Dynamic spinal visualization is a way to see how the spine moves as a person bends or twists. It’s thought that looking at moving images could help a healthcare professional diagnose the cause of neck or back pain or other problems with the spine. There are several different ways to create moving images as the spine twists or turns. Most techniques use x-ray to create images on film, a video monitor, or computer screen. Several x-rays are taken, assembled in order, and then played to create a moving image. Other technologies use fluoroscopy and MRI. Because there are not enough medical studies to show how well dynamic spinal visualization works, it’s considered unproven.
The following dynamic spinal visualization techniques are considered investigational, including, but not limited to:

- Digital motion x-ray of the spine
- Cineradiography/videofluoroscopy
- Dynamic magnetic resonance imaging

Vertebral motion analysis (eg, The KineGraph VMA™) is considered investigational.

### Coding

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td></td>
</tr>
<tr>
<td>76120</td>
<td>Cineradiography/videoradiography, except where specifically included</td>
</tr>
<tr>
<td>76125</td>
<td>Cineradiography/videoradiography to complement routine examination (list separately in addition to code for primary procedure)</td>
</tr>
<tr>
<td>76496</td>
<td>Unlisted fluoroscopic procedure (eg, diagnostic, interventional)</td>
</tr>
<tr>
<td>76499</td>
<td>Unlisted diagnostic radiographic procedure</td>
</tr>
</tbody>
</table>

**Note:** CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA). HCPCS codes, descriptions and materials are copyrighted by Centers for Medicare Services (CMS).

### Related Information

N/A

### Evidence Review
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.

Background

Patient Population

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 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 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 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 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**

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 of Evidence**

For individuals who have back or neck 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 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.

Ongoing and Unpublished Clinical Trials

A search of ClinicalTrials.gov in August 2018 did not identify any ongoing or unpublished trials that would likely influence this review.

Practice Guidelines and Position Statements

No guidelines or statements were identified.

Medicare National Coverage

There is no national coverage determination.

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 (k133875). 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. Food and Drug Administration product code: LLZ.
References


History

<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/13/07</td>
<td>Add to Radiology Section - New Policy</td>
</tr>
<tr>
<td>04/08/08</td>
<td>Replace policy - Policy updated with literature search; no change to the policy statement. References added.</td>
</tr>
<tr>
<td>11/10/09</td>
<td>Replace policy - Policy updated with literature search; no change to the policy statement.</td>
</tr>
<tr>
<td>11/09/10</td>
<td>Replace policy - Policy updated with literature review; references 7 and 8 have been added, others removed and reordered. The policy statement remains unchanged.</td>
</tr>
<tr>
<td>11/10/11</td>
<td>Replace policy – Policy updated with literature review through July 2011; no new references added; policy statement unchanged. ICD-10 codes added.</td>
</tr>
<tr>
<td>06/26/12</td>
<td>Related policies updated with the addition of 6.01.513.</td>
</tr>
</tbody>
</table>
### Updates to Policy:

<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/26/12</td>
<td>Update Related Policy – Add 7.01.126; ICD-10 codes are now effective 10/01/2014.</td>
</tr>
<tr>
<td>11/27/12</td>
<td>Replace policy - Policy updated with literature review through July 2012; reference 9 added; policy statement unchanged.</td>
</tr>
<tr>
<td>02/01/13</td>
<td>Update Related Policies, add 8.03.501.</td>
</tr>
<tr>
<td>06/14/13</td>
<td>Update Related Policies. Remove 6.01.513 as it was archived.</td>
</tr>
<tr>
<td>01/21/14</td>
<td>Update Related Policies. Add 7.01.551.</td>
</tr>
<tr>
<td>11/20/14</td>
<td>Annual Review. Policy updated with literature review through July 24, 2014; policy statement unchanged.</td>
</tr>
<tr>
<td>08/31/16</td>
<td>Coding Update. Add CPT code 76496.</td>
</tr>
<tr>
<td>12/01/17</td>
<td>Interim Review, approved November 14, 2017. Policy statement clarified to now include specific dynamic spinal visualization techniques, Hayes reference added.</td>
</tr>
<tr>
<td>12/01/18</td>
<td>Annual Review, approved November 6, 2018. Policy updated with literature review through July 2018; references 7-9 added. Policy title changed from “Dynamic Spinal Visualization” to “Dynamic Spinal Visualization and Vertebral Motion Analysis” Vertebral motion analysis added to policy as investigational.</td>
</tr>
</tbody>
</table>

**Disclaimer:** This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. The Company adopts policies after careful review of published peer-reviewed scientific literature, national guidelines and local standards of practice. Since medical technology is constantly changing, the Company reserves the right to review and update policies as appropriate. Member contracts differ in their benefits. Always consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.

**Scope:** Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.
Discrimination is Against the Law

Premera Blue Cross complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex. Premera does not exclude people or treat them differently because of race, color, national origin, age, disability or sex.

Premera:
- Provides free aids and services to people with disabilities to communicate effectively with us, such as:
  - Qualified sign language interpreters
  - Written information in other formats (large print, audio, accessible electronic formats, other formats)
- Provides free language services to people whose primary language is not English, such as:
  - Qualified interpreters
- Information written in other languages

If you need these services, contact the Civil Rights Coordinator.

If you believe that Premera has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability, or sex, you can file a grievance with:
Civil Rights Coordinator - Complaints and Appeals
PO Box 91102, Seattle, WA 98111
Toll free 855-332-4535, Fax 425-918-5592, TTY 800-842-5357
Email AppealsDepartmentInquiries@Premera.com

You can file a grievance in person or by mail, fax, or email. If you need help filing a grievance, the Civil Rights Coordinator is available to help you.

You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights, electronically through the Office for Civil Rights Complaint Portal, available at https://ocrportal.hhs.gov/ocr/portal/lobby.jsf, or by mail or phone at:
U.S. Department of Health and Human Services
200 Independence Avenue SW, Room S09F, HHH Building
Washington, D.C. 20201, 1-800-368-1019, 800-537-7697 (TDD)

Getting Help in Other Languages

This Notice has Important Information. This notice may have important information about your application or coverage through Premera Blue Cross. There may be key dates in this notice. You may need to take action by certain deadlines to keep your health coverage or help with costs. You have the right to get this information and help in your language at no cost.

Call 800-722-1471 (TTY: 800-842-5357).

Arabic (Arabic):

يكون هذا الإشعار معلومات هامة، فلديه هذه الإشعار معلومات مهمة يخصكم طلب أو عملية التي تحدد الحصول عليه من خلال الطلب. في هذا الإشعار. قد تحتاج إلى إجابة في توضيح عناية به لتحديد على تعرفك على المصادر الصحية أو المساعدة في دفع التكاليف. يقتضي ذلك الحصول على هذه المعلومات والمساعدة بذلك دون كتاب أي أصل.
800-722-1471 (TTY: 800-842-5357)

中文 (Chinese): 本通知有重要的訊息。本通知可能有關於您透過 Premera Blue Cross 提交的申請或相關的重要訊息。本通知內可能有重要日期。您可能需要在截止日期之前採取行動，以保留您的健康保險或費用補貼。您有權利用免費的母語得到本訊息和幫助。請撥電話 800-722-1471 (TTY: 800-842-5357).

Kreyòl ayisyen (Creole):

Daytoy a Pakdaar kòm naglòon iti Napateg nga Impormasion. Daytoy a pakdaar mabalini nga adda kòm naglòon iti napateg nga impormasion maipanjepp iti aplikasyoonyo wouf coverage babaen ti Premera Blue Cross. Daytoy ket mabalini dagiti importante a pensé iti daytoy a pakdaar. Mabalini nga adda rumbeng nga aramideny nga adda sakybay dagiti partikular a naituding nga aldaw tapno mapagtalinaedyo ti coverage ti salun-atyo wenno tulong kadagiti gastos. Adda karbenganyo a mangala iti daytoy nga impormasion ken tulong ti bukyodo a pagasasoa nga awan ti bayadanyo. Tumawag ti numero nga 800-722-1471 (TTY: 800-842-5357).

Italiano (Italian):

Este aviso contiene información importante. Pronto recibirá un aviso con fechas clave para mantener su cubrición de salud o resistir costos. Puede haber fechas importantes en este aviso.

To request a written copy of this information call Premera Blue Cross at 800-722-1471 (TTY: 800-842-5357).

Premera Blue Cross

 kỳ (Vietnamese): Công văn này cung cấp thông tin quan trọng về bảo hiểm y tế. Để có thông tin chi tiết về việc tham gia bảo hiểm y tế, hãy liên hệ với đại diện của Premera Blue Cross.

Türkçe (Turkish): Bu belge sağlık veya ücretlerde önemli tarihler için Premera Blue Cross'a 800-722-1471 (TTY: 800-842-5357) ile başvurun.

한국어 (Korean): 본 통지서에는 중요한 정보가 들어 있습니다. 이 통지서는 키워드와 관련하여 Premera Blue Cross 를 찾을 수 있는 정보를 포함하고 있습니다. 본 통지서에 링크된 웹사이트는 사용자에 대한 자세한 정보를 제공합니다.

한국어 (Korean): 본 통지서에는 중요한 정보가 들어 있습니다. 이 통지서는 키워드와 관련하여 Premera Blue Cross 를 찾을 수 있는 정보를 포함하고 있습니다. 본 통지서에 링크된 웹사이트는 사용자에 대한 자세한 정보를 제공합니다.