1.5T NEUROLOGICAL MRI PROTOCOLS
(Updated June 15, 2020)

General Guidelines

❖ NEVER hesitate to reach out to a radiologist for guidance!

❖ Sequence Names Siemens / GE: CISS/FIESTA, MPRAGE/FSPGR

❖ GE to perform post T1 FS Vibe Axial brain series as a conventional T1 FS Axial & Cor (when applicable)

❖ Spine with metal
  ➢ Perform T2 non-FS instead of STIR. T2s better visualize nerves.
  ➢ Post contrast T1 FS, repeat without FS.

BRAIN ROUTINE (HA, trauma, CVA, dizziness, altered mental status, etc.)
T1 Sag
Diffusion Axial
FLAIR Axial
CONTRAST
T2 FS Axial
GRE Cor
T2 FS Cor
T1 FS Vibe Axial post

NOTE:
  • Post processing from T1 FS Vibe Axial post
    o MPR: 4x0mm Cor & Sag
    o Thin MIP: 6x0mm Axial

BRAIN ROUTINE (loss of smell/anosmia)
T1 Sag
Diffusion Axial
T2 FLAIR Axial
CONTRAST FULL DOSE
T2 FS Axial
T2 FS Cor
GRE Cor
T2 CISS/Space Cor (2mm, 180 FOV, ~56 slices, posterior to sella through orbits)
T2 FS Cor (3x0.5mm, 180 FOV, ~30 slices
T1 FS Vibe Axial post

NOTE:
  • Post processing from T1 FS Vibe Axial post
    o MPR: 4x0mm Cor & Sag
    o Thin MIP: 6x0mm Axial
BRAIN ROUTINE WITHOUT CONTRAST
T1 Sag
Diffusion Axial
FLAIR Axial
T2 FS Axial
GRE Cor
T2 FS Cor

BRAIN ROUTINE WITH BRACES / SHUNT / SIGNIFICANT METAL IN MOUTH – NON FS, TSE/FSE
T1 Sag
Diffusion Axial
FLAIR Axial
CONTRAST
T2 Axial
GRE Cor
T2 Cor
T1 Vibe Axial post

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial

BRAIN TUMOR (mass, oncology, metastasis)
T1 3D Vibe Axial pre (1mm, perform 4x0mm Sag MPR)
Diffusion Axial
FLAIR Axial
CONTRAST
T2 FS Axial
T2 FS Cor
GRE Cor
T1 3D FS Vibe Axial post

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial
- ARA - Do not perform on GE

SETON NETWORK ONLY * BRAIN ROUTINE (HA, trauma, CVA, dizziness, altered mental status, etc.)
T1 Sag
Diffusion Axial
FLAIR Axial
CONTRAST
T2 FS Axial
GRE Axial
GRE Cor
T2 FS Cor
T1 FS Cor post
T1 FS Axial post
SETON NETWORK ONLY * BRAIN ROUTINE WITHOUT CONTRAST

- T1 Sag
- Diffusion Axial
- FLAIR Axial
- T2 FS Axial
- GRE Axial
- GRE Cor
- T2 FS Cor

**BRAIN CRANIAL NERVE 5** Cranial Nerve (trigeminal neuralgia, facial pain/tingling/numbness)

- T1 Sag
- Diffusion Axial
- FLAIR Axial
- T2 FS Axial
- GRE Cor
- T2 CISS Axial hires (1mm, ~56 slices, posterior fossa, foramen magnum through orbits)
- T2 FS Cor hires (behind pons through face)

**CONTRAST**

- T1 FS Cor hires post (behind pons through face)
- T1 FS Axial hires post (3x1mm, posterior fossa, foramen magnum through orbits)
- T1 FS Vibe Axial post

**NOTE:**

- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial

**BRAIN CSF FLOW**

**NOTE:** Do not perform on GE

**BRAIN SEIZURE (0-49 y/o) * 3T PREFERRED / SEE 3T PROTOCOL PAGE**

(50+y/o ONLY if ordered by neurologist specifically requesting SZ protocol)

** ** PEDI SEIZURE ** – mprage must include entire brain with air around skull for future MEG planning

- Diffusion Axial
- ** T1 3D FSPGR/MPRAGE Axial 1mm (MPR 3x0 Cor & Sag)
- FLAIR Axial
  - FLAIR Cor hires (include entire temporal lobe, 26+ slices)

**CONTRAST**

- T2 Spair FS Obl Cor hires (include entire temporal lobe, 26+ slices)
- T2 FS Axial
- GRE Cor
- T1 FS Vibe Axial post

**NOTE:**

- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial
- Post processing from T1 3D PSPGR/MPRAGE
  - MPR: 3x0mm Cor & Sag
- If patient is 50+y/o perform routine brain protocol.
- Optional sequence for Dr. Briggs, T2 SPACE FLAIR 3D Sag post.
BRAIN SEIZURE ICTAL SCAN (ST. DAVIDS)

Diffusion Axial
T1 3D FSPGR/MPRAGE Axial 1mm (MPR 3x0 Cor & Sag – mandatory for MIM software)
FLAIR Axial
FLAIR Cor hires (include entire temporal lobe, 26+ slices)
CONTRAST
T2 Obl Cor hires (include entire temporal lobe, 26+ slices)
T2 FS Axial
GRE Cor
T1 FS Cor post
T1 FS Axial post

NOTE:
- Create 3x0mm Cor & Sag MPR from T1 3D PSPGR/MPRAGE.

BRAIN MULTIPLE SCLEROSIS

T1 Sag
Flair Sag
PD T2 Axial (optional for UT Health)
Diffusion Axial
FLAIR Axial
CONTRAST
T2 FS Axial
GRE Cor
T2 FS Cor
T1 FS Vibe Axial post

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial
- Performed for UT Health group; Dr. Frohman, Dr. Melamed, Dr. Freeman, Dr. Meltzer, Dr. Bertelson, Teresa Frohman P.A., Ashlea Lucas P.A.
BRAIN NEUROQUANT
Diffusion Axial
T2 FLAIR Axial
T1 mprage Sag (Do not adjust parameters as set in scanner, no angle)
CONTRAST
T2 FS Axial
T2 FS Cor
GRE Cor
T1 FS Vibe Axial post

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor
  - Thin MIP: 6x0mm Axial
- Notify both Amy Shaw & Elianna Rivera in Image Library; IL will submit T1 mprage Sag to ClearCanvas to obtain reports.
- Reserve study in “Pending Documents” for 2 hours if done before 5pm. If done after hours, reserve for appropriate time allowing for at least 2 hours of processing time the following day.

BRAIN OR PITUITARY AUSTIN CA CTR THERAPY STAGING 3x0, skin to skin, no angle, full 100% FOV.
T1 Axial
T2 3D Axial
CONTRAST FULL DOSE
T1 Axial post
T1 3D FSPGR Axial post

BRAIN IACS NON-CONTRAST (cerebellopontine angle mass, tinnitus, hearing loss, dizziness)
T1 Sag
Diffusion Axial
Flair Axial
T2 FS Axial
GRE Cor
3D FSE T2 Axial hires (0.8mm CIC, CP, GTN, MPT, QRY, RCP) (IACs only, with 1mm Cor MPR)
T1 Axial hires (IACs only)

Note:
- Follow up / known schwannoma studies may be ordered without contrast (Dr. Kemper).
- Create 1mm Cor MPR from 3D FSE T2 Axial hires for non-contrast studies.
BRAIN IACS 7th Cranial Nerve (cerebellopontine angle mass, tinnitus, hearing loss, dizziness/vertigo, facial drooping/spasms/twitching, acoustic neuroma)

T1 Sag
Diffusion Axial
Flair Axial
T2 FS Axial
GRE Cor
3D FSE T2 Axial hires (0.8mm CIC, CP, GTN, MPT, QRY, RCP)
T1 Axial hires pre (IACs only)
CONTRAST
T1 FS Axial hires post (IACs only)
T1 FS Vibe Axial post (with MPRs)

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor
  - MPR: 1x0mm Cor, ~28 slices IACs only, with approximate 14-15cm zoom
  - Thin MIP: 6x0mm Axial
- Do not perform on RCP MR1, GE

BRAIN CHOLESTEATOMA

FLAIR Axial (include entire brain)
T2 FS Cor (3mm, anterior to IAC through mastoid)
T2 3D CISS Axial (1mm, above IAC through mastoid)
T2 HASTE Diffusion Cor B1000 (anterior to IAC through mastoid)
T2 HASTE Diffusion Axial B0
T2 HASTE Diffusion Axial B1000 (above IAC through mastoid)
T1 Axial 3mm pre (above IAC through mastoid)
CONTRAST
T1 FS Axial post (3mm, above IAC through mastoid)
T1 FS Cor post (3mm, anterior to IAC through mastoid)

NOTE:
- Avanto, Espree, or TIM Symphony only.
- This protocol is intended for “recurrent” or difficult to diagnose cholesteatomas by CT or otologic exam. Consult with a Radiologist if ordered for any other indication.
- Create HASTE Diffusion Axial ADC map.
  - Browser > Local, select both haste diff axial B0 & B1000 series, Evaluation > Dynamic Analysis > ADC, name series “haste diff axial adc”
PITUITARY Always to be scanned as an individual / free-standing exam.
Diffusion Axial
T1 Sag hires (14cm, 2mm, ~16 slices)
Flair Axial (include entire brain, use to prescribe True Cor/Sag)
T2 Cor hires (14cm, 2mm, ~16 slices)
T1 Cor hires pre
CONTRAST
T1 Cor hires post
T1 Sag hires post

NOTE: Symphony SM, WLK, WMC are programmed at 2.5mm for hires series.

NOTE: The following protocols: RTP, Stealth, Stryker, Cyberknife, & Stereotatic Therapy Planning Unless otherwise stated.
Do not angle images. Scan from inferior to superior. Entire brain skin to skin, include hard palate to skull vertex. Do not cut off tip of nose, top of head, or ear lobes. Smallest FOV to include patient’s external contours. 100% FOV/no rectangular FOV. Slice thickness of 1x0mm. Matrix of 256x256. Contrast full dose.

BRAIN RTP WITH CONTRAST (TO INCLUDE TOPA – TX ONCOLOGY REFERRING’s DR. WU / DR. TIERNEY / DR. SHEINBEIN)
T2 3D Space dark fluid Axial post (230 FOV, 1x0mm, 174x256, 5000 TR) *CSF suppressed
T1 3D Flash Axial post (230 FOV, 1x0mm, 206x256)

NOTE:
• Create 1mm Cor & Sag MPRs from both post sequences & send all to PACS.
• Both to be performed with interpolation on.
• Do not perform on GE, SW MR1 Symphony, SM Symphony, WLK Symphony, WMC Symphony.

BRAIN CRANIAL NERVE RTP WITH CONTRAST (TO INCLUDE TOPA – TX ONCOLOGY REFERRING’S DR. WU / DR. TIERNEY / DR. SHEINBEIN)
3D CISS Axial post (230 FOV, 1x0mm, 256x256)
T1 3D Flash Axial post (230 FOV, 1x0mm, 206x256)

NOTE:
• Create 1mm Cor & Sag MPRs from both post sequences & send all to PACS.
• Both to be performed with interpolation on.
• Do not perform on GE, SW MR1 Symphony, SM Symphony, WLK Symphony, WMC Symphony.

BRAIN STEREOTACTIC THERAPY PLANNING
T2 3D Axial
T1 3D Axial pre
T1 3D Axial post

NOTE: Commonly ordered by Dr. Dziuk & Dr. Thatikonda

BRAIN STEALTH WITH CONTRAST
T2 3D Axial CISS post
T1 3D VIBE Axial post

BRAIN STRYKER
T2 3D Axial
T1 3D Axial pre
T1 3D Axial post
BRAIN MOVEMENT DISORDER
T1 3D Vibe Sag (230 FOV, 1mm slice thickness, whole brain 160 slices/slab, create Cor MPR at 1x1mm)
Diffusion Axial
FLAIR Axial
CONTRAST
T2 FS Axial
GRE Cor
T2 FS Cor
T1 FS Vibe Axial post

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial
- Perform for Routine Brain order for Dr. Soileau.
- Previously known as Multiple System Atrophy (MSA Dr. Izor) Protocol. Performed to evaluate of middle cerebellar peduncle width.
- Include T1 3D Vibe Sag for all brain exams from Dr. Soileau, Dr. Izor, Dr. Eskew, Jordan Harbrath, NP

BRAIN FAST ACQUISITION
T2 HASTE / SSFSE Axial
T2 HASTE / SSFSE Sag

BRAIN SPINKS
T1 Sag
Diffusion Axial
FLAIR Axial
T1 Axial
T1 3D FSPGR/MPRAGE Axial (1mm, with Cor MPR)
T2 3D SPACE Sag (1mm, with Cor/Axial 1mm MPRs)
CONTRAST
T2 FS Axial
T2 FS Cor
GRE Cor

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial
**TMJ** Acquire sequences in this exact order, document # of cm open mouth.

- Left T1 Cor
- Left PD Sag
- Left T2 FS Sag
- Right T1 Cor
- Right PD Sag
- Right T2 FS Sag
- Right PD Sag open
- Left PD Sag open

Contrast: RA, infection, abscess, etc. Add following sequences post contrast.

- Left T1 FS Cor closed post
- Left T1 FS Sag closed post
- Right T1 FS Cor closed post
- Right T1 FS Sag closed post

**NOTE:**
- Open series performed with patient in maximum open mouth.
- Send axial localizer to PACS.

**TMJ WITH CINE** Acquire sequences in this exact order, document # of cm open mouth.

- Left T1 Cor
- Left PD Sag
- Left T2 FS Sag
- Right T1 Cor
- Right PD Sag
- Right T2 FS Sag
- Right PD Sag open
- Left PD Sag open

*The following sequences are to be centered mid-line joint space. Do not send the following sequences to PACS, only the resulting cine series.*

- PD tse sag bilat closed
- PD tse sag bilat bite (biting down)
- PD tse sag bilat 4mm
- PD tse sag bilat 8mm
- PD tse sag bilat 12mm
- PD tse sag bilat 16mm
- PD tse sag bilat 20mm
- PD tse sag bilat 24mm

**NOTE:**
- To create the cine, save the center slice from each of the 8 sequences into a separate sequence, named “RT PD Sag Cine” and/or “LT PD Sag Cine” in separate series. Once this is complete you will need to label each slice with the appropriate opening, “CLOSED” “BITE” “4MM”, etc. **Additional instructions.**
- Open series performed with patient in maximum open mouth.
- Send axial localizer to PACS.

Contrast for RA, infection, abscess, etc. Add following sequences post contrast.

- Left T1 FS Cor closed post
- Left T1 FS Sag closed post
- Right T1 FS Cor closed post
- Right T1 FS Sag closed post
ORBITS Always to be scanned as an individual / free-standing exam.
T1 Sag
Diffusion Axial
STIR Cor hires (mid-pons to mid-globe)
T1 Cor hires pre
CONTRAST
T1 FS Cor hires post
T1 FS Obl Axial hires post
T2 FS Obl Axial hires post

ORBITS (optic glioma)
T1 axial hires (3mm)
FLAIR Axial
STIR Cor hires (mid-pons to mid-globe)
CONTRAST
T1 FS Cor hires post
T2 FS obl Axial hires post
T1 3D FS Vibe post

NOTE:
- Post processing from T1 FS Vibe Axial post
  - MPR: 4x0mm Cor & Sag
  - Thin MIP: 6x0mm Axial

SETON NETWORK ONLY* ORBITS RETINOBLASTOMA
T2 spc Axial hires (1mm, 20cm FOV)
T1 Axial hires pre (3mm, 16cm FOV)
T2 spc Sag brain post (1.5mm, 25cm FOV)
T2 Axial brain post (4mm, 23cm FOV)
T2 Axial hires post (3mm, 16cm FOV)
T1 FS Axial hires post (3mm, 16cm FOV)
T2 starvibe Axial post (1mm, 16cm FOV)
T1 mpr Sag brain post (25cm FOV)
RT T1 FS Sag hires post (3mm, 16cm FOV)
LT T1 FS Sag hires post (3mm, 16cm FOV)

INTRACRANIAL MRA WITH 1ML CONTRAST
3D TOF Axial (include entire brain)

Note:
- All Intracranial MRAs should be done with 1ml of Gadolinium flushed with 10ml of saline.
- No iPAT / parallel imaging.
- Send raw data & MIPs to PACS.
  - Uncut Lateral & Tumble MIPs
  - Anterior Circulation Lateral & Tumble MIPs
  - Anterior Circulation Obl 1 & Obl 2 MIPs
  - Anterior Circulation Unilateral LT & RT Lateral MIPs
  - Posterior Circulation Lateral & Tumble MIPs
- Consult with a Radiologist with metallic dental work causing significant artifact. The Radiologist may prefer a CTA. If a CTA is preferred then the referring physician’s office should be notified for a change of orders prior to the patient being scanned.
**INTRACRANIAL MRV** Include entire skull.
Sag Localizer
GRE Cor
2D TOF Cor
3D Cor Volume pre
BOLUS CONTRAST: 10ML Gadavist, 20ML Multihance, 2 ml/sec
- 15ml normal saline flush. Axial slice centered at skull base, start post 5 seconds after observing contrast.
3D Cor Volume post (2x0 axial MPR)

NOTE:
- Subtract pre/post & use resulting subtraction for MIP lateral & tumble.
- Create 2x0 axial MPR from 3D Cor Volume post series.

**INTRACRANIAL MRV WITHOUT CONTRAST**
GRE Cor
2D TOF Cor
2D TOF Obl Sag (oblique 10 degrees from the midline brain to reduce the in-plane saturation effects)

NOTE: Add T1 Sag full brain, if patient does not have a concurrent brain exam.

**CAROTID MRA WITH CONTRAST**
Sag Localizer
2D TOF Axial (7mm slice thickness, 36-40 slices)
T1 FS Dixon Axial
3D Cor Volume pre
BOLUS FULL DOSE CONTRAST: 2ml/sec, 15ml normal saline flush
3D Cor Volume post

NOTE:
- Subtract pre/post & use resulting subtraction for MIP. Do not sends subtractions to PACS.
- Create R/L carotid & bilateral vertebral lateral MIP’s from the 3D TOF.
- 2mm, axial MPR from 3D Cor Volume post.
- If done in conjunction with an Intracranial MRA with contrast, the 2D TOF Axial & T1 FS Axial pre must be done prior to the administration of IV contrast.

**CAROTID MRA NON-CONTRAST**
Sag Localizer
2D TOF Axial (3mm slice thickness, -33% distance factor)
3D TOF Axial (centered at bifurcation)
T1 FS Dixon Axial

Note:
- Create R/L carotid & bilateral vertebral lateral MIP’s from the pre/post subtraction.
- If done in conjunction with an Intracranial MRA with contrast, the 2D TOF Axial and T1 FS Axial sequences must be done prior to the administration of IV contrast for the Intracranial MRA exam.
CERVICAL SPINE TRAUMA – HOSPITALS ONLY
T1 Sag
STIR Sag
T2 Sag
T2* GRE Axial (16cm, mid T1 to inferior tip of clivus)
T2 FS Axial (if hardware present, non-FS)
PD 3D Axial (14cm, 1mm, craniocervical junction)

NOTE:
- Limit FOV, not including more than T1-T2 in sagittal planes.
- Document presence or absence of radiculopathy with affected side.

CERVICAL SPINE
T1 Sag
STIR Sag
T2 Sag
T2* GRE Axial (16cm, mid T1 to inferior tip of clivus)
T2 FS Axial (if hardware present, non-FS)

NOTE:
- Limit FOV, not including more than T1-T2 in sagittal planes.
- Document presence or absence of radiculopathy with affected side.

CERVICAL WITH CONTRAST (myelopathy, MS, CA, etc.)
T1 Sag
STIR Sag
T2 Sag
T2* GRE Axial (16cm, mid T1 to inferior tip of clivus)
T2 FS Axial (if hardware present, non-FS)
CONTRAST
T1 FS Sag post
T1 Sag post (if hardware present)
T1 Axial post

NOTE:
- Limit FOV, not including more than T1-T2 in sagittal planes.
- Document presence or absence of radiculopathy with affected side.

SKULL BASE / FACE **3T PREFERRED
T1 Sag (200 FOV, 3x.5, ~42 slices)
T1 Axial (220 FOV, 3x.5, ~35 slices)
T2 FS Axial
STIR Cor (180 FOV, 3x1, ~50 slices)
CONTRAST
T1 FS Axial post
T1 FS Cor post

NOTE:
- Confirm protocol with radiologist before performing.
- Primarily used for facial lesions, include entire P>A / L>R diameter of skull / face, orbital roof through C1.
**SOFT TISSUE NECK** **3T Preferred**

- T1 Sag (5x1)
- T1 Axial (4x1)
- T2 FS Axial
- STIR Cor (5x1)

**CONTRAST**

- T1 FS Axial post (immediate post)
- T1 FS Dixon Cor post

**SOFT TISSUE NECK WITHOUT CONTRAST** **3T Preferred**

- T1 Sag (5x1)
- T1 Axial (4x1)
- T2 FS Axial
- STIR Cor (5x1)
- T1 Cor

**SOFT TISSUE NECK ACC THERAPY STAGING** 3x0, skin to skin, include entire anatomy, FOV to include all pathology

- T2 Axial
- T2 3D Axial

**CONTRAST**

- T1 Axial post
- T1 3D FSPGR Axial post

**SOFT TISSUE NECK MANDIBLE, DR. PETER SCHOLL**

- T1 Sag (5x1)
- T1 Axial (4x1)
- T2 FS Axial
- STIR Cor (5x1)

**T1 Sag hires** (2x0, 140 FOV, affected side, parallel to the long axis of the mandible)

**T1 Cor Hi-Res** (3x0, 160 FOV, affected side, perpendicular to the long axis of the mandible)

**T1 FS Axial post** (immediate post, 4x1)

- T1 Cor post (5x1)

**THORACIC SPINE**

- T1 Sag upper localizer (skull base through L1, see scout acquisition guidelines for details)
- T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
- T1 Sag
- STIR Sag
- T2 Sag

- T2 Axial Upper (16cm, 4x2, through mid C7)
- T2 Axial Lower (from mid L1 up)

**NOTE:**

- Document presence or absence of radiculopathy with affected side.
THORACIC SPINE WITH CONTRAST (myelopathy, MS, CA, SURG within 10 yrs., etc.)
T1 Sag upper localizer (skull base through L1, see scout acquisition guidelines for details)
T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
T1 Sag
STIR Sag
T2 Sag
T2 Axial Upper (16cm, 4x2, through mid T1)
T2 Axial Lower (4x2, mid L1 up)
CONTRAST
T1 FS Dixon Sag post (*in phase non-FS series if hardware present)
T1 Axial Upper post
T1 Axial Lower post

NOTE:
- Contrast with history of surgery within ten years.
- If hardware present send the in phase non-FS series to PACS.
- Document presence or absence of radiculopathy with effected side.

LUMBAR SPINE, ADULT 18+y/o
T1 Sag upper localizer (skull base through L1, see scout acquisition guidelines for details)
T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
T1 Sag
STIR Sag
T2 Sag
T2 Axial (180 FOV, 4x1, below L5-S1 disc to mid T12)
T1 Axial (180 FOV, 4x1, below L5-S1 disc to mid T12)
T2 Axial L5-S1 (parallel L5-S1 disc space)

NOTE:
- Document presence or absence of radiculopathy with effected side.
- Add additional T2 Axial sequence through L5-S1 or L4-L5 when the angle of those disk spaces requires a separate scan or pathology is seen.

LUMBAR SPINE WITH ANGLED AXIAL, ADULT 18+y/o
T1 Sag upper localizer (skull base through L1, see scout acquisition guidelines for details)
T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
T1 Sag
STIR Sag
T2 Sag
T2 Axial (180 FOV, 4x1, below L5-S1 disc to mid T12)
T1 Axial (180 FOV, 4x1, below L5-S1 disc to mid T12)

Specific to referring:
Dr. Wallis, Dr. Geibel: T2 Axial L1-S1 (5 slices per disc, centered & parallel to each disc space from L1 to S1)
Dr. Bergeson: T2 Axial mid L4 – mid S1 (single block parallel to disc spaces)

NOTE:
- Document presence or absence of radiculopathy with effected side.
- Providers: Dr. J.W. Wallis, Dr. Paul Geibel, & Dr. Ryan Bergeson
LUMBAR SPINE WITH CONTRAST, ADULT 18+y/o (myelopathy, MS, CA, SURG within 10 yrs., etc.)
T1 Sag upper localizer (skull base through L1, see scout acquisition guidelines for details)
T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
T1 Sag
STIR Sag
T2 Sag
T2 Axial (180 FOV, 4x1, below L5-S1 disc to mid T12)
T1 Axial pre (180 FOV, 4x1, below L5-S1 disc to mid T12)
T2 Axial L5-S1 (parallel L5-S1 disc space)
CONTRAST
T1 Axial post (below L5-S1 disc to mid T12)
T1 FS Sag post
T1 Sag post (if hardware present)

NOTE:
- Axials 200 FOV for A40 software scanners: WMC, SW 1.5T, WLK, SM.
- If hardware limits the FS on post imaging, include additional non-FS series.
- Document presence or absence of radiculopathy with effected side.
- Add additional T2 Axial sequence through L5-S1 or L4-L5 when the angle of those disk spaces requires a separate scan or pathology is seen.

SPINE SCOLIOSIS Only if scoliosis is specifically stated on the referral
Routine Protocol
Adults: T1 Cor
Pedi: T2 Cor

SPINE STEREOTACTIC THERAPY PLANNING, DR. DZIUK & DR. THATIKONDA
T1 Sag upper localizer (C2 through L1, see scout acquisition guidelines for details)
T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
T2 3D Axial
CONTRAST
T1 3D Axial pre
T1 3D Axial post

NOTE:
- 180 FOV, 1-2mm slice thickness depending on requested coverage, do not angle images.
- The full spine scouts are not necessary on cervical spine studies.

SPINE STRYKER
T1 Sag upper localizer (C2 through L1, see scout acquisition guidelines for details)
T1 Sag lower localizer (T10 through S2, see scout acquisition guidelines for details)
T2 Axial
CONTRAST
T1 Axial pre
T1 Axial post

NOTE:
- Do not angle images. Image inferior to superior, including one vertebra above and below area of interest. FOV to encompass the region of interest, no rectangular FOV. 3.0, 256 x 256.
- Patient should be positioned Feet First Supine.
- The full spine scouts aren’t necessary on Cervical Spine studies.
**BRACHIAL PLEXUS** Affected side only.
T1 Axial
STIR Axial
T1 Cor Obl
STIR Cor Obl
T1 Sag (FOV to include top of C1)
STIR Cor (large FOV, include both sides)

Contrast: mass, infection or post-op tumor.
T1 FS Axial post
T1 FS Cor Obl

**NEURO PELVIS - LUMBOSACRAL PLEXUS** *3T PREFERRED, SEE 3T PROTOCOL PAGE*
T1 Axial (perpendicular to sacrum)
T2 FS Axial
T1 Cor (parallel to sacrum)
T2 FS Cor
T1 Sag
T2 FS Sag