Protocol

Dynamic Spinal Visualization

(60146)

Medical Benefit		**Effective Date**: 01/01/09	**Next Review Date**: 03/18
Preauthorization	No	**Review Dates**: 09/07, 09/08, 09/09, 05/10, 03/11, 03/12, 03/13, 03/14, 03/15, 03/16, 03/17	

Preauthorization is not required.

The following protocol contains medical necessity criteria that apply for this service. The criteria are also applicable to services provided in the local Medicare Advantage operating area for those members, unless separate Medicare Advantage criteria are indicated. If the criteria are not met, reimbursement will be denied and the patient cannot be billed. Please note that payment for covered services is subject to eligibility and the limitations noted in the patient's contract at the time the services are rendered.

Populations	Interventions	Comparators	Outcomes
Individuals: • With spinal neck or back pain	Interventions of interest are: • Dynamic spinal visualization	Comparators of interest are: • Conventional spinal imaging	Relevant outcomes include: • Test accuracy • Symptoms • Morbid events • Functional outcomes

Description

Dynamic spinal visualization is a general term addressing different imaging technologies that allow the simultaneous visualization of movement of internal body structures such as the spine (vertebrae) with external body movement. These technologies have been proposed for the evaluation of spinal disorders including neck and back pain.

Summary of Evidence

The evidence on dynamic spinal visualization in patients with back or neck pain includes comparisons of spine kinetics in patients with neck or back pain with healthy controls. Relevant outcomes are test accuracy, symptoms, morbid events, and functional outcomes. Techniques include digital motion x-rays, cineradiography/videofluoroscopy, or dynamic magnetic resonance imaging of the spine. No literature was identified on the diagnostic accuracy of this technology in a relevant population of patients. 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.

Policy

The use of dynamic spinal visualization is considered **investigational**.

Background

Most spinal visualization methods 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 put in order 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 a computer 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 one 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 analysis software.

Dynamic magnetic resonance imaging (MRI) is also being developed for imaging of the cervical spine. This technique uses an MRI-compatible stepless motorized positioning device (NeuroSwing, Fresenius/Siemens) 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.

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. FDA product code: LLZ.

Services that are the subject of a clinical trial do not meet our Technology Assessment Protocol criteria and are considered investigational. *For explanation of experimental and investigational, please refer to the Technology Assessment Protocol.*

It is expected that only appropriate and medically necessary services will be rendered. We reserve the right to conduct prepayment and postpayment reviews to assess the medical appropriateness of the above-referenced procedures. **Some of this protocol may not pertain to the patients you provide care to, as it may relate to products that are not available in your geographic area.**

References

We are not responsible for the continuing viability of web site addresses that may be listed in any references below.

1. 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

2. 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
3. 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
4. Fujiwara A, Tamai K, An HS, et al. The relationship between disc degeneration, facet joint osteoarthritis, and stability of the degenerative lumbar spine. J Spinal Disord. Oct 2000; 13(5):444-450. PMID 11052356
5. Okawa A, Shinomiya K, Komori H, et al. Dynamic motion study of the whole lumbar spine by videofluoroscopy. Spine (Phila Pa 1976). Aug 15 1998; 23(16):1743-1749. PMID 9728375
6. 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
7. 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
8. Breen AC, Muggleton JM, Mellor FE. An objective spinal motion imaging assessment (OSMIA): reliability, accuracy and exposure data. BMC Musculoskelet Disord. 2006; 7:1. PMID 16393336
9. Mellor FE, Muggleton JM, Bagust J, et al. Midlumbar lateral flexion stability measured in healthy volunteers by in vivo fluoroscopy. Spine (Phila Pa 1976). Oct 15 2009; 34(22):E811-817. PMID 19829245
10. Gerigk L, Bostel T, Hegewald A, et al. Dynamic magnetic resonance imaging of the cervical spine with high-resolution 3-dimensional T2-imaging. Clin Neuroradiol. Mar 2012; 22(1):93-99. PMID 22193978