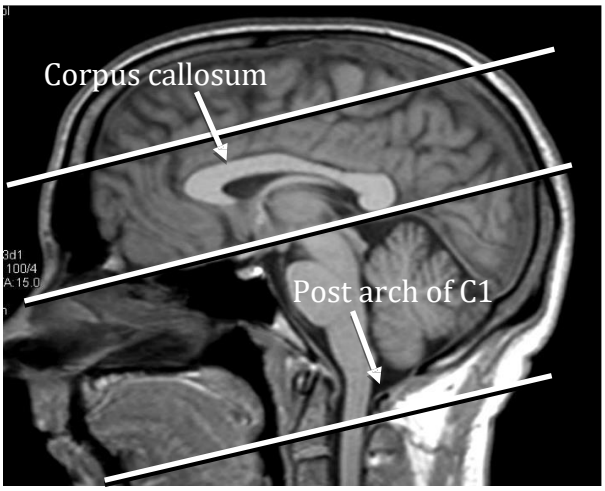
Indication – Aneurysm, stroke, vascular malformation, vasculitis.

-or-

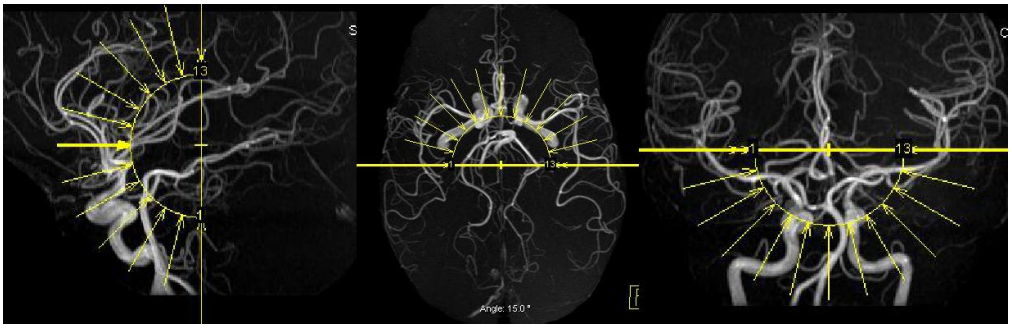
PACS Description: MRA Head WO and W

Indication – Aneurysm, vascular malformation. Only performed by special request and should include without and with sequences below.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Localizer								
2	COW TOF		N	N	1mm	0mm	20cm		Circle of Willis
POST-CONTRAST									
3	MRA CE		Y	N	1mm	0mm	20cm		Circle of Willis
RECONSTRUCTIONS									
4	MIP Recons								
5	MIP Recons								
6	MIP Recons								



Position: Include circulation from C1 to 1cm above the corpus callosum.



BRAIN – MRA Whole Brain WITHOUT and/or WITH CONTRAST

PACS Description: MRA Head WO

Indication – Vascular malformation, vasculitis.

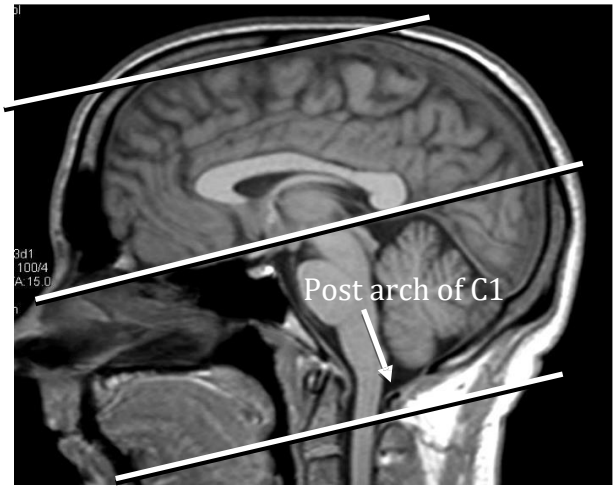
-or-

PACS Description: MRA Head WO and W

Indication – Vascular malformation, vasculitis. Only performed by special request.

NOTE: *MRA of the Head without and with contrast (aneurysm protocol)* requires both the standard MRA TOF without and the MRA post-contrast.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Localizer								
2	COW TOF		N	N	1mm	0mm	20cm		Whole brain
OPTIONAL POST-CONTRAST									
3	MRA CE		Y	N	1mm	0mm	20cm		When specifically requested (aneurysm protocol)
4	TWIST/TRICKS		Y	N					When specifically requested (AVM protocol)
OPTIONAL									
5	MIP Recons of TOF and MRA CE								



Position: Include circulation form C1 to the superior sagittal sinus.

NECK – MRA NECK WITHOUT and/or WITH CONTRAST

NOTE: Please do not use this protocol for a dissection. Use the separate dissection protocol.

PACS Description: MRA Neck WO and W

Indication – Stroke, carotid stenosis, vascular malformation, subclavian steal (should use TRICKS/TWIST w any vascular malformation or subclavian steal).

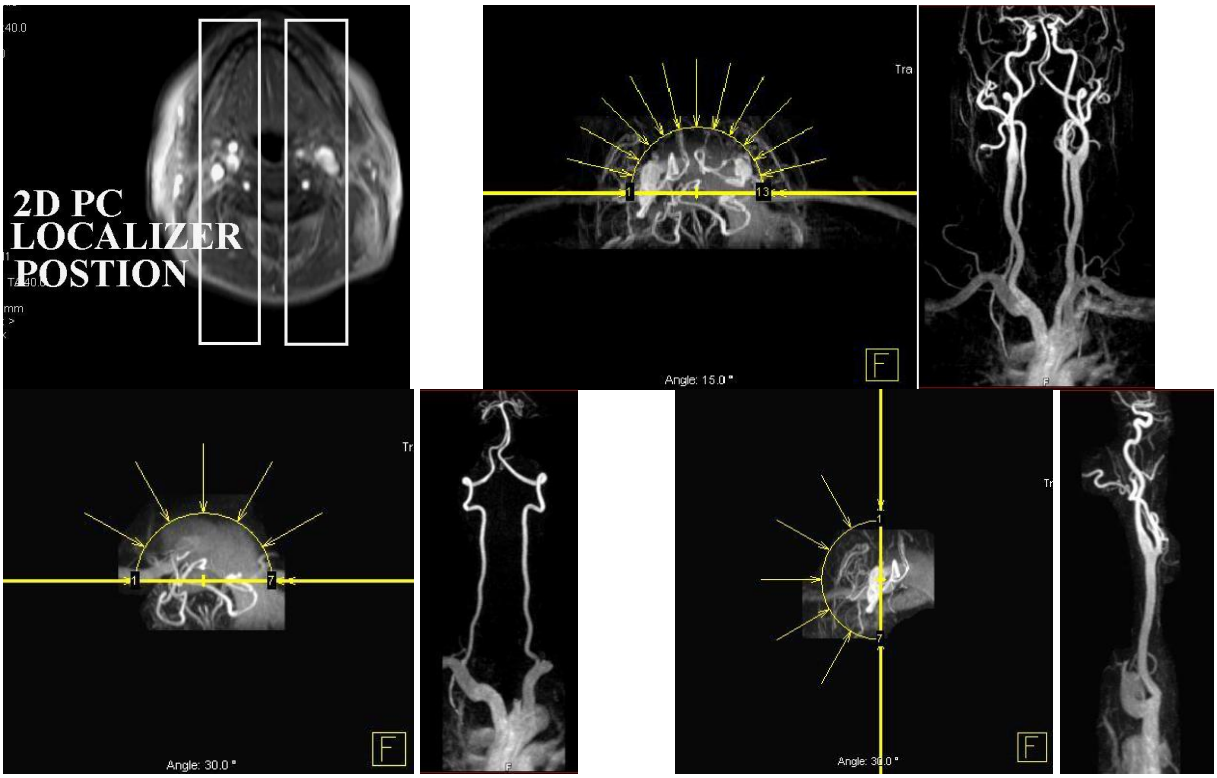
-or-

PACS Description: MRA Neck WO

Indication – (Only if they cannot have contrast). Stroke, carotid stenosis, vascular malformation, subclavian steal.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Localizer								
2	MRA 2D TOF		N	N	3mm	0mm	20cm		
3	MRA 3D CE Pre		N	N	1.2mm	0mm	35cm		Only if going to admin contrast.
POST-CONTRAST									
4	MRA 3D CE Post		Y	N	1.2mm	0mm	35cm		
OPTIONAL									
5	TRICKS/TWIST								For vascular malformation or subclavian steal
RECONSTRUCTIONS									
6	MIP Recons of 2D TOF and CE Post								
7	Subtractions for MRA 3D CE								

Position: Cover from aortic arch through circle of Willis.



NECK - RULE OUT DISSECTION

PACS Description:

1. **MRI Neck WO**
2. **MRA Neck WO and W**

Indications - TIA/Stroke patient with associated neck or retro-orbital pain, child or young adult with stroke, trauma patients developing infarcts.
Note: Need orders for both the MRI Neck and MRA Neck.

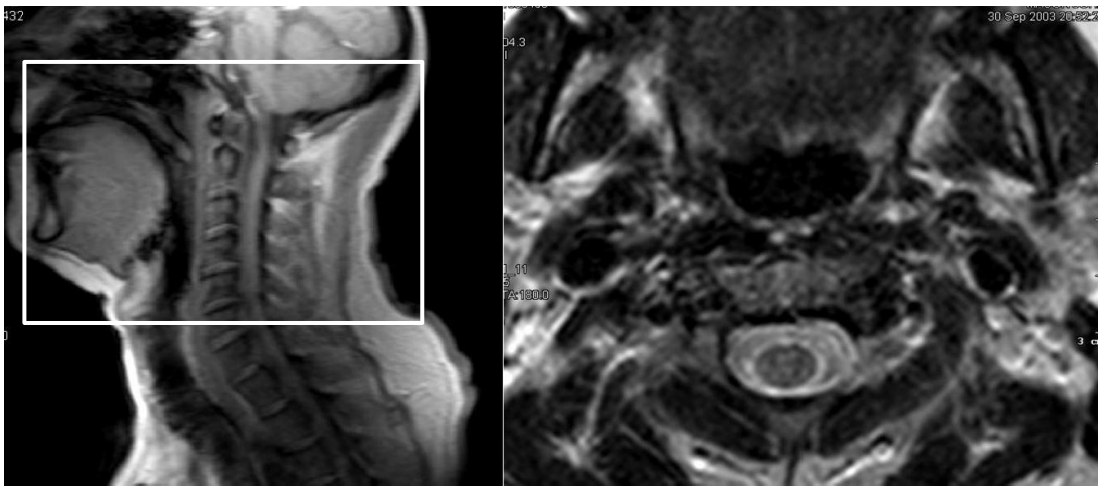
1. MRI NECK (VESSEL WALL IMAGING)

NOTE: THESE SEQUENCES MUST BE ACQUIRED PRE-CONTRAST!!!

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
1	Axial	T1 FS	N	Y	4mm	1mm	20cm	BottomUp	
2	Axial	T2	N	N	3mm	1mm	20cm	BottomUp	

2. MRA NECK

Per MRA Neck WO and W protocol



A. **MR Neck Position**: Cover from vertebrobasilar junction through C5.
B. **MRA Neck**: Use MRA Neck positioning from above.

BRAIN and NECK - Stroke

PACS Description:

1. **MRI Brain WO and W**
2. **MRA Head WO**
3. **MRA Neck WO and W**

Indications - TIA/Stroke patient with associated neck or retro-orbital pain, child or young adult with stroke, trauma patients developing infarcts.

1. MRI BRAIN

Routine Brain without and with contrast protocol

2. MRA HEAD

MRA Circle of Willis protocol (no contrast)

3. MRA NECK

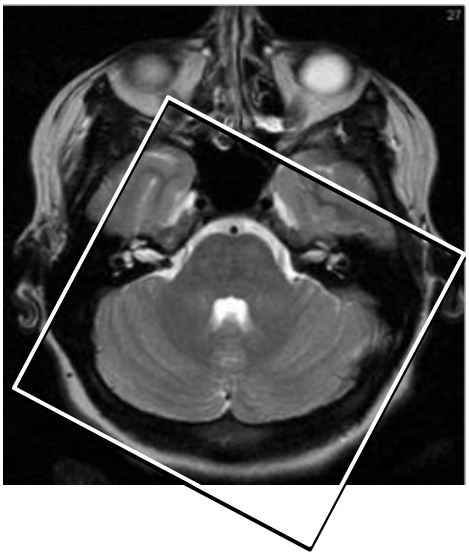
MRA Neck without and with contrast protocol

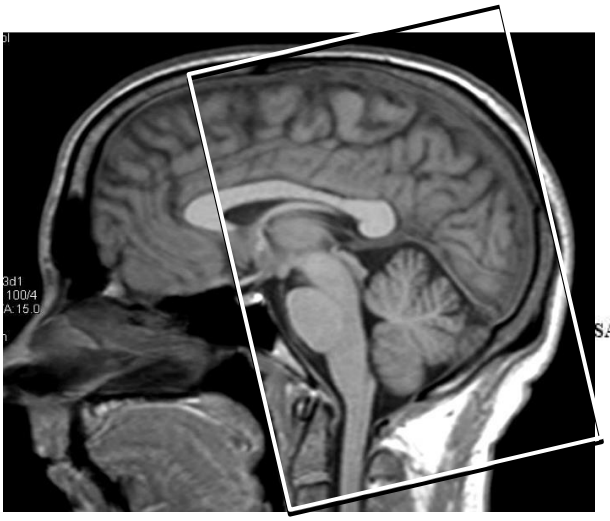
BRAIN – MRV HEAD WITHOUT

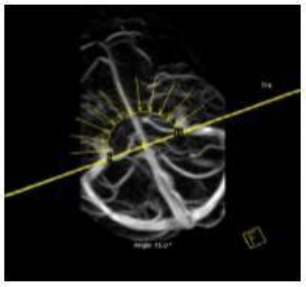
PACS Description: MRV Head WO

Indication – Atypical/venous stroke, venous thrombosis, pseudotumor, papilledema with unexplained cause, unexplained increased ICP; lethargy, headache, seizure, or new focal deficit in patient with hypercoagulable state, leukemia, or dehydration; complicated meningitis.

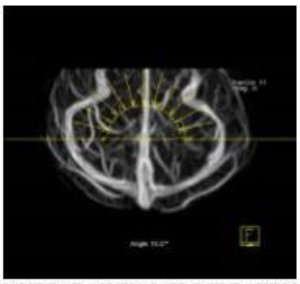
#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Localizer								
2	Sag 3D TOF MRV midline		N	N	2mm	0mm	24cm		
3	Sag 3D TOF MRV offset		N	N	2mm	0mm	24cm		
4	Sag 3D Phase contrast				5mm	2mm	28cm		*(Optional, at request of radiologist)* Venc = 10cm/s Reference: https://mrimaster.com/mrv-brain/
POST-CONTRAST									
5	Sag 3D Post Contrast				1mm	0mm	28cm		
RECONSTRUCTIONS									
6	MIP Recons								







SAGITTAL SINUS MIP DIRECTION



TRANSVERSE SINUS MIP DIRECTION

Position: Acquire two planes to distinguish actual findings from artifact.

BRAIN – CSF FLOW STUDY, CHIARI MALFORMATION

PACS Description:

1. **MRI Brain WO**
2. **MRI Brain Cine Flow**

Indication - Chiari malformation, evaluation for restriction of CSF flow through the foramen magnum.

1. MR Brain

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	

Position: Use positioning from Routine Brain protocol.

2. MR Brain Cine Flow

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
1	Sag FLASH CINE		N	N	10mm	0mm	18cm		Venc 20 cm/s
2	Sag FLASH CINE		N	N	10mm	0mm	18cm		Venc 10 cm/s
OPTIONAL									
3	Ax FLASH CINE		N	N	10mm	0mm	18cm		Venc 20 cm/s
4	Ax FLASH CINE		N	N	10mm	0mm	18cm		Venc 10 cm/s

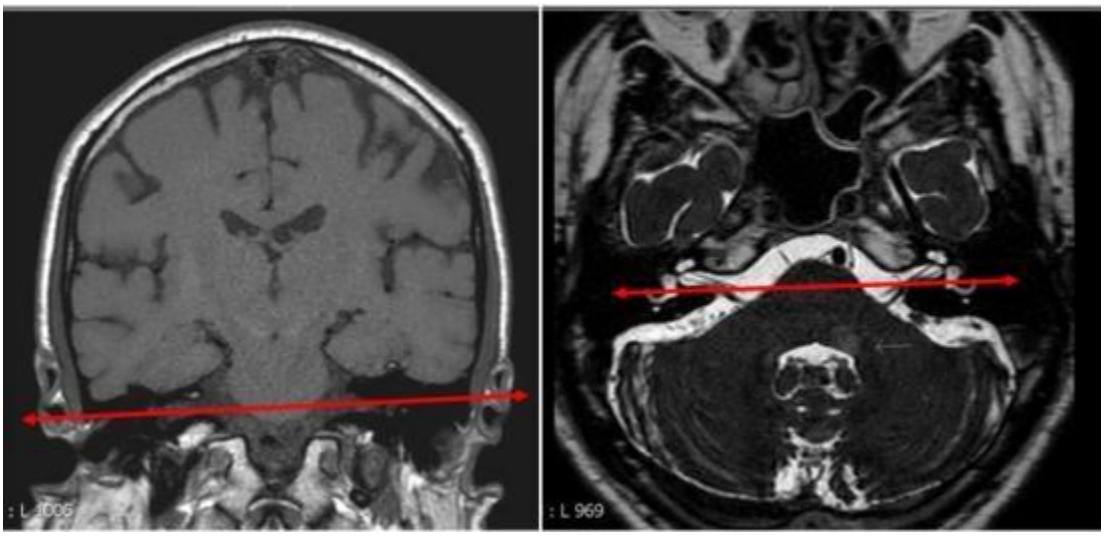
Position: The optional axial sequence should be positioned parallel to C1.

ENT – IAC

PACS Description: MRI IACs WO and W

Indication – Vertigo, sensorineural hearing loss (SNHL), Bell's palsy, **non**-pulsatile tinnitus, cerebellopontine angle mass

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST BRAIN									
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
PRE-CONTRAST IACs									
5	Axial	T1	N	N	2mm	0mm	18cm	BottomUp	
6	Axial	3D T2	N	N	1mm	0mm	18cm	BottomUp	Or CISS/SPACE/FIESTA. If none are available, then 2mm thick with no gap and 18cm FOV.
POST-CONTRAST BRAIN									
7	Axial	FLAIR	Y	N	4mm	1mm	24cm	BottomUp	
8	Axial	BRAVO	Y	N	2mm	0mm	24cm	BottomUp	
POST-CON IACS									
9	Axial	T1	Y	Y	2mm	0mm	18cm	BottomUp	
10	Cor	T1	Y	Y	2mm	0mm	18cm	L to R	
OPTIONAL (if cholesteatoma)									
11	Axial	DWI non-echoplanar	N	N	2mm	0mm	18cm	BottomUp	Same coverage as IAC



Position: Align the axial and coronal images so that the IACs are symmetric on each slice.

ENT – PULSATILE TINNITUS

PACS Description:

1. **MRI IACs WO and W**
   MRI IACs wo and w

2. **MRA Head WO**
   MRA Head WO

3. **MRV Head WO**
   MRV Head WO

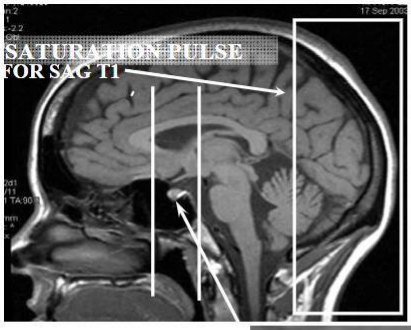
Indication – Pulse synchronous tinnitus.

ENT – SELLA, INITIAL EVALUATION

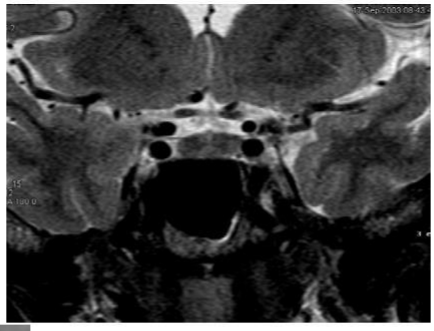
PACS Description: MRI Sella WO and W

Indication – Suspected pituitary or sellar mass (microadenoma). Only for initial evaluation.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST BRAIN									
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
PRE-CONTRAST SELLA									
5	Cor	T1	N	Y	2mm	0mm	13cm	A to P	
6	Cor	T2	N	N	2mm	0mm	13cm	A to P	
POST-CONTRAST BRAIN									
7	Axial	FLAIR	Y	N	4mm	1mm	24cm	BottomUp	
8	Axial	T1	Y	N	4mm	1mm	24cm	BottomUp	
POST-CON SELLA									
9	Cor	T1	Y	N	3mm	0.2mm	13cm	A to P	Dynamic; 4 measurements
10	Cor	T1	Y	Y	2mm	0mm	13cm	A to P	
11	Sag	T1	Y	Y	2mm	0mm	18cm	L to R	



COR SELLA COVERAGE



CORONAL T2 IMAGE

CORONAL T1 IMAGE

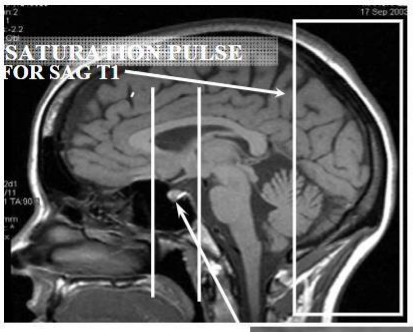
Position: Coronal sella sequences should be aligned perpendicular to the sella floor. Sagittal sella sequences should be perpendicular/orthogonal to the coronal sequences.

ENT – SELLA, FOLLOW-UP EVALUATION

PACS Description: MRI Sella WO and W

Indication – Known pituitary or sellar mass. If microadenoma, include DYNAMIC. If macroadenoma, do not include DYNAMIC.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST BRAIN									
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	N	4mm	1mm	24cm	BottomUp	
4	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred. Otherwise, GRE
PRE-CONTRAST SELLA									
5	Cor	T1	N	Y	2mm	0mm	13cm	A to P	
6	Cor	T2	N	N	2mm	0mm	13cm	A to P	
POST-CONTRAST BRAIN									
7	Axial	FLAIR	Y	N	4mm	1mm	24cm	BottomUp	
8	Axial	T1	Y	N	4mm	1mm	24cm	BottomUp	
POST-CON SELLA									
9	Cor	T1	Y	N	3mm	0.2mm	13cm	A to P	Not required if the patient has a known pituitary macroadenoma. Dynamic; 4 measurements
10	Cor	T1	Y	Y	2mm	0mm	13cm	A to P	
11	Sag	T1	Y	Y	2mm	0mm	18cm	L to R	



COR SELLA COVERAGE

CORONAL T2 IMAGE

CORONAL T1 IMAGE

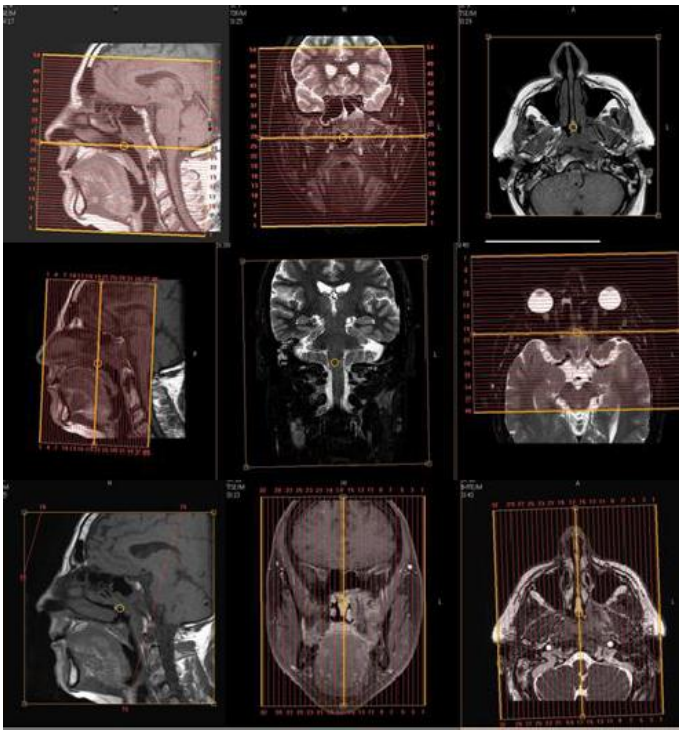
Position: Coronal sella sequences should be aligned perpendicular to the sella floor. Sagittal sella sequences should be perpendicular/orthogonal to the coronal sequences.

ENT – SKULL BASE AND TRIGEMINAL NEURALGIA

PACS Description: MRI Skull Base WO and W

Indication – Suspected skull base, clivus tumor, or perineural spread. Include TOF if indication is CN3 palsy.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST BRAIN									
1	Sag	T1	N	N	4mm	1mm	24cm	L to R	
2	Axial	DWI	N	N	4mm	1mm	24cm	BottomUp	
3	Axial	T2	N	Y	4mm	1mm	24cm	BottomUp	
4	Axial	SWI	N	N	2mm	1mm	24cm	BottomUp	SWI/SWAN preferred, otherwise GRE
PRE-CONTRAST SKULL BASE									
5	Axial	T1	N	Y	3mm	0.5mm	18cm	BottomUp	
6	Cor	T1	N	Y	3mm	0.5mm	18cn	A to P	
7	Cor	T2	N	Y	2mm	0.5mm	18cm	A to P	
8	Axial	3D T2	N	N	1mm	0mm	18cm	BottomUp	CISS/SPACE/FIESTA. If none of these available, consider sending patient to a different facility.
POST-CONTRAST BRAIN									
8	Axial	FLAIR	Y	N	4mm	1mm	24cm	BottomUp	
10	Axial	T1	Y	N	4mm	1mm	24cm	BottomUp	
POST-CON SKULL BASE									
11	Axial	T1	Y	Y	3mm	0.5mm	18cm	BottomUp	
12	Cor	T1	Y	Y	3mm	0.5mm	18cm	A to P	
OPTIONAL (if indication is CN3 palsy)									
13	MRA COW TOF								Will need a separate MRA Head order.



Position: Axial skull base sequences should extend from hyoid through the frontal sinuses. Coronal sequences should extend from the nose to back of the brain stem.

ENT – SCREENING NECK, LARYNX/HYPOPHARYNX, OROPHARYNGEAL

PACS Description: MRI Neck WO and W

Indication – Nodal disease evaluation.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Sag	T1	N	N	4mm	1 mm	25cm	L to R	
2	Cor	T1	N	N	4mm	1 mm	25cm	A to P	
3	Axial	T2	N	Y	4mm	1 mm	20cm	BottomUp	
4	Axial	T1	N	N	4mm	1 mm	20cm	BottomUp	
POST-CONTRAST									
5	Axial	T1	Y	N	4mm	1 mm	20cm	BottomUp	
6	Axial	T1	Y	Y	4mm	1 mm	20cm	BottomUp	
7	Cor	T1	Y	Y	4mm	1 mm	25cm	A to P	

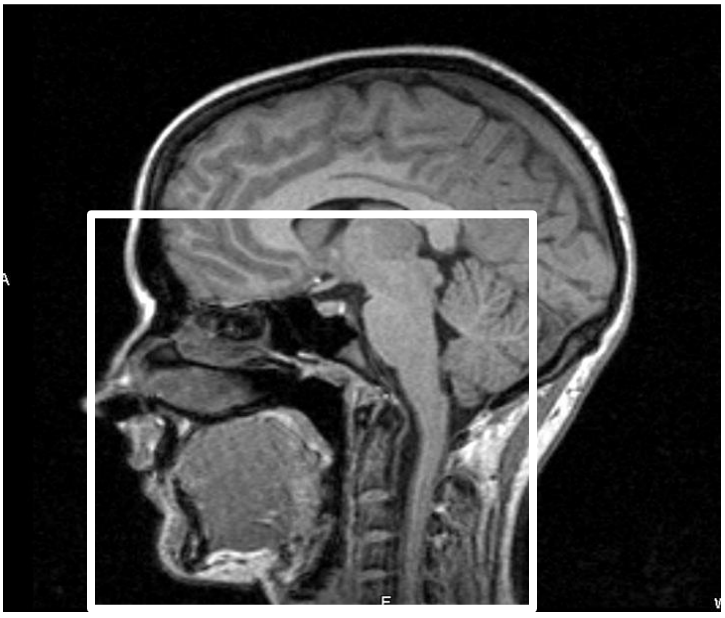
Position: Axial coverage is from skull base to thoracic inlet. Coronal coverage is entire neck posterior to anterior.

ENT – MID-FACE, NASOPHARYNX, PARAPHARYNGEAL

PACS Description: MRI Neck or Face WO and W

Indication – Lesions of the maxilla, palate, mandible, and anterior/posterior skull base.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
PRE-CONTRAST									
1	Sag	T2	N	Y	3mm	0.5mm	25cm	L to R	
2	Cor	T1	N	N	3mm	0.5mm	25cm	A to P	
3	Cor	T2	N	Y	3mm	0.5mm	25cm	A to P	
4	Axial	T2	N	Y	4mm	1mm	20cm	BottomUp	
5	Axial	T1	N	N	3mm	0.5mm	20cm	BottomUp	
POST-CONTRAST									
6	Sag	T1	Y	Y	3mm	0.5mm	25cm	L to R	
7	Axial	T1	Y	Y	3mm	0.5mm	20cm	BottomUp	
8	Cor	T1	Y	Y	3mm	0.5mm	25cm	A to P	



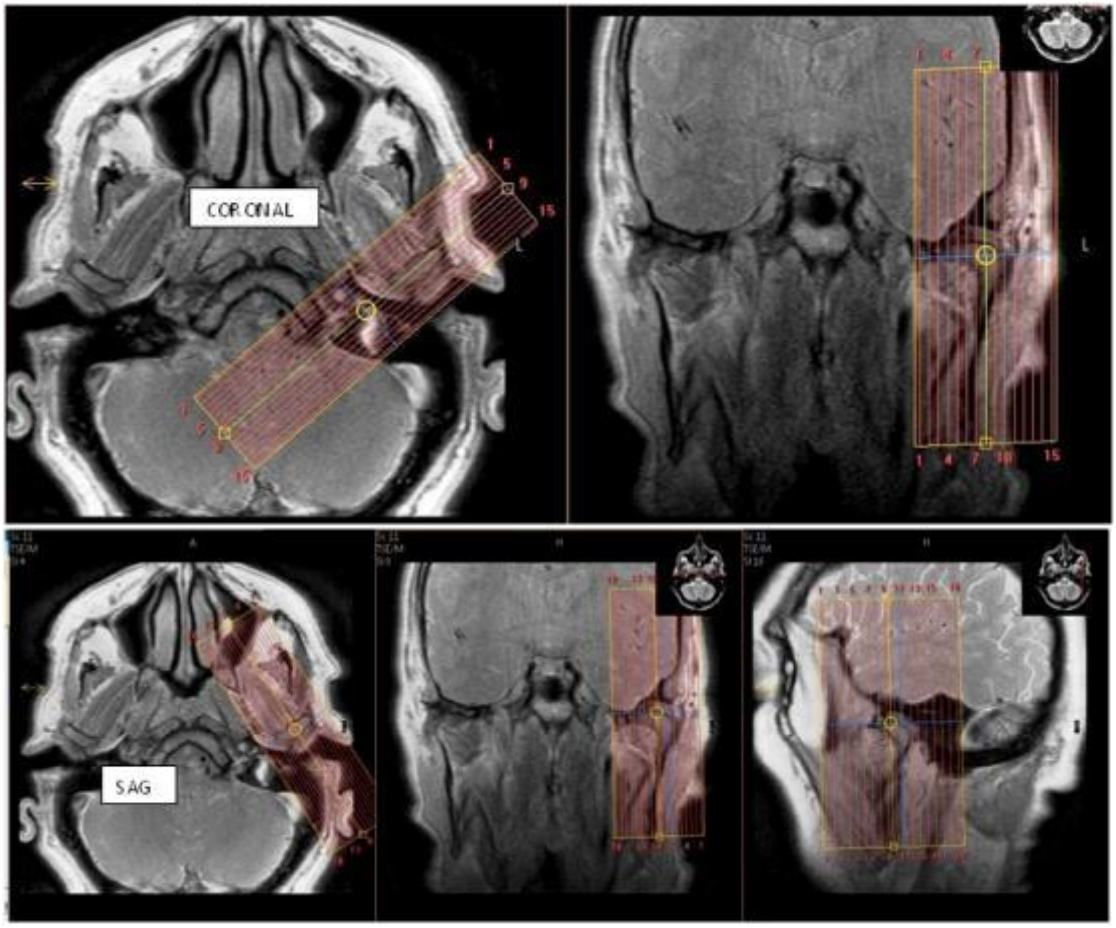
Position: Axial coverage is from frontal sinuses through mandible. Coronal coverage is from tip of nose through back of neck.

ENT – TMJ

PACS Description: MRI Temporomandibular Joint WO

Indication – TMJ dysfunction.

#	Orient	Seq	Con-trast	Fat Sat	Slice Thick	Gap	FOV	View Order	Comment
1	Axial	T1	N	N	4mm	1mm	25cm	Bottom Up	
2	Sag	T2	N	N	2mm	0mm	12cm	L to R	Closed
3	Sag	PD	N	N	3mm	0.5mm	12cm	L to R	Closed
4	Cor	T1 Left	N	N	2mm	0mm	12cm	A to P	Closed
5	Cor	T1 Right	N	N	2mm	0mm	12cm	A to P	Closed
6	Sag	PD	N	Y	3mm	0.5mm	12cm	L to R	Open
7	Sag	Cine Left	N	N	4mm	0mm	15cm	L to R	
8	Sag	Cine Right	N	N	4mm	0mm	15cm	L to R	



Position: Coverage through the TMJs.