



CLINICAL GUIDELINES

Spine Imaging Policy

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eviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or individual's Primary Care Physician (PCP) may provide additional insight.

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SPINE IMAGING GUIDELINES

SP General Guidelines	
Procedure Codes	3
SP-1~GENERAL GUIDELINES	4
SP-2~IMAGING TECHNIQUES	10
SP-3~NECK (CERVICAL SPINE) PAIN without/with NEUROLOGICAL FEATURES and TRAUMA	18
SP-4~UPPER BACK (THORACIC SPINE) PAIN without/with NEUROLOGICAL FEATURES and TRAUMA	21
SP-5~LOW BACK (LUMBAR SPINE) PAIN/COCCYDYNIA without NEUROLOGICAL FEATURES	23
SP-6~LOWER EXTREMITY PAIN WITH NEUROLOGICAL FEATURES (RADICULOPATHY, RADICULITIS, OR PLEXOPATHY AND NEUROPATHY) WITH OR WITHOUT LOW BACK (LUMBAR SPINE) PAIN	26
SP-7~Myelopathy	29
SP-8~LUMBAR SPINE SPONDYLOLYSIS/SPONDYLOLISTHESIS	30
SP-9~LUMBAR SPINAL STENOSIS	32
SP-10~SACRO-ILIAC (SI) JOINT PAIN, INFLAMMATORY SPONDYLITIS/SACROILIITIS and FIBROMYALGIA	33
SP-11~PATHOLOGICAL SPINAL COMPRESSION FRACTURES	35
SP-12~SPINAL PAIN in CANCER PATIENTS	36
SP-13~SPINAL CANAL/CORD DISORDERS (e.g. SYRINGOMYELIA)	37
SP-14~SPINAL DEFORMITIES (e.g. SCOLIOSIS/KYPHOSIS)	38
SP-15~POST-OPERATIVE SPINAL DISORDERS	40
SP-16~OTHER IMAGING STUDIES and PROCEDURES RELATED to the SPINE IMAGING GUIDELINES	42
SP-17~NUCLEAR MEDICINE	44

SPINE IMAGING GUIDELINES

Procedure Codes associated with Spine Imaging	
MRI/MRA	CPT®
Cervical MRI without contrast	72141
Cervical MRI with contrast	72142
Cervical MRI with and without contrast	72156
Thoracic MRI without contrast	72146
Thoracic MRI with contrast	72147
Thoracic MRI with and without contrast	72157
Lumbar MRI without contrast	72148
Lumbar MRI with contrast	72149
Lumbar MRI without and with contrast	72158
Spinal MRA	72159
MRI Pelvis without contrast	72195
MRI Pelvis with contrast	72196
MRI Pelvis with and without contrast	72197
CT	CPT®
Cervical CT without contrast	72125
Cervical CT with contrast (Post-Myelography CT)	72126
Cervical CT without and with contrast	72127
Thoracic CT without contrast	72128
Thoracic CT with contrast (Post-Myelography CT)	72129
Thoracic CT without and with contrast	72130
Lumbar CT without contrast (Post-Discography CT)	72131
Lumbar CT with contrast (Post-Myelography CT)	72132
Lumbar CT without and with contrast	72133
CT Pelvis without contrast	72192
CT Pelvis with contrast	72193
CT Pelvis with and without contrast	72194
Ultrasound	CPT®
Spinal canal ultrasound	76800

SP-1~GENERAL GUIDELINES

SP-1.1 General Considerations

Before advanced diagnostic imaging can be considered, there must be an initial face-to-face clinical evaluation as well as a clinical re-evaluation after a trial of failed conservative therapy; the clinical re-evaluation may consist of a face-to-face evaluation or other meaningful contact with the provider's office such as email, web or telephone communications.

A face-to-face clinical evaluation is required to have been performed within the last 60 days before advanced imaging is considered. This may have been either the initial clinical evaluation or a clinical re-evaluation.

The initial clinical evaluation should include a relevant history and physical examination (including a detailed neurological examination), appropriate laboratory studies, non-advanced imaging modalities, results of manual motor testing, the specific dermatomal distribution of altered sensation, reflex examination, and nerve root tension signs (Lasegue's Test). *The initial clinical evaluation must be face-to-face; other forms of contact (telephone call, electronic mail or messaging) are not acceptable as an initial evaluation.*

- For those spinal conditions/disorders for which the Spine Imaging Guidelines require a plain x-ray of the spine prior to consideration of an advanced imaging study, the plain x-ray must be performed after the current episode of symptoms started or changed (see **SP-2.1**).

Clinical re-evaluation is required prior to consideration of advanced diagnostic imaging to document failure of significant clinical improvement following a recent (within 3 months) six week trial of physician-directed treatment.* Clinical re-evaluation can include documentation of a face-to-face encounter or documentation of other meaningful contact with the requesting provider's office by the patient.

- Physician-directed treatment may include education, activity modification, NSAIDs (non-steroidal anti-inflammatory drugs), narcotic and non-narcotic analgesic medications, oral or injectable corticosteroids, a physician-directed home exercise/stretching program, cross-training, avoidance of aggravating activities, physical/occupational therapy, spinal manipulation, interventional pain procedures and other pain management techniques.

Any bowel/bladder abnormalities or emergent or urgent indications should be documented at the time of the initial clinical evaluation and clinical re-evaluation.

Altered sensation to pressure, pain, and temperature should be documented by the specific anatomic distribution (for example, dermatomal and stocking/glove).

Motor deficits (weakness) should be defined by the specific myotomal distribution (for example, weakness of toe flexion/extension, knee flexion/extension, ankle dorsi/plantar flexion, wrist dorsi/palmar flexion) and gradation of muscle testing should be documented as follows:

Grading of Manual Muscle Testing	
0	No evidence of muscle function
1	Muscle contraction but no or very limited joint motion
2	Movement possible with gravity eliminated
3	Movement possible against gravity
4	Movement possible against gravity with some resistance
5	Movement possible against gravity with full or normal resistance

Pathological reflexes (e.g. positive Hoffmann’s, Babinski, and Chaddock Sign), asymmetric reflexes and reflex examination should be documented as follows:

Grading of Reflex Testing	
0	No response
1+	A slight but definitely present response
2+	A brisk response
3+	A very brisk response without clonus
4+	A tap elicits a repeating reflex (clonus)

Advanced diagnostic imaging is often urgently indicated and may be necessary if serious underlying spinal and/or non-spinal disease is suggested by the presence of certain patient factors referred to as “red flags.” See: (**SP-1.2 Red Flag Indications**)

Spinal specialist evaluation can be helpful in determining the need for advanced diagnostic imaging, especially for patients following spinal surgery.

The need for repeat advanced diagnostic imaging should be carefully considered and may not be indicated if prior advanced diagnostic imaging has been performed. Requests for simultaneous, similar studies such as spinal MRI and CT need to be documented as required for preoperative surgical planning. These studies may be helpful in the evaluation of complex failed spinal fusion cases or needed for preoperative surgical planning when the determination of both soft tissue and bony anatomy is required.

Serial advanced imaging, whether CT or MRI, for surveillance of healing or recovery from spinal disease is not supported by the currently available scientific evidence-based medicine for the majority of spinal disorders.

Advanced imaging is generally unnecessary for resolved or improving spinal pain and/or radiculopathy.

For patients experiencing chronic spine pain, advanced diagnostic imaging has not been shown to be of value in patients with stable, longstanding spinal pain without

neurological features or without clinically significant or relevant changes in symptoms or physical examination findings.

SP-1.2 Red Flag Indications

Red Flag Indications are intended to represent the potential for life or limb threatening conditions. Red Flag Indications are clinical situations in which localized spine pain and associated neurological features are likely to reflect serious underlying spinal and/or non-spinal disease and warrant exception to the requirement for documented failure of six weeks of physician-directed treatment. Advanced diagnostic imaging of the symptomatic level is appropriate and/or work-up for a non-spinal source of spine pain for Red Flag Indications.

Red Flag Indications include:

- Motor Weakness
- Aortic Aneurysm or Dissection
- Cancer
- Cauda Equina Syndrome
- Fracture
- Infection
- Severe Radicular Pain

Motor Weakness (See: Grading of Manual Muscle Testing and Reflex Testing in **SP 1.1**)

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
Clinical presentation including one or more of the following: <ul style="list-style-type: none"> • Motor weakness of grade 3/5 or less of specified muscle(s); • New onset foot drop; • Acute bilateral lower extremity weakness; • Progressive objective motor /sensory/deep tendon reflex deficits on clinical re-evaluation 	MRI of the relevant spinal level without contrast or MRI of the relevant spinal level without and with contrast

Aortic Aneurysm or Dissection

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<ul style="list-style-type: none"> • Acute incapacitating back/abdominal pain; <i>and</i> • History and/or risk factors for coronary artery disease and peripheral vascular disease. 	See: <u>AB-18</u> through <u>AB-19</u> in the Abdomen Imaging Guidelines and/or <u>CH-30</u> in the Chest Imaging Guidelines

Cancer

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>Clinical presentation including one or more of the following:</p> <ul style="list-style-type: none"> • There is a clinical suspicion of spinal malignancy AND one or more of the following: <ul style="list-style-type: none"> ○ Night pain ○ Uncontrolled or unintended weight loss ○ Pain unrelieved by change in position ○ Age greater than 70 years ○ Severe and worsening spinal pain despite a reasonable (generally after 1 week) trial of physician-directed non-surgical care or observation with re-evaluation; or • Known metastatic malignancies; or Acute spinal cord compression from primary or metastatic spinal neoplastic disease is suspected by history and physical examination. 	<p>MRI of the relevant spinal level without contrast or MRI of the relevant spinal level without and with contrast; CT without contrast of the relevant spinal level if MRI contraindicated.</p> <p>See also: ONC-31.5 and ONC-31.6 in the Oncology Imaging Guidelines.</p>

Cauda Equina Syndrome

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>Clinical presentation including one or more of the following:</p> <ul style="list-style-type: none"> • Acute onset of bilateral sciatica; • Perineal sensory loss (“saddle anesthesia”); • Decreased anal sphincter tone; • Bowel /bladder incontinence; • Acute urinary retention. 	<p>MRI Lumbar Spine without contrast (CPT[®] 72148) or MRI Lumbar Spine without and with contrast (CPT[®] 72158)</p>

Fracture

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>There is clinical suspicion of spinal fracture related to one or more of the following:</p> <ul style="list-style-type: none"> • Long term use of systemic glucocorticoids; • History of prior low energy fractures; • History of low bone mineral density; • Age older than 70 years; • Recent significant trauma at any age; • High speed vehicular accident; • Ejection from a motor vehicle; • Fall from a substantial height. 	<p>MRI of the relevant spinal level without contrast or CT of the relevant spinal level without contrast</p>

Infection

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>There is a clinical suspicion of spinal infection and one or more of the following:</p> <ul style="list-style-type: none"> • Fever; • History of IV drug use; • Recent bacterial infection (UTIs, pyelonephritis, pneumonia); • Immunocompromised states; • Long term use of systemic glucocorticoids; • Organ transplant recipient taking anti-rejection medication; • Diabetes mellitus; • HIV/AIDS; • Chronic dialysis; • Immunosuppressant therapy; or • Clinical suspicion of disc space infection, epidural abscess or spinal osteomyelitis. 	<p>MRI of the relevant spinal level without and with contrast or MRI without contrast</p>

Severe Radicular Pain

All of the following must be present (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<ul style="list-style-type: none"> • Severe radicular pain in a specified spinal nerve root distribution (minimum 9/10 on the VAS); and • Documented significant functional loss at work or at home; and • Severity of pain unresponsive to a minimum of seven (7) days of physician-directed treatment; and • Treatment plan includes a transforaminal epidural steroid injection (TFESI) at any level(s) or an interlaminar epidural steroid injection (ILESI) at the cervical or thoracic levels or a plan for urgent/emergent spinal surgery. 	<p>MRI of the relevant spinal level without and with contrast or MRI without contrast</p>

SP-1.3 Definitions

- ✓ **Radiculopathy**, for the purpose of this policy, is defined as the presence of pain, dysaesthesia(s) or paraesthesia(s) reported by the individual in a specified dermatomal distribution of an involved named spinal root(s) causing significant functional limitations resulting in diminished quality of life and impaired, age-appropriate activities of daily living, **and ONE or MORE** of the following:
- Documented loss of strength of specific named muscle(s) or myotomal distribution(s) or demonstrated on detailed neurologic examination (within the prior 3 months), concordant with nerve root compression of the involved named spinal nerve root(s).
 - Documented altered sensation to light touch, pressure, pin prick or temperature demonstrated on a detailed neurologic examination (within the

- prior 3 months) in the sensory distribution concordant with nerve root compression of the involved named spinal nerve root(s).
- Documented diminished, absent or asymmetric reflex(es) within the prior 3 months concordant with nerve root compression of the involved named spinal nerve root(s).
 - Documentation of either of the following:
 - A concordant radiologist's interpretation of an advanced diagnostic imaging study (MRI or CT) of the spine demonstrating compression of the involved named spinal nerve root(s) or foraminal stenosis at the concordant level(s) (Performed within the prior 12 months).
 - Electrodiagnostic studies (EMG/NCV's) diagnostic of nerve root compression of the involved named spinal nerve root(s). (Performed within the prior 12 months).
- ✓ **Radicular pain** is pain which radiates to the upper or lower extremity along the course of a spinal nerve root, typically resulting from compression, inflammation and/or injury to the nerve root.
- ✓ **Radiculitis** is defined, for the purpose of this policy, as radicular pain without objective neurological findings.

References

1. Devin CJ, McCullough KA, Morris BJ, et al. Hip-spine syndrome. J Am Acad Orthrop Surg, 2012;20:434-442.
2. Patel ND, Broderick DF Burns J, et al. ACR Appropriateness Criteria Low Back Pain, Journal of the American College of Radiology, Volume 13, Number 9, September 2016

SPINE IMAGING GUIDELINES

SP-2~IMAGING TECHNIQUES

SP-2	IMAGING TECHNIQUES	
SP-2.1	Anatomic Guidelines	11
SP-2.2	MRI of the Spine	11
SP-2.3	CT of the Spine	12
SP-2.4	CT/Myelography	12
SP-2.5	Provocative Discography CT	13
SP-2.6	Ultrasound of the Spinal Canal	14
SP-2.7	Limitations of Spinal Imaging in Degenerative Disorders	14
SP-2.8	Miscellaneous Spinal Lesions	15
SP-2.9	MRA Spinal Canal	15
SP-2.10	Spine PET	16

SP-2~IMAGING TECHNIQUES

SP-2.1 Anatomic Guidelines

Anatomic regions of the spine/pelvis that are included in the following MRI and CT advanced diagnostic imaging studies:

- Cervical spine: from the skull base/foramen magnum through T1
- Thoracic spine: from C7 through L1
- Lumbar spine: from T12 through mid-sacrum
- Pelvis: includes hips, sacroiliac joints, sacrum, coccyx

CT or MRI of the cervical and thoracic spine will image the entire spinal cord since the end of the spinal cord or conus medullaris usually ends at L1 in adults. Therefore, lumbar spine imaging is not needed when the goal is to image only the spinal cord unless there is known or suspected low lying conus medullaris (e.g. tethered cord).

Plain x-ray should be the initial evaluation for certain suspected spine conditions, including:

- Pathological compression fractures (see **SP-11**)
- Lumbar Spondylolysis/Spondylolisthesis (see **SP-8**)
- Ankylosing Spondylitis (see **SP-10**)
- Cervical, Thoracic, and Lumbar Trauma (see **SP-3**, **SP-4**, **SP-6**)
- Scoliosis/Kyphosis and other spinal deformities (see **SP-14** and **PACSP-4**)
- Sacroiliac joint conditions (see **SP-10**)
- Post-operative spinal disorders (see **SP-15**)

SP-2.2 MRI of the Spine

(See **SP-1 Procedure Codes Associated with Spine Imaging**)

Spine MRI is the procedure of choice to evaluate disc disease, spinal cord and nerve root disorders and most other spinal conditions including evaluation of congenital anomalies of the spine and spinal cord.

Spine MRI is performed either without contrast, with contrast *or* without and with contrast. A “with contrast” study alone is appropriate only to complete a study begun without contrast. Contrast is generally not indicated for most disc and nerve root disorders, fractures and degenerative disease.

The following are indications for MRI without contrast or MRI without and with contrast (When MRI is contraindicated, CT spine without contrast, CT spine with contrast, or CT myelography):

- Suspicion for or surveillance of known spine/spinal canal/spinal cord neoplastic disease.
- Suspicion, diagnosis of or surveillance of spinal infections, multiple sclerosis or other causes of myelitis, syringomyelia, cauda equina syndrome or other “red flag” indications (See **SP-1.2 Red Flag Indications**).
- Spinal imaging for patients having undergone recent spinal surgery e.g., laminectomy, discectomy, spinal decompression, when history and physical examination is suspicious for hematoma, post-surgical infection, or cerebrospinal fluid (CSF) leak.

Positional MRI:

Positional MRI is also referred to as dynamic, weight-bearing or kinetic MRI. Currently, there is inadequate scientific evidence to support the medical necessity of this study. As such, it should be considered experimental or investigational (see **HD-24.6**).

SP-2.3 CT of the Spine

(See **SP-1 Procedure Codes Associated with Spine Imaging**)

CT Spine:

Spine CT is useful for defining bony anatomy and detail.

Spine CT indications include:

- Individuals who cannot have MRI (with implanted ferromagnetic materials or electronically, magnetically or mechanically activated implanted devices that are not determined by the manufacturer as MRI compatible).
- Any spinal trauma/fractures, especially spinal trauma/fractures that could result in spinal instability and spinal cord/spinal nerve compression.
- Spinal neoplastic disease – primary or metastatic.
- In conjunction with myelography or discography (See **SP-2.4** and **SP-2.5**).
- To assess spinal fusions when pseudoarthrosis is suspected (not to be used for routine post-operative assessment where x-rays are sufficient and/or there are no concordant clinical signs or symptoms).
- Congenital, developmental or acquired spinal deformity (see **SP-14~Scoliosis**).
- Preoperative evaluation to define abnormal or variant spinal anatomy that could influence the outcome of a potential surgical procedure.
- Spondylolysis when routine x-rays are negative and/or MRI is equivocal, indeterminate or non-diagnostic (see **SP-8 Spondylolysis/Spondylolisthesis**).

SP-2.4 CT/Myelography

(See **SP-1 Procedure Codes Associated with Spine Imaging**)

CT/Myelography:

CT/Myelography is generally unnecessary as an initial study when a diagnostic quality MRI has been obtained.

CT/Myelography indications include:

- To clarify equivocal, indeterminate or non-diagnostic MRI findings or to further evaluate the significance of multiple spinal abnormalities.
- When an MRI is contraindicated (See **SP-2.2 MRI of the Spine**).
- Preoperative planning for spine surgery, (e.g., multilevel spinal stenosis or when a previous MRI is insufficient, equivocal, indeterminate or non-diagnostic).
- Evaluation after previous spinal surgery when an MRI without and with contrast is contraindicated or MRI results are equivocal, indeterminate or non-diagnostic.
- To evaluate calcified lesions, (e.g., osteophytes, ossification of the posterior longitudinal ligament [OPLL]).
- eviCore authorizes only the post-myelogram CT (i.e., CPT[®] 72126, CPT[®] 72129, and CPT[®] 72132) and not any other myelogram-related procedure codes (i.e., CPT[®] 72265 or CPT[®] 62284).
 - Providers may be required to obtain prior authorization for myelogram-related procedure codes and requirements may vary by health plan payer.
 - Providers are urged to obtain written instructions and prior authorization requirements directly from each health plan payer for myelogram-related procedure codes.

SP-2.5 Lumbar Provocative Discography CT

Provocative Discography/CT:

- ✓ eviCore authorizes only the post-lumbar discography CT procedure codes and not any other discography-related procedure codes. A post lumbar discography CT is considered medically necessary following an approved discography and ALL of the following apply:
 - A post-discogram CT is coded as without contrast.
 - A CT lumbar spine without contrast (CPT[®] 72131) is appropriate if verified to be performed as a post-discogram CT.
 - When a post-discography CT is requested and the discography has already been approved EviCore will issue authorization for the post-discography CT procedure codes.

Practice Notes

Provocative Discography/CT is a controversial procedure purported to diagnose (or rule-out) a discogenic “pain generator.” i.e., the source of non-specific axial spinal pain. This diagnostic study, when reported as positive, is often used as an indication for spinal fusion in patients with non-specific axial back pain.

The following uses of discography are considered controversial:

- To identify a symptomatic pseudoarthrosis in a failed spinal fusion.
- To identify which of two herniated discs seen on MRI is symptomatic when not determined clinically or otherwise.
- To confirm the discogenic nature of pain in a patient with an abnormal disc seen on MRI and to rule out pain from an adjacent disc level.
- To confirm the presumptive diagnosis of “internal disc disruption”.
- Discography of the cervical and/or thoracic spine.

SP-2.6 Ultrasound of the Spinal Canal

Spinal canal ultrasound (CPT[®] 76800) describes the evaluation of the spinal cord (canal and contents) most often performed in newborns, infants, young children and intraoperatively.

CPT[®] 76800 describes evaluation of the entire spine and should not be reported multiple times for imaging of different areas of the spinal canal.

CPT[®] 76998, rather than CPT[®] 76800, should be used to report intraoperative spinal canal ultrasound (ultrasonic guidance). Intraoperative use of spinal ultrasound (CPT[®] 76998) would not require prior authorization by eviCore.

Indications for spinal canal ultrasound (CPT[®] 76800):

This study is generally limited to infants, newborns and young children because of incomplete ossification of the vertebral segments surrounding the spinal cord, including the assessment of CSF in the spinal canal and for image-guided lumbar puncture.

When ossification of the vertebral segments is incomplete for evaluation of suspected or known tethered cord (see **PEDSP-5~Tethered Cord**).

Evaluation of suspected occult and non-occult spinal dysraphism (see **PEDSP-4~Spinal Dysraphism**).

Evaluation of spinal cord tumors, vascular malformations and cases of birth-related trauma.

Contraindicated for use in the adult spine for the assessment of spinal pain, radiculopathy, facet inflammation, nerve root inflammation, disc herniation, and soft tissue conditions surrounding the adult spine other than for superficial masses

SP-2.7 Limitations of Spinal Imaging in Degenerative Disorders

Non-specific axial spinal pain is ubiquitous. Advanced diagnostic imaging infrequently identifies the source of the spinal pain (pain generator).

Incidental findings on MRI and CT, including bulging, protruding, extruding or herniated discs, are often non-concordant, asymptomatic and increase in incidence as the spine ages.

In individuals with poorly defined clinical presentations, “abnormal” spinal advanced diagnostic imaging results are infrequently clinically concordant, significant, material or substantive and may even lead to inappropriate treatment.

Performing advanced spinal imaging based only on the presence of spinal degenerative findings identified on x-rays is not generally indicated in patients who are either asymptomatic or present with non-specific axial spinal pain.

SP-2.8 Miscellaneous Spinal Lesions

Vertebral body hemangiomas:

Vertebral body hemangiomas are common and are generally benign and incidental findings on plain x-rays and advanced diagnostic imaging studies.

If the appearance of a vertebral body hemangioma is typical on plain x-ray, further spinal advanced diagnostic imaging is not usually required, unless there are associated neurologic symptoms or signs on physical examination.

If the appearance of a vertebral body hemangioma is atypical on plain x-ray, (with or without neurological signs or symptoms on physical exam, MRI without contrast or MRI without and with contrast is indicated.

Occasionally, MRI may be equivocal, indeterminate or non-diagnostic and CT without contrast of the spinal area is indicated to help clarify the diagnosis.

No follow-up imaging is necessary once the diagnosis of a vertebral body hemangioma is established without neurological features.

Tarlov cysts:

Tarlov cysts are most often cystic dilatations of nerve root sleeves in the lumbar spine and sacrum.

Controversy exists as to whether Tarlov cysts can result in neurologic signs and symptoms but they can result in erosion of the adjacent bone.

Usually Tarlov cysts are benign, incidental findings on advanced diagnostic imaging studies. Further evaluation of a known or suspected Tarlov cyst can be performed with a MRI without and with contrast study (CPT[®] 72158) or with Lumbar CT/Myelography (CPT[®] 72132).

Other spinal lesions:

MRI without and with contrast or a CT without contrast is appropriate if:

- Other spinal lesions are seen on routine x-rays or a non-contrast MRI; *and*
- These additional advanced imaging studies are recommended by a spine specialist or radiologist to further characterize or diagnose the lesion; *or*
- Required for surgical planning.

SP-2.9 MRA Spinal Canal

All requests for spinal MRA will be forwarded for Medical Director Review.

Spine MRA imaging is utilized infrequently.

Cerebrospinal Fluid (CSF) flow studies using MRI are included in the CPT[®] code set 70551-70553 and should not be coded or reported separately.

Indications may include:

Suspected spinal cord arteriovenous malformation (AVM) or arteriovenous fistula (AVF):

- Spine MRI of the relevant spine region without and with contrast should be the initial imaging study.
- If suspicion for a spinal AVM or AVF is high based upon the results of the spine MRI, catheter angiography is recommended (CPT[®] 72159 or CPT[®] 70496).
- ✓ Subarachnoid hemorrhage where no brain aneurysm has been previously identified
 - Catheter angiography (CPT[®] 70496) should be performed and is the most definitive study to define possible spinal pathology resulting in a spinal canal subarachnoid hemorrhage.
 - See: **HD-1.5 General Guidelines**
 - See: **HD 12.1 Intracranial Aneurysms and AVM**
- ✓ Preoperative planning
 - Spinal canal MRA may be useful in identifying major intercostal feeder vessels to the spinal cord prior to surgical procedures that might interfere with this blood supply to the spinal cord. However, catheter angiography (CPT[®] 72159) is generally a more definitive study for this purpose.

SP-2.10 Spine PET

- ✓ At the present time there is controversy regarding spine PET due to inadequate scientific evidence to support the medical necessity of PET for the routine assessment of spinal disorders, other than for neoplastic disease.
- ✓ (See **Oncology Imaging Guidelines**)
- ✓ SPECT has been described to identify spinal pain generators, pseudoarthrosis of spinal fusion or hardware failure when conventional advanced diagnostic imaging studies are inconclusive, non-diagnostic or equivocal. Requests for SPECT will be reviewed on a case-by-case basis by the Medical Director.
- ✓ Spine PET should be considered experimental or investigational and will be forwarded to Medical Director Review.

References

1. American Academy of Neurology. Review of the literature on spinal ultrasound for the evaluation of back pain and radicular disorders. Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology*. 1998; 51:343-344. Reaffirmed July 13, 2013.
2. North American Spine Society (NASS). Diagnosis and treatment of lumbar disc herniation with radiculopathy. Technical Report. 2012. Available at: <https://www.spine.org/researchclinicalcare/qualityimprovement/clinicalguidelines.aspx>. Accessed May 31, 2016.

SPINE IMAGING GUIDELINES

SP-3~NECK (CERVICAL SPINE) PAIN without/with NEUROLOGICAL FEATURES and TRAUMA

SP-3.1: Neck (Cervical Spine) Pain without and with Neurological Features

<i>All of the following are required prior to advanced imaging:</i>	
<ul style="list-style-type: none"> • Initial clinical evaluation performed. • A face-to-face evaluation within the last 60 days. • The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.. 	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1)	
Advanced Diagnostic Imaging:	MRI Cervical Spine, without contrast (CPT [®] 72141).
Comments:	CT Cervical Spine without contrast (CPT [®] 72125) or CT Myelography (CPT [®] 72126) is appropriate when MRI is contraindicated.

SP-3.2: Neck (Cervical Spine) Trauma

<i>All of the following are required prior to advanced imaging:</i>	
<ul style="list-style-type: none"> • Initial clinical evaluation performed. • A face-to-face evaluation within the last 60 days. • The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation	
Clinical re-evaluation after treatment period(may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1)	
Plain x-rays of cervical spine negative for fracture	
Advanced Diagnostic Imaging:	MRI Cervical Spine without contrast (CPT [®] 72141) or CT Cervical Spine without contrast (CPT [®] 72125). For patients with ankylosing spondylitis, both MRI Cervical Spine without contrast (CPT [®] 72141) and CT Cervical Spine without contrast (CPT [®] 72125) can be approved.
Comments:	Plain x-rays and a 6 week trial of physician-directed treatment and/or observation and clinical re-evaluation are <i>not</i> required for patients with a high risk mechanism of cervical spine injury within the last 3 months (See below**).

**High risk mechanisms of cervical spine injury may include:

- Head trauma and/or maxillofacial trauma
- Pedestrian in a motor vehicle accident
- Fall from above standing height
- Diving accident
- Head-on motor vehicle collision without/with airbag deployment
- Rollover motor vehicle collision
- Ejection from the vehicle in a motor vehicle collision
- High speed of the vehicle at the time of collision
- Not wearing a seatbelt/shoulder harness in a motor vehicle collision
- Patients with ankylosing spondylitis are at high risk of cervical spine fractures even with minor direct/indirect trauma to the cervical spine which can result in quadriparesis/quadriplegia

✓ **Red Flag Indications:** See **SP-1.2 Red Flag Indications**

Practice Notes:

Pain radiation patterns from the cervical spine area into the thoracic spine area do not necessarily justify the addition of thoracic spine advanced diagnostic imaging. Cervical radiculopathy is often confused with shoulder disorders, brachial plexopathy, peripheral nerve entrapment and/or motor/sensory neuropathies. Electrodiagnostic testing (EMGs/NCVs) is generally used to confirm, not establish, a diagnosis of peripheral nerve entrapment and/or a motor/sensory neuropathy based upon history and physical examination findings. Electrodiagnostic testing is often considered when advanced imaging of the spine does not reveal neurocompressive pathology and/or after 6 weeks of unimproved symptoms of extremity pain, weakness, numbness and/or tingling.

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SPINE IMAGING GUIDELINES

SP-4~UPPER BACK (THORACIC SPINE) PAIN without/with NEUROLOGICAL FEATURES and TRAUMA

SP 4.1: Upper Back (Thoracic Spine) Pain without and with Neurological Features

<i>All of the following are required prior to advanced imaging:</i>	
<ul style="list-style-type: none">• Initial clinical evaluation performed.• A face-to-face evaluation within the last 60 days.• The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1).	
Advanced Diagnostic Imaging:	MRI Thoracic Spine without contrast (CPT [®] 72146).
Comments:	A CT Thoracic spine without contrast (CPT [®] 72128) <i>or</i> CT Myelography (CPT [®] 72129) is appropriate when MRI is contraindicated.

SP 4.2: Upper Back (Thoracic Spine) Trauma

<i>All of the following are required prior to advanced imaging:</i>	
<ul style="list-style-type: none">• Initial clinical evaluation performed.• A face-to-face evaluation within the last 60 days.• The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1).	
Plain x-rays of thoracic spine negative for fracture.	
Advanced Diagnostic Imaging:	MRI Thoracic Spine without contrast (CPT [®] 72146) <i>or</i> CT Thoracic Spine without contrast (CPT [®] 72128).

- ✓ Red Flag Indications: See **SP-1.2 Red Flag Indications**
- ✓ Thoracic spine radiculopathy often presents with pain radiation from the thoracic spine around the rib cage following the sensory distribution of an intercostal nerve.
- ✓ Advanced diagnostic imaging is generally not appropriate in evaluation of axial low back pain with radiation toward the thoracic region unless there are documented clinical features indicating a thoracic spine disorder.

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SPINE IMAGING GUIDELINES

SP-5~LOW BACK (LUMBAR SPINE) PAIN/COCCYDYNIA without NEUROLOGICAL FEATURES

SP 5.1: Low Back (Lumbar Spine) Pain without Neurological Features

<i>All</i> of the following are required prior to advanced imaging:	
<ul style="list-style-type: none">• Initial clinical evaluation performed.• A face-to-face evaluation within the last 60 days.• The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1).	
Advanced Diagnostic Imaging:	MRI Lumbar Spine without contrast (CPT [®] 72148)
Comments:	A CT lumbar spine without contrast (CPT [®] 72131) or CT Myelography (CPT [®] 72132) is appropriate when MRI is contraindicated

SP 5.2: Coccydynia without Neurological Features

<i>All</i> of the following are required prior to advanced imaging:	
<ul style="list-style-type: none">• Initial clinical evaluation performed.• A face-to-face evaluation within the last 60 days.• The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1).	
Plain x-rays of the sacrum/coccyx are negative for fracture	
Advanced Diagnostic Imaging:	MRI pelvis without contrast (CPT [®] 72195)
Comments:	A CT pelvis without contrast (CPT [®] 72192) when MRI is contraindicated.

✓ **Red Flag Indications:** See **SP-1.2 Red Flag Indications**

Practice Notes:

Coccydynia is often reported by patients as “tailbone” pain that is usually idiopathic or post-traumatic and generally follows a benign course.

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SPINE IMAGING GUIDELINES

SP-6~LOWER EXTREMITY PAIN WITH NEUROLOGICAL FEATURES (RADICULOPATHY, RADICULITIS, OR PLEXOPATHY AND NEUROPATHY) WITH OR WITHOUT LOW BACK (LUMBAR SPINE) PAIN

SP 6.1: Lower Extremity Pain with Neurological Features (Radiculopathy, Radiculitis, or Plexopathy and Neuropathy) with or without Low Back (Lumbar Spine) Pain

<i>All of the following are required prior to advanced imaging:</i>	
<ul style="list-style-type: none"> Initial clinical evaluation performed. A face-to-face evaluation within the last 60 days. The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see (SP 1.1)).	
For spinal stenosis, see (SP 9.1)	
Advanced Diagnostic Imaging:	MRI Lumbar Spine without contrast (CPT [®] 72148)
Comments:	A CT lumbar spine without contrast (CPT [®] 72131) or CT Myelography (CPT [®] 72132) is appropriate when MRI is contraindicated.

SP 6.2: Low Back (Lumbar Spine) Trauma

<i>All of the following are required prior to advanced imaging:</i>	
<ul style="list-style-type: none"> Initial clinical evaluation performed. A face-to-face evaluation within the last 60 days. The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of physician-directed treatment and/or observation.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP 1.1).	
Plain x-rays of lumbar spine negative for fracture.	
Advanced Diagnostic Imaging:	MRI Lumbar Spine without contrast (CPT [®] 72148) or CT Lumbar Spine without contrast (CPT [®] 72131).

- ✓ **Red Flag Indications:** See **SP-1.2 Red Flag Indications**
- ✓ Definitions of radiculopathy, radiculitis and radicular pain: See **SP-1.3**
- ✓ Sciatic Neuropathy, Femoral Neuropathy, Peroneal Neuropathy and Meralgia Paresthetica: See **PN-2 Focal Neuropathy**
- ✓ Lumbar and/or Lumbosacral Plexopathy: See **PN-5 Lumbar and Lumbosacral Plexus**
- ✓ Meralgia Paresthetica: See **PN-2 Focal Neuropathy**
- ✓ Advanced imaging of the hip or pelvis is not generally required in the evaluation of apparent lumbar radiculopathy unless a separate recognized indication for such studies is documented. See **MS-24 Hip Pain** in the Musculoskeletal Imaging Guidelines.

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SP-7~Myelopathy

SP-7.1 Myelopathy

Myelopathy is the development of abnormal spinal cord function with long tract signs usually secondary to spinal cord compression, but also inflammation (transverse myelitis, MS, etc.), neoplastic disease or spinal cord infarction.

Examination findings may include loss of manual dexterity, spastic legs and ataxia with hyperreflexia and upgoing toes (positive Babinski), Hoffman's sign, sustained clonus, Lhermitte's sign, crossed radial reflex, inverted radial reflex and finger escape sign. Sensory level and urinary incontinence/retention may be seen. Advanced imaging is generally appropriate in the initial evaluation of documented or reasonably suspected myelopathy.

- ✓ Cervical and thoracic spine MRI without contrast, or without and with contrast, is appropriate for:
 - Initial evaluation of reasonably suspected myelopathy.
 - Suspected tethered cord.
 - Post-traumatic syrinx with increased spinal pain or a worsening neurological symptoms.
 - Sustained, prominent, and unexplained **Lhermitte's Sign** (reproducible electric sensation that shoots down the entire spine and sometimes into the limbs with sudden neck flexion).
 - Unexplained Babinski's sign (extension of the great toe with splaying of the other toes) after advanced imaging of the brain.
 - Hoffman's sign after advanced imaging of the brain has been performed.
- ✓ CT/Myelography scan can also be considered, especially for surgical planning.

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**SP-8~LUMBAR SPINE
SPONDYLOLYSIS/SPONDYLOLISTHESIS**

SP-8.1 Spondylolysis

- ✓ Lumbar spine CT without contrast (CPT[®] 72131) or lumbar spine MRI without contrast (CPT[®] 72148) is appropriate if one of the following:
 - Plain x-rays are negative, equivocal or indeterminate and clinical suspicion is high; *or*
 - Failure of 6 weeks immobilization with a spinal orthosis and physician-directed treatment with clinical re-evaluation; *or*
 - Pre-operative evaluation; *or*
 - Red Flag Indications (See **SP-1.2 Red Flag Indications**)
- ✓ For pediatric spondylolysis, see **PEDSP 2.4: Spondylolysis**
- ✓ Bony healing cannot be achieved non-surgically in an established well defined isthmic pars interarticularis defect whether it is developmental or the result of a pars interarticularis fracture non-union. Repeat advanced diagnostic imaging is not beneficial in this setting.

SP-8.2 Spondylolisthesis

CT lumbar spine without contrast (CPT[®] 72131) or MRI lumbar spine without contrast (CPT[®] 72148) can be considered after plain x-ray for the following:

- Failure of 6 week trial of physician-directed treatment and clinical re-evaluation (See **SP-1.1**); *or*
- Preoperative evaluation; *or*
- Red Flag Indications (See **SP-1.2 Red Flag Indications**)

Practice Notes

Stress reactions and stress fractures of the pars interarticularis are most common in athletes and others whose activities involve repetitive flexion/extension loading of the lumbar spine and may be acute or chronic and unilateral or bilateral. Pars interarticularis defects can be an incidental finding on plain x-rays and is frequently asymptomatic.

Spondylolisthesis is the forward (anterolisthesis) or backward (retrolisthesis, usually not clinically significant) displacement of one vertebra in relation to an adjacent vertebra, most commonly at L4-5 and L5-S1, although other levels of the spine may be involved. Spondylolisthesis is often an incidental finding on plain x-ray and is frequently asymptomatic.

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SP-9~LUMBAR SPINAL STENOSIS

SP-9.1 Lumbar Spinal Stenosis

- ✓ MRI lumbar spine without contrast (CPT[®] 72148) or CT Lumbar Spine without contrast (CPT[®] 72131) is appropriate for those patients with clinical suspicion of lumbar spinal stenosis if:
 - Failure of 6 week trial of physician-directed treatment and clinical re-evaluation (See **SP-1.1**); *or*
 - Red Flag Indications (See: **SP-1.2 Red Flag Indications**); *or*
 - Severe symptoms of neurogenic claudication restricting normal activity or requiring the frequent use of narcotic analgesics.
- ✓ A CT/Myelogram lumbar spine (CPT[®] 72132) may also be considered for patients who have failed 6-weeks of physician-directed treatment if requested by the operating surgeon for surgical planning, especially for multi-level lumbar spinal stenosis.

Practice Notes

Lumbar spinal stenosis refers to a decrease in the space available for the neural elements within the spinal canal that include spinal nerve roots and the cauda equina. It is usually a degenerative condition of the aging spine which can be asymptomatic or a common cause of buttock/low back and/or leg pain (neurogenic claudication) in this population. Neurogenic claudication is a common symptom of lumbar spinal stenosis that is aggravated by walking, especially down hills or stairs, with prolonged standing and is often relieved by sitting and bending forward. Neurogenic claudication should be differentiated from vascular claudication (leg/calf pain) that is often aggravated by walking and relieved fairly rapidly by stopping and rest. The differential diagnosis for lumbar spinal stenosis should include peripheral vascular disease, hip disorders and peripheral neuropathy.

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**SP-10~SACRO-ILIAC (SI) JOINT PAIN,
INFLAMMATORY SPONDYLITIS/SACROILIITIS and
FIBROMYALGIA**

SP-10.1 Sacro-Iliac (SI) Joint Pain/Sacroiliitis

- ✓ Pelvis CT without contrast (CPT[®] 72192) or MRI pelvis without contrast (CPT[®] 72195) is appropriate if:
 - Initial plain x-rays are equivocal or not diagnostic; *and*
 - Failure of 6 weeks of physician-directed treatment and clinical re-evaluation (See: **SP-1.1**); *or*
 - Any one of the following:
 - Fractures of the sacrum or sacroiliac joint(s); *or*
 - Suspicion of neoplastic, inflammatory or infectious disease
 - (See: **SP-1.2 Red Flag Indications**); *or*
 - Pre-operative planning
 - MRI pelvis without and with contrast as indicated for pediatric patients with juvenile idiopathic arthritis.
- ✓ See also: **MS-15.1 Rheumatoid Arthritis and Inflammatory Arthritis**

SP-10.2 Inflammatory Spondylitis

- ✓ Initial plain x-rays are equivocal or not diagnostic.
 - MRI without contrast of the affected spinal region.
 - MRI Cervical Spine without contrast (CPT[®] 72141) if a patient with documented ankylosing spondylitis reports neck pain following any head/maxillofacial/neck injury.

SP-10.3 Fibromyalgia

- ✓ Advanced diagnostic imaging is not supported by the scientific evidence for the evaluation and treatment of fibromyalgia.

Practice Notes

Sacroiliitis can present with pain localized to the SI joint or referred pain to the buttock and/or posterior thigh without neurologic signs or symptoms. Affected individuals can often point to the SI joint as the pain source. Provocative and/or therapeutic SI joint anesthetic/corticosteroid injections can have diagnostic value.

There is no evidence demonstrating that advanced diagnostic imaging substantiates changes to patient management decisions in patients with proven SI joint disorders when visible on routine plain x-rays.

There is no evidence demonstrating that advanced diagnostic imaging substantiates changes to patient management decisions in patients with proven SI joint disorders when visible on routine plain x-rays.

MRI has shown inflammatory changes in the SI joints prior to visible x-ray changes in several studies. However, the ability of MRI to characterize inflammation in early ankylosing spondylitis, the ability of MRI to predict erosive changes, and the value of monitoring treatment effects using serial MRI studies remains controversial and investigational in adults.

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SP-11~PATHOLOGICAL SPINAL COMPRESSION FRACTURES

SP-11.1 Pathological Spinal Compression Fractures

- ✓ MRI without contrast or CT without contrast of the affected spinal region can be considered after plain x-ray evaluation *and* the location of the patient's spinal pain is concordant with the spinal x-rays for any one of the following:
 - X-rays reveal a new spinal compression fracture; *or*
 - X-rays are non-diagnostic and severe spinal pain persists for more than one week in a patient already predisposed to low energy/insufficiency fractures; *or*
 - The acuity of the spinal compression fracture deformity on plain x-ray is indeterminate, *or*
 - Surgical planning following known insufficiency spinal compression fractures in individuals who are candidates for kyphoplasty, vertebroplasty or other spine surgical procedures; *or*
 - Red Flag Indications (See: **SP-1.2 Red Flag Indications**)

Practice Notes

Insufficiency/low energy spinal compression fractures of the spine occur due to the lack of structural integrity to withstand physiologic loads and minor spinal trauma. Low bone mineral density is the primary etiology for most of these fractures but could also occur in the setting of other bone disease and medical conditions, in addition to neoplastic disease and infection. Sudden localized back pain, with or without trauma, is a typical presentation of insufficiency/low energy spinal compression fractures and can often be an incidental finding on plain x-rays and can be asymptomatic.

References

1. Patel ND, Broderick DF Burns J, et al. ACR Appropriateness Criteria Low Back Pain, Journal of the American College of Radiology, Volume 13, Number 9, September 2016 Old JL, Calvert M. Vertebral compression fractures in the elderly. *Am Fam Physician* 2004; 69:111-116.
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SP-12~SPINAL PAIN in CANCER PATIENTS

- ✓ For guidelines regarding advanced diagnostic imaging in this clinical setting, see **ONC-31.6 Spinal Cord Compression**.
- ✓ For metastatic disease of the spine without neurological signs or symptoms:
 - See: **ONC-31.5 Bone (and Spine)** for advanced diagnostic imaging guidelines in patients with spinal pain with a history of primary or metastatic neoplastic disease, especially cancer of the breast, lung, thyroid, kidney and prostate.

SP-13~SPINAL CANAL/CORD DISORDERS (e.g. SYRINGOMYELIA)

SP-13.1 Initial Imaging Pathway

- ✓ MRI cervical spine without and with contrast (CPT[®] 72156) is appropriate when syringomyelia is suspected.
- ✓ Once a syrinx is identified by the initial MRI cervical spine without and with contrast **and**:
 - MRI of the brain, usually without contrast (CPT[®] 70551) to evaluate for syringobulbia; **and**
 - MRI of the thoracic spine without and with contrast (CPT[®] 72157) to define the lower most extent of the syrinx or to identify a skip lesion.
 - Advanced diagnostic imaging of the lumbar spine is generally not indicated unless tethered cord is suspected.

SP-13.2 Follow-up imaging:

- ✓ MRI cervical spine without contrast (CPT[®] 72141) and MRI brain without contrast (CPT[®] 70551) and/or MRI thoracic spine without contrast (CPT[®] 72146) when involved.
 - If there is a concern for malignancy, imaging can be performed with and without contrast.
 - Annual imaging until non-progression of the syringomyelia is established.
 - Following surgical treatment (including posterior fossa decompression).
 - Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established.
 - Repeat advanced diagnostic imaging is appropriate when evidence of neurologic deterioration.
 - Repeat advanced diagnostic imaging in spinal cord injury patients with post-traumatic syrinx is not appropriate without evidence of neurological deterioration.

Practice Notes

Syringomyelia may begin to form in childhood but rarely becomes symptomatic before the adult years.

Reference

1. Mancall ER, *Syringomyelia*. In Rowland LP (ED.). *Merritt's Neurology*. 11th Ed. Philadelphia, Lippincott, 2005, pp: 870-874.

SP-14~SPINAL DEFORMITIES (e.g. SCOLIOSIS/KYPHOSIS)

SP-14.1 Spinal Deformities (e.g. Scoliosis/Kyphosis)

- ✓ MRI without contrast or MRI without and with contrast of the affected spinal regions is appropriate after plain x-rays (e.g. Cobb radiographs) of the affected spinal regions:
 - For preoperative evaluation; *or*
 - For cases of congenital scoliosis and other atypical curves that may be associated with spinal canal/cord pathology such as tethered cord, syringomyelia, diastematomyelia, or tumors; *or*
 - For cases of scoliosis when there are associated neurologic signs and symptoms on physical examination; *or*
 - Scoliosis with a convex left thoracic curve due to a high association of a convex left thoracic curve with underlying spinal canal/cord pathology.

SP 14.2 Revision Spinal Deformity Surgery

- ✓ CTA or MRA is not medically necessary for preoperative planning for initial anterior spinal surgery for surgical correction of spinal deformities.
- ✓ If requested by the operating surgeon, the following studies can be performed for pre-operative planning for revision anterior spinal surgery:
 - CTA pelvis (CPT[®] 72191) and/or CTA abdomen (CPT[®] 74175); or
 - MRA pelvis (CPT[®] 72198) and/or MRA abdomen (CPT[®] 74185)

Practice Notes

Scoliosis is defined as a curvature of the spine in the coronal plane. Scoliosis can involve any or all levels of the spine but generally involves the thoracic and/or lumbar spine. Scoliosis initially occurs in the pediatric and adolescent population and persists throughout life. If scoliosis begins in adulthood, it is usually secondary to neurologic disorders (e.g., posttraumatic paralysis) or degenerative spondylosis. Sagittal plane spinal deformity (e.g. kyphosis, hyperlordosis) may be associated with scoliosis.

References

1. Boas SR. *Kyphoscoliosis: Adolescent Idiopathic Scoliosis and Congenital Scoliosis* (Chapter 416.5). In Kliegman RM, Behrman RE, Jenson HB, et al. (Eds.). *Nelson Textbook of Pediatrics*. 18th Ed. Philadelphia, Elsevier, 2007, pp.1843-1844.
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3. Do T, Fras C, Burke S, et al. Clinical value of routine preoperative magnetic resonance imaging in adolescent idiopathic scoliosis. *J Bone Joint Surg Am* 2001; 83: 577-579.

4. Dobbs MB, Lenke LG, Szymanski DA, et al. Prevalence of neural axis abnormalities in patients with infantile idiopathic scoliosis. *J Bone Joint Surg Am* 2002; 84: 2230-2234.
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11. Gstottner M, Godny B, Petersen J., et al. CT angiography for anterior lumbar spine access: high radiation exposure and low clinical relevance. *Clin Orthop Relat Res*, 2011; 469(3): 819-824.

SP-15~POST-OPERATIVE SPINAL DISORDERS

Following plain x-rays of the affected spinal regions post-surgical, see **SP-2.1 Anatomic Guidelines**.

SP-15.1 Greater than Six Months Post-Operative

- ✓ MRI without and with contrast of the affected spinal region(s) is appropriate when:
 - Patient is more than six months post-operative; **and**
 - No significant improvement after a recent (within 3 months) six week trial of physician- directed treatment and/or observation with clinical re-evaluation; **or**
 - Red Flag Indications (See: **SP-1.2 Red Flag Indications**)

SP-15.2 Routine Post-Fusion Imaging

- ✓ Requests will be forwarded to Medical Director Review. Following a clinically successful spinal fusion, advanced diagnostic imaging is generally not indicated.
- ✓ **PET** is not currently indicated for the routine assessment of spinal fusions or unsuccessful spine surgery (See: **SP-2.8**). Requests for PET will be forwarded to Medical Director Review.

SP-15.3 Prolonged Intractable Pain Following Spinal Surgery

Open discectomy and laminectomy:

- MRI without and with contrast of the affected spinal region(s) if there are residual, new or recurrent symptoms related to the surgical site.
 - CT/Myelography of the affected spinal region(s) if MRI is contraindicated.

Spinal fusions with or without Open Discectomy and/or Laminectomy:

- These can be challenging problems that may require more than one advanced imaging study. Requests will be forwarded to Medical Director Review.

SP-15.4 Revision Fusion Surgery

If requested by the operating surgeon, the following studies can be performed for pre-operative planning prior to surgical revision of a lumbar anterior spinal arthrodesis.

- CTA pelvis (CPT[®] 72191) and/or CTA abdomen (CPT[®] 74175); *or*
- MRA pelvis (CPT[®] 72198) and/or MRA abdomen (CPT[®] 74185)

References

1. Hayashi D, Roemer FW, Mian A, Gharaibeh M, et al. Imaging features of post-operative complications after spinal surgery and instrumentation. *AJR*. 2012;199:W123-W129.
2. Thakkar RS, Malloy JP, Thakkar S, Carrino JA, Khanna AJ. Imaging the post-operative spine. *Rad Clin North Am*.2012;50:731-747.
3. Kathuria S. Post-vertebral augmentation spine imaging. *Neuroimaging Clin N Am*. 2014;24(2):337-347.
4. Savage JW, Schroeder GD, Anderson PA. Vertebroplasty and kyphoplasty for the treatment of osteoporotic vertebral compression fractures. *J Am Acad Orthop Surg*. 2014;22:653-664.
5. Gstottner M, Godny B, Petersen J., et al. CT angiography for anterior lumbar spine access: high radiation exposure and low clinical relevance. *Clin Orthop Relat Res*, 2011; 469(3): 819-824.

**SP-16~OTHER IMAGING STUDIES and PROCEDURES
RELATED to the SPINE IMAGING GUIDELINES**

Positional, Kinetic, Dynamic or Weight-bearing MRI, see: **SP-2.2 MRI of the Spine**.

For PET see: **SP-2.8 Spine PET**

For CT/Myelography see: **SP-2.3 CT of the Spine**

SP-16.1 MRA and CTA

- ✓ MRA and CTA are generally not indicated for pre-operative planning of initial anterior spinal surgery unless abnormal vasculature is known or reasonably anticipated. Requests will be forwarded to Medical Director Review.

SP-16.2 Interventional Spinal Injections

- ✓ Advanced diagnostic imaging studies of the spine are not required prior to facet joint injections, medial branch blocks or radiofrequency ablations unless the criteria for advanced imaging studies of the spine are met as otherwise stated in the Spine Imaging Guidelines.
- ✓ Advanced diagnostic imaging studies of the cervical spine and/or thoracic spine are indicated within 12 months prior to interlaminar or transforaminal epidural steroid injections of the cervical or thoracic spine.
- ✓ Advanced diagnostic imaging studies of the lumbar spine are indicated prior to transforaminal epidural steroid injections of the lumbar spine and are not required for lumbar spine interlaminar or caudal epidural steroid injections.

SP-16.3 Advanced Imaging for Spinal Cord Stimulators (SCS)

- ✓ MRI thoracic spine without contrast (CPT[®] 72146) is generally the study of choice. CT thoracic spine without contrast (CPT[®] 72128) or CT/Myelography thoracic spine (CPT[®] 72129) are acceptable alternatives.
- ✓ Imaging of the lumbar spine is not indicated for insertion of spinal cord stimulators.
- ✓ Requests for advanced diagnostic imaging of the cervical spine prior to SCS placement will be forwarded to Medical Director Review.

SP-16.4 Following Vertebral Augmentation Procedures

- ✓ CT without contrast of the affected spinal region(s) within 24 hours post-procedure to evaluate neurologic sequelae resulting from cement extravasation.

Practice Note

MRI has not been shown to change the outcome of interventional pain procedures in recent scientific evidence-based studies and without substantial change in the clinical picture or intervening surgery. Repeat advanced diagnostic imaging studies are not necessary with each spinal injection or series of spinal injections.

Reference

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8. Gilbert TJ, Spitz D, Johnson B, Schellhas K. CDI Quality Institute Epidural Steroid Guideline, 2015 https://www.mycdi.com/about_us/cdi_quality_institute/clinical_guidelines

SP-17~NUCLEAR MEDICINE

- ✓ Nuclear Medicine
 - Nuclear medicine studies are rarely used in the evaluation the spine, but are indicated in the following circumstances:
 - Bone scan (CPT[®] 78315 or CPT[®] 78320) is indicated for evaluation of suspected loosening of orthopedic prostheses when recent plain x-ray is nondiagnostic.
- ✓ Any of the following studies are indicated for initial evaluation of suspected osteomyelitis:
 - Bone scan (one of CPT[®] codes: 78300, 78305, 78306, or 78315)
 - Nuclear Bone Marrow imaging (one of CPT[®] codes: 78102, 78103, or 78104)
 - Radiopharmaceutical inflammatory imaging (one of CPT[®] codes: 78805, 78806, or 78807)
- ✓ For follow-up imaging, any of the following studies are indicated for evaluation of response to treatment in established osteomyelitis:
 - Bone scan (one of CPT[®] codes: 78300, 78305, 78306, or 78315)
 - Nuclear Bone Marrow imaging (one of CPT[®] codes: 78102, 78103, or 78104)
 - Radiopharmaceutical inflammatory imaging (one of CPT[®] codes: 78805, 78806, or 78807)
- ✓ SPECT bone scan (CPT[®] 78320) is indicated for evaluation of facet arthropathy in patients with ankylosing spondylitis, osteoarthritis, or rheumatoid arthritis.