

**EFFECTIVE DATE:** 06|01|2017  
**POLICY LAST UPDATED:** 10|02|2018

## OVERVIEW

Dynamic spinal visualization is a general term addressing different imaging technologies that simultaneously visualize spinal (vertebral) 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.

## MEDICAL CRITERIA

Not applicable

## PRIOR AUTHORIZATION

Not applicable

## POLICY STATEMENT

### BlueCHiP for Medicare

The use of dynamic spinal visualization and vertebral motion analysis is not covered as the evidence is insufficient to determine the effects of the technology on health outcomes.

### Commercial Products

The use of dynamic spinal visualization and vertebral motion analysis is considered not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

## COVERAGE

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for applicable not medically necessary/not covered benefits/coverage.

## BACKGROUND

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 either 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 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 (MRI) is also being developed to image the cervical spine. This technique uses an MRI-compatible step less 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 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.

### **Regulatory Status**

In 2012, the KineGraph VMA™ (Vertebral Motion Analyzer; Ortho Kinematics) was cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process. The system includes a Motion Normalizer™ for patient positioning, standard fluoroscopic imaging, and automated image recognition software. Processing of scans by Ortho Kinematics is charged separately.

For individuals who have back or neck pain and 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 of the spine and neck. The available studies compare spine kinetics in patients with neck or back pain to that in healthy controls. No literature was identified on the diagnostic accuracy of dynamic visualization in a relevant patient population. No evidence was identified on the effect of this technology on symptoms or functional outcomes. The evidence is insufficient to determine the effects of the technology on health outcomes.

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 the effects of the technology on health outcomes.

### **CODING**

The following CPT codes are not covered for BlueCHiP for Medicare and not medically necessary for Commercial products:

**76120** Cineradiography/videoradiography, except where specifically included

**76125** Cineradiography/videoradiography to complement routine examination (list separately in addition to code for primary procedure)

There is no specific code for vertebral motion analysis and some dynamic spinal visualization techniques. Therefore, unlisted CPT codes 76496 or 76499 may be used.

### **RELATED POLICIES**

None

### **PUBLISHED**

Provider Update, Nov. /Dec. 2018

Provider Update, June 2017

## 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):313-325. 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):1677-1685. PMID 19727854
4. 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):163-168. PMID 9926388
5. Takayanagi K, Takahashi K, Yamagata M, et al. Using cineradiography for continuous dynamic-motion analysis of the lumbar spine. *Spine (Phila Pa 1976).* Sep 1 2001;26(17):1858-1865. PMID 11568694
6. Wong KW, Leong JC, Chan MK, et al. The flexion-extension profile of lumbar spine in 100 healthy volunteers. *Spine (Phila Pa 1976).* Aug 1 2004;29(15):1636-1641. PMID 15284509
7. 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.* Jul 2016;10:20. PMID 27441178
8. Yeager MS, Cook DJ, Cheng BC. Reliability of computer-assisted lumbar intervertebral measurements using a novel vertebral motion analysis system. *Spine J.* Feb 1 2014;14(2):274-281. PMID 24239805
9. Davis RJ, Lee DC, Wade C, et al. Measurement performance of a computer assisted vertebral motion analysis system. *Int J Spine Surg.* Aug 2015;9:36. PMID 26273554

[CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS](#)

This medical policy is made available to you for informational purposes only. It is not a guarantee of payment or a substitute for your medical judgment in the treatment of your patients. Benefits and eligibility are determined by the member's subscriber agreement or member certificate and/or the employer agreement, and those documents will supersede the provisions of this medical policy. For information on member-specific benefits, call the provider call center. If you provide services to a member which are determined to not be medically necessary (or in some cases medically necessary services which are non-covered benefits), you may not charge the member for the services unless you have informed the member and they have agreed in writing in advance to continue with the treatment at their own expense. Please refer to your participation agreement(s) for the applicable provisions. This policy is current at the time of publication; however, medical practices, technology, and knowledge are constantly changing. BCBSRI reserves the right to review and revise this policy for any reason and at any time, with or without notice. Blue Cross & Blue Shield of Rhode Island is an independent licensee of the Blue Cross and Blue Shield Association.

