

Sites **WITHOUT 3D** sequence capability  
(eg, BRAVO, SWI/SWAN, CUBE **NOT** available)

Exam	Axial	Sagittal	Coronal
<b>BRAIN WITHOUT IV CONTRAST</b>			
<b>Routine</b>	T2 FSE FS, FLAIR, DWI/ADC, <b>GRE T2*</b> (TE = at least 30 on most scanners)	T1	
<b>Seizure: Routine plus</b>	Coronal oblique perpendicular to hippocampi (smaller FOV): FLAIR (2 mm) and T2 FSE (3 mm)		
<b>Dementia: Routine plus</b>	Coronal oblique FLAIR (3 mm) through temporal lobes		
<b>MR Quick Brain<sup>1</sup></b>	Triplane localizer, <b>DWI/ADC</b> , T2 SSFSE	Triplane localizer, T2 SSFSE	Triplane localizer, T2 SSFSE
<b>Acute stroke (limited)</b>	Triplane localizer, T2* GRE, FLAIR, DWI/ADC, Perfusion (DSC T2*)	Triplane localizer	Triplane localizer
<b>Deluxe MR stroke (limited)<sup>2</sup>: Acute stroke (limited) plus →</b>	Axial T2 FSE FS, Sag T1, MRA COW 3DTOF, MRA Neck: 2DTOF through neck vasculature, 3DTOF post through neck vasculature		
<b>BRAIN WITHOUT AND WITH IV CONTRAST</b>			
<b>Demyelinating disease (eg, MS): Routine plus →</b>	T1 pre and post	- FLAIR (Post-contrast preferred; if noncontrast study, add FLAIR pre-Gd) - T1 post	
<b>Tumor: Routine plus →</b>	Perfusion T1 pre and post	T1 post	T1 post
<b>7<sup>th</sup>/8<sup>th</sup> CN (hearing loss, tinnitus, etc.): Routine plus → For pulsatile tinnitus, add MRA 3dTOF COW</b>	- T2 FIESTA (1 mm no gap) (through IAC) - T1pre & post (2 mm no gap) (through IAC)		T1 post FS (2 mm no gap) (orbital apex to 4 <sup>th</sup> ventricle)

<sup>1</sup> This is to avoid sedation in chronic patients such as VP shunt follow-ups, regardless of age, or for screening examination such as with increased head circumference.

<sup>2</sup> Must be rad approved. Done very rarely as CT/CTA/CT perfusion is preferred for acute stroke triage.

	- T1 pre & post (entire brain)		
<b>CN V/Trigeminal neuralgia: Routine plus →</b>	- Thin T1 pre & T2 fat sat (3 mm thick, no skip, FOV chin-frontal sinus) - Fiesta (FOV CN III to VII/VIII) - Thin T1 fat sat post		-Thin T1 fat sat post (3 mm thick, no skip, FOV 4th vent-frontal sinus)
<b>Pituitary gland PRE-OP: Routine plus →</b>	- T1 pre & post (entire brain)	- T1 fat sat (3 mm no gap) (pituitary gland) - T1 fat sat post (3 mm no gap) (pituitary gland)	- T1 (3 mm no gap) (pituitary gland) - T2 (3 mm no gap) (pituitary gland) - T1 FSE dynamic @ 30 sec intervals x 5 (3 mm no gap) (pituitary gland) - T1 post (3 mm) (pituitary gland)
<b>Pituitary gland POST-OP: Routine plus →</b>		- T1 fat sat (3 mm) (pituitary gland) - T1 fat sat post (3 mm) (pituitary gland)	- T1 (3 mm) (pituitary gland) - T2 (3 mm) (pituitary gland) - T1 fat sat post (3 mm) (pituitary gland)
<b>MRV (dural venous thrombus): MUST HAVE CONTRAST!</b>	- T2* GRE - T1 pre - (reformatted T1 3dTOF SPGR post)	- T1 3dTOF SPGR post (reformat into ax, cor)	- 2D TOF SPGR - (reformatted T1 3dTOF SPGR post)
<b>Orbits:</b>	- T1 (entire brain) - T2 FS (entire brain)		- T1 (chiasm through orbits) - STIR (chiasm through orbits) - T1 FS post (chiasm through orbits)

<b>BRAIN PEDIATRIC NEURO PROTOCOLS</b>			
<b>[No infant protocols for non-BRAVO sites.]</b>			
<b>Peds (24 m – 5 y)</b>	- T1 (4 mm) - FLAIR (4 mm) - T2 FSE (4 mm) - DWI/ADC - T2* GRE	T1 (4 mm)	SPGR (1.5 mm)
<b>Mass: above plus →</b>	T1 post	T1 post	T1 post
<b>Seizures: above plus →</b>	Coronal oblique perpendicular to hippocampi (smaller FOV): FLAIR (2 mm) and T2 FSE (3 mm)		

Sites **WITH 3D** sequence capability  
(eg, BRAVO, SWI/SWAN, CUBE **ARE** available)

<b>Exam</b>	<b>Axial</b>	<b>Sagittal</b>	<b>Coronal</b>
<b>BRAIN WITHOUT IV CONTRAST</b>			
<b>Routine</b>	- T2 FSE FS, DWI/ADC, - SWI/SWAN - CUBE FLAIR fat sat @ 1mm reformatted into <b>Axial ONLY</b> 3mm	T1 BRAVO SPGR @ 1 mm with reformatted <b>sagittal ONLY</b>	NO additional recons unless rad requested
<b>Seizure: Routine plus</b>	Coronal oblique perpendicular to hippocampi (smaller FOV): FLAIR (2 mm) and T2 FSE (3 mm).		
<b>Dementia: Routine plus</b>	Coronal oblique FLAIR (3 mm) through temporal lobes.		
<b>Traumatic brain injury: Routine plus</b>	Based on rad preference, add 25-direction DTI w/FA map, 3 directional color encoded maps; ROI quantitative values and tractograms as directed by radiologist		

<b>CSF Flow NPH vs aqueductal stenosis:</b> - <b>Must have prior Dx brain MRI</b>	- (reformatted 3D T2 CUBE) - Axial PC CSF Flow <b>perpendicular to aqueduct:</b> Venc 10, 15, 20 - If quantitative available, do Venc of 15 and provide flow parameters	- 3D T2 CUBE - Sag PC CSF through midline (start with Venc 10, add 15 and 20 if aliasing or no flow)	
<b>CSF flow Chiari Malformation</b>		- 3D T2 CUBE whole brain - 3D FIESTA posterior fossa - Sag PC CSF through midline (start with Venc 10, add 15 and 20 if aliasing or no flow)	
<b>Spectroscopy:</b> - <b>Must have prior Dx brain MRI</b> - <b>Contrast if needed</b> - <b>Monitored by neurorad</b>	Minimum: - Anatomic sequence based on rad preference) - Single voxel TE 144 IN lesion and control (add 35 or 288 if directed by rad) - Multivoxel CSI IN lesion		
<b>Functional:</b> - <b>Individualized based on lesion location and rad preference</b>	Minimum: - 3D anatomic sequences - At least 2 paradigms - 25-direction DTI - Perfusion based on rad preference		
<b>BRAIN WITHOUT AND WITH IV CONTRAST</b>			
<b>MR “Triple” (brain, MRA arch/carotids and MRA brain)</b>	Routine brain without (see above) add 3D T1 post contrast (axial recons) MRA brain/COW TOF without only MRA arch/carotids pre and post	Routine brain without (see above)	
<b>Demyelinating disease (eg, MS): Routine plus →</b>	-T1 BRAVO SPGR pre and post 1mm - CUBE FLAIR FS reformatted 3mm	Do CUBE FLAIR fat sat postcontrast reformatted into sag, ax	(reformatted T1 BRAVO SPGR)
<b>Tumor: Routine plus →</b>	-T1 BRAVO SPGR pre and post 1mm - CUBE FLAIR FS reformatted 3mm	Do CUBE FLAIR fat sat postcontrast reformatted into sag, ax	(reformatted T1 BRAVO SPGR)
<b>PERFUSION: on ALL tumor cases – Routine without and with, then add</b>	Noncontrast ASL perfusion and post-contrast DSC T2* perfusion		

<b>7<sup>th</sup>/8<sup>th</sup> CN (hearing loss, vertigo, tinnitus, etc.): Routine plus → For pulsatile tinnitus, add MRA 3dTOF COW</b>	- T2 FIESTA (1 mm no gap) (through IAC) - axial only on PACS; provide add'l recons ONLY if requested - T1 pre & post (2 mm no gap) (through IAC) - Whole brain: T1 pre & post-contrast reformatted T1 BRAVO; No other recons unless requested by rad		T1 post FS (2 mm no gap) (orbital apex to 4 <sup>th</sup> ventricle)
<b>CN V/Trigeminal neuralgia: Routine plus →</b>	- Thin T1 pre & T2 fat sat (3 mm thick, no skip, FOV chin-frontal sinus) - Fiesta (FOV CN III to VII/VIII) - Thin T1 fat sat post		-Thin T1 fat sat post (3 mm thick, no skip, FOV 4th vent-frontal sinus)
<b>Pituitary gland PRE-OP: Routine plus →</b>	Whole brain: - T1 pre - Post-contrast reformatted T1 BRAVO; No other recons unless requested by rad	- T1 fat sat (3 mm no gap) (pituitary gland) - T1 fat sat post (3 mm no gap) (pituitary gland)	- T1 (3 mm no gap) (pituitary gland) - T2 (3 mm no gap) (pituitary gland) - T1 FSE dynamic @ 30 sec intervals x 5 (3 mm no gap) (pituitary gland) - T1 post (3 mm) (pituitary gland)
<b>Pituitary gland POST-OP: Routine plus →</b>		- T1 fat sat (3 mm) (pituitary gland) - T1 fat sat post (3 mm) (pituitary gland)	- T1 (3 mm) (pituitary gland) - T2 (3 mm) (pituitary gland) - T1 post (3 mm) (pituitary gland)
<b>MRV (dural venous thrombus): MUST HAVE CONTRAST!!</b>	- T1 pre - (reformatted T1 3dTOF SPGR post) - SWI/SWAN	- 3D Inhance phase-contrast - T1 3DTOF SPGR post (reformat into ax, cor)	2D TOF SPGR (reformatted T1 3dTOF SPGR post)
<b>Orbits</b>	T1 (entire brain) T2 FS (entire brain)		T1 (chiasm through orbits) STIR (chiasm through orbits) T1 FS post (chiasm through orbits)

<b>BRAIN PEDIATRIC NEURO PROTOCOLS</b>			
<b>Infant &lt;24 m. routine (congenital, migrational, myelination abnl)</b>	- T1 BRAVO - PD/T2 SE - SWI/SWAN (if not available, T2* GRE) 1-1 y/o: TR,TE 3000,60/120 1-2 y/o: TR,TE 2500, 30/80	T1 BRAVO reformatted	T1 BRAVO reformatted
<b>Infant Hypoxia/ischemia: routine plus →</b>	DW/ADC; 2dTOF MRA through neck and 3dTOF MRA through COW if positive		
<b>Infant Hydrocephalus: routine plus →</b>		T2 FRFSE (3 mm)	
<b>Infant Mass: routine plus →</b>	T1 post BRAVO	T1 post BRAVO	T1 post BRAVO
<b>Infant Seizures: routine plus →</b>	Coronal oblique perpendicular to hippocampi (smaller FOV): FLAIR (2 mm) and T2 FSE (3 mm)		
<b>Peds (24 m – 5 y) routine</b>	- T1 (4 mm) - FLAIR (4 mm) - T2 FSE (4 mm) - DWI/ADC	T1 (4 mm)	SPGR (1.5 mm)
<b>Peds Mass: routine plus →</b>	T1 post	T1 post	T1 post
<b>Peds Seizures: routine plus →</b>	Coronal oblique perpendicular to hippocampi (smaller FOV): FLAIR (2 mm) and T2 FSE (3 mm)		

<b>HEAD/NECK/PLEXUS NEURO PROTOCOLS</b>			
	Axial	Sagittal	Coronal
<b>Nasopharynx/Face (skull base, nasopharynx, face, sinus)</b>	- T1 pre (non fat sat) and post fat sat 4mm (top of frontal sinus to mandible) - T2 FSE FS - DWI / ADC (b = 800)	T1	- STIR - T1 FS post 3mm (all sinuses through 4th ventricle)
<b>Soft tissue neck</b>	- T1 pre (non fat sat) and post fat sat - T2 FSE fat sat - DWI / ADC (b = 800)		- STIR - T1 FS post
<b>Brachial plexus:</b> - Bilateral coverage on axial and coronal - Coverage C3 - T3 - Sagittal: symptomatic side mid humeral head - midline spinal line	T1 pre and post	- T1 pre and post - STIR	- T1 pre, post and post fat sat - STIR
<b>Lumbar plexus</b> Field of view from L1 to the lesser trochanter, all angles straight	NFS T1 (6 x 1 mm) FS T2 (6 x 1 mm) FS T1 post	NFS T1 pre (6 x 1 mm) FS T1 post (6 x 1)	NFS T1 (5 x 1 mm) FS T2 (5 x 1 mm) FS T1 (5 x 1 mm) pre and post