



## Medical Policy

# Dynamic Spinal Visualization and Vertebral Motion Analysis

### Table of Contents

- [Policy: Commercial](#)
- [Policy: Medicare](#)
- [Authorization Information](#)
- [Coding Information](#)
- [Description](#)
- [Policy History](#)
- [Information Pertaining to All Policies](#)
- [References](#)

### Policy Number: 195

BCBSA Reference Number: 6.01.46 (For Plan internal use only)  
 NC/LCD: NA

### Related Policies

None

### Policy

## Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO Blue<sup>SM</sup> and Medicare PPO Blue<sup>SM</sup> Members

The use of dynamic spinal visualization is considered [INVESTIGATIONAL](#).

Vertebral motion analysis is considered [INVESTIGATIONAL](#).

### Prior Authorization Information

#### Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

#### Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	This is <b>not</b> a covered service.
Commercial PPO and Indemnity	This is <b>not</b> a covered service.
Medicare HMO Blue <sup>SM</sup>	This is <b>not</b> a covered service.
Medicare PPO Blue <sup>SM</sup>	This is <b>not</b> a covered service.

### CPT Codes / HCPCS Codes / ICD Codes

*Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.*

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

**The following CPT codes are considered investigational for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:**

## CPT Codes

CPT codes:	Code Description
76120	Cineradiography/videoradiography, except where specifically included
76125	Cineradiography/videoradiography to complement routine examination

## DESCRIPTION

### Flexion/Extension Radiography

Dynamic spinal visualization and vertebral motion analysis are proposed for individuals who are being evaluated for back or neck pain and are being considered for standard flexion/extension radiographs. Flexion/extension radiographs may be performed with a passive external force or by the patient's own movement. Typically, radiographs are taken at the end ranges of flexion and extension and the intervertebral movements (rotation and translation) are measured to assess spinal instability. Flexion/extension radiographs may be used to assess radiographic instability in order to diagnose and determine the most effective treatment (eg, physical therapy, decompression, or spinal fusion) or to assess the efficacy of spinal fusion.

### Dynamic Spinal Visualization

#### Digital Motion X-Ray

Most spinal visualization technologies use x-rays to create images either on film, video monitor, or computer screen. Digital motion x-ray involves the use of film x-ray or computer-based x-ray "snapshots" taken in sequence as a patient moves. Film x-rays are digitized into a computer for manipulation, while computer-based x-rays are automatically created in a digital format. Using a computer program, the digitized snapshots are then sequenced and played on a video monitor, creating a moving image of the inside of the body. This moving image can then be evaluated by a physician alone or by using computer software that evaluates several aspects of the body's structure, such as intervertebral flexion and extension, to determine the presence or absence of abnormalities.

#### Videofluoroscopy and Cineradiography

Videofluoroscopy and cineradiography are different names for the same procedure, which uses fluoroscopy to create real-time video images of internal structures of the body. Unlike standard x-rays, which take a single picture at 1 point in time, fluoroscopy provides motion pictures of the body. The results of these techniques can be displayed on a video monitor as the procedure is being conducted, as well as recorded, to allow computer analysis or evaluation at a later time. Like digital motion x-ray, the results can be evaluated by a physician alone or with the assistance of computer software.

#### Dynamic Magnetic Resonance Imaging

Dynamic magnetic resonance imaging (MRI) is also being developed to image the cervical spine. This technique uses an MRI-compatible stepless motorized positioning device and a real-time true fast imaging with steady-state precession sequence to provide passive kinematic imaging of the cervical spine. The quality of the images is lower than a typical MRI sequence but is proposed to be adequate to observe changes in the alignment of vertebral bodies, the width of the spinal canal, and the spinal cord. Higher-resolution imaging can be performed at the end positions of flexion and extension.

#### Vertebral Motion Analysis

Vertebral motion analysis systems like the KineGraph VMA (Vertebral Motion Analyzer) provide assisted bending with fluoroscopic imaging and computerized analysis. The device uses facial recognition

software to track vertebral bodies across the images. Proposed benefits of the vertebral motion analysis are a reduction in patient-driven variability in bending and assessment of vertebral movement across the entire series of imaging rather than at the end range of flexion and extension.

## Summary

### Description

Dynamic spinal visualization is a general term addressing different imaging technologies that simultaneously visualize spine (vertebrae) movements and external body movement. Vertebral motion analysis uses similar imaging as dynamic spinal visualization, with the addition of controlled movement and computerized tracking. These technologies have been proposed for the evaluation of spinal disorders including neck and back pain.

### Summary of Evidence

For individuals who have neck or back pain who receive dynamic spinal visualization, the evidence includes comparative trials. Relevant outcomes are test accuracy, symptoms, and functional outcomes. Techniques include digital motion x-rays, cineradiography/videofluoroscopy, or dynamic magnetic resonance imaging (MRI) of the spine and neck. Most available studies compare spine kinetics in patients who had neck or back pain with spine kinetics in healthy controls. In a feasibility study of 21 patients examining dynamic MRI for the detection of spondylolithesis, 3 dynamic MRI protocols demonstrated sensitivities of 68.8% to 78.6% when compared to standard flexion-extension radiographs. No evidence was identified on the effect of this technology on symptoms or functional outcomes. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have back or neck pain who receive vertebral motion analysis, the evidence includes comparisons to standard flexion/extension radiographs. Relevant outcomes are test accuracy, symptoms, and functional outcomes. These studies reported that vertebral motion analysis reduces variability in measurement of rotational and translational spine movement compared with standard flexion/extension radiographs. Whether the reduction in variability improves diagnostic accuracy or health outcomes is uncertain. The single study that reported on diagnostic accuracy lacked a true criterion standard, limiting interpretation of findings. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

## Policy History

Date	Action
11/2023	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
10/2022	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
10/2021	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
11/2020	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
10/2019	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
2/2019	Annual policy review. New investigational indications described. Vertebral Motion Analysis added to title. Effective 2/1/2019.
11/2015	Added coding language.
12/2013	Annual policy review. New references added.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
6/2011	Reviewed - Medical Policy Group – Orthopedics, Rehabilitation and Rheumatology. No changes to policy statements.
1/2011	Reviewed - Medical Policy Group – Neurology and Neurosurgery. No changes to policy statements.

7/2010	Reviewed - Medical Policy Group – Orthopedics, Rehabilitation and Rheumatology. No changes to policy statements.
6/1/2010	Medical Policy 195 issued describing on going non-coverage. Effective 6/1/2010.

## Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

## References

1. Xu N, Wang S, Yuan H, et al. Does Dynamic Supine Magnetic Resonance Imaging Improve the Diagnostic Accuracy of Cervical Spondylotic Myelopathy? A Review of the Current Evidence. *World Neurosurg.* Apr 2017; 100: 474-479. PMID 28130164
2. Teyhen DS, Flynn TW, Childs JD, et al. Arthrokinematics in a subgroup of patients likely to benefit from a lumbar stabilization exercise program. *Phys Ther.* Mar 2007; 87(3): 313-25. PMID 17311885
3. Ahmadi A, Maroufi N, Behtash H, et al. Kinematic analysis of dynamic lumbar motion in patients with lumbar segmental instability using digital videofluoroscopy. *Eur Spine J.* Nov 2009; 18(11): 1677-85. PMID 19727854
4. Walter WR, Alizai H, Bruno M, et al. Real-time dynamic 3-T MRI assessment of spine kinematics: a feasibility study utilizing three different fast pulse sequences. *Acta Radiol.* Jan 2021; 62(1): 58-66. PMID 32233646
5. Hino H, Abumi K, Kanayama M, et al. Dynamic motion analysis of normal and unstable cervical spines using cineradiography. An in vivo study. *Spine (Phila Pa 1976).* Jan 15 1999; 24(2): 163-8. PMID 9926388
6. Takayanagi K, Takahashi K, Yamagata M, et al. Using cineradiography for continuous dynamic-motion analysis of the lumbar spine. *Spine (Phila Pa 1976).* Sep 01 2001; 26(17): 1858-65. PMID 11568694
7. Wong KW, Leong JC, Chan MK, et al. The flexion-extension profile of lumbar spine in 100 healthy volunteers. *Spine (Phila Pa 1976).* Aug 01 2004; 29(15): 1636-41. PMID 15284509
8. Cheng B, Castellvi AE, Davis RJ, et al. Variability in Flexion Extension Radiographs of the Lumbar Spine: A Comparison of Uncontrolled and Controlled Bending. *Int J Spine Surg.* 2016; 10: 20. PMID 27441178
9. Yeager MS, Cook DJ, Cheng BC. Reliability of computer-assisted lumbar intervertebral measurements using a novel vertebral motion analysis system. *Spine J.* Feb 01 2014; 14(2): 274-81. PMID 24239805
10. Davis RJ, Lee DC, Wade C, et al. Measurement Performance of a Computer Assisted Vertebral Motion Analysis System. *Int J Spine Surg.* 2015; 9: 36. PMID 26273554