



Kansas City

An Independent Licensee of the Blue Cross and Blue Shield Association

## Spinal Ultrasound

**Policy Number:** 6.01.501

**Last Review:** 9/2014

**Origination:** 10/2006

**Next Review:** 9/2015

### **Policy**

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Blue Cross and Blue Shield of Kansas City (Blue KC) will provide coverage for spinal ultrasound when it is determined to be medically necessary because the criteria shown below are met.

### **When Policy Topic is covered**

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Ultrasound of the spine and spinal contents may be considered **medically necessary** when used for the diagnosis of suspected congenital anomalies of the spinal cord on newborns and infants two years of age and younger.

### **When Policy Topic is not covered**

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Ultrasound of the spine and spinal contents is considered **investigational** for all other indications including, but not limited to:

- The evaluation of back pain or radicular symptoms;
- Evaluation of congenital anomalies for individuals over the age of two years.

### **Considerations**

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n/a

### **Description of Procedure or Service**

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Ultrasonography is a noninvasive imaging technique that relies on detection of the reflections or echoes generated as high-frequency sound waves are passed into the body. This technique is commonly used for a number of imaging purposes such as investigation of abdominal and pelvic masses, cardiac echocardiography, and prenatal fetal imaging. Less commonly, it has also been applied to detection of spinal and paraspinal disorders.

Subacute and chronic low back pain is a significant health problem, affecting 60% to 80% of adults in the United States at some time in their lives. In most cases, low back pain is temporary and can be relieved through rest and conservative therapy, but for 5% to 10% of patients, it becomes a chronic and disabling condition. In addition to being one of the leading reasons for visits to primary care physicians, low back pain is one of the most common reasons for nonsurgical hospital admissions in adults under 65 years of age. Low back pain is also a common cause of work-related disability.

There are several applications of spinal ultrasound. This technique has been used for patients with degenerative disc disease to determine whether back pain is a consequence of fissuring or herniation of the gelatinous discs that separate the vertebrae. Another application has been in the assessment of injuries to paraspinal ligaments after spinal fractures. In the United States, there are approximately 10,000 new cases of spinal cord injury per year, primarily due to motor vehicle accidents, violence, falls, or sports injuries. Destruction of motor and sensory neurons often results in paralysis and loss of sensation. The extent of these losses depends both on where the spinal cord is damaged and how extensive is the damage. Although ultrasonography has limited ability to reveal bone and tissues surrounding bone, it has been studied as a means to assess the posterior ligament complex that contributes to the maintenance of spinal stability. Finally, spinal ultrasonography has also been used for

investigation of neonatal spinal dysraphism, a disorder resulting from incomplete closure of the neural tube during gestation. This type of birth defect occurs in approximately 2 per 1000 live births, and the resulting spinal disorders include spinal agenesis, low cord, tethered cord, hydromyelia, diastematomyelia, myelocystocele, and myelomeningocele.

Compared with computed tomography (CT) and magnetic resonance imaging (MRI), ultrasonography provides less detailed images of bone and the structures within and near bone. However, ultrasonography has the advantages of being simpler, more widely available, requiring no x-ray exposure, and having less susceptibility to patient movement. A large number of commercially available ultrasound devices can be used for spinal ultrasonography, including the following: the Aplio™ and the Nemio™ (Toshiba, Tokyo, Japan); Philips® HDI 5000 (Philips Medical Systems, N.A., Bothell, WA); and the ACUSON® Sequoia Echo 256 (Acuson Corp., Mountain View, CA).

## **Rationale**

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Evidence evaluated for this policy was obtained primarily from a search of the peer-reviewed literature in the MEDLINE and EMBASE databases spanning the years 1990 to March 2004. Studies were selected if they had abstracts and were prospective trials that evaluated the sensitivity and specificity of spinal ultrasonography relative to another imaging technique for detection of spinal disorders. Failure to properly evaluate the sensitivity and specificity of ultrasonography led to the exclusion of studies by Rohrschneider et al.<sup>19</sup> and Hughes et al.<sup>20</sup>, who performed MRI only if ultrasonography detected a disorder or was inconclusive.

The literature search identified four small studies and one large trial of spinal ultrasonography that met the criteria for detailed review. The smallest trial enrolled 12 patients with spinal fractures and evaluated posterior ligament complex injury.<sup>16</sup> Another small trial (n=21) enrolled infants with an elevated risk of spinal disorders as indicated by anorectal malformations.<sup>21</sup> The remaining trials evaluated spinal ultrasonography primarily or solely for detection of disc disease.<sup>6,12,13</sup> In all of these studies, the primary outcome measures were the sensitivity and specificity of spinal ultrasonography, with findings from plain radiography, MRI, CT, surgery, or some combination of these methods being relied on to confirm findings and diagnoses.

In a study of just 12 patients, Moon et al.<sup>16</sup> reported 77% sensitivity and 83% specificity of ultrasonography for detection of posterior ligament complex injury after traumatic thoracolumbar spinal fracture in adults. Ultrasonography did not reveal deep spinal muscles or facet joints. In the only study to evaluate spinal ultrasonography for detection of spinal birth defects, Beek et al.,<sup>21</sup> performed spinal ultrasonography, plain radiography, and MRI on 21 infants who were a few days to a few months old. All of these patients had an elevated risk of spinal disorders since they had anorectal malformations that are strongly associated with abnormal spinal development. Only 6 patients had spinal skeletal disorders, and 5 of them also had intraspinal pathology. Although spinal ultrasonography detected all instances of skeletal and intraspinal pathology, the depiction of intraspinal disorders was incomplete in 3 (60%) of the cases, compared with the images obtained by MRI.

The three remaining studies meeting the criteria for this assessment evaluated spinal ultrasonography primarily or solely for the detection of lumbar disc disease. In each of these studies, patients also underwent MRI, CT, discography, and/or surgery, and it was assumed that findings from these other procedures provided inerrant detection of all lumbar disc disease.<sup>6,12,13</sup> The smallest of these three studies (n=29)<sup>6</sup> found that, relative to CT and discography, spinal ultrasonography had 74% sensitivity and 62% specificity for detection of general disc degeneration and 83% sensitivity and 80% specificity for detection of annular disc degeneration. Evliyaoğlu et al.<sup>13</sup> reported that ultrasonography had 81% sensitivity and 94% specificity for the detection of spinal disorders that included disc disease in at least 70% of patients; however, the study population was poorly characterized and the number and types of disorders detected were not reported.

The largest study of spinal ultrasonography for detection of disc disease performed MRI and ultrasonography on 119 patients.<sup>12</sup> The diagnostic capability of ultrasonography varied depending on

the disc examined, with 46% sensitivity and 91% specificity at the L3/4 level, 83% sensitivity and 65% specificity at the L4/5 level, and 78% sensitivity and 67% specificity at the L5/S1 level. This study could not be evaluated fully since it was published in a German-language journal and only the abstract was available in English.

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**76800** Ultrasound, spinal canal and contents  
**76999** Unlisted ultrasound procedure (eg, diagnostic, interventional)

**Additional Policy Key Words**

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N/A

**Policy Implementation/Update Information**

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10/1/06	New policy.
9/1/07	No policy statement changes.
9/1/08	No policy statement changes.
9/1/09	No policy statement changes.
9/1/10	No policy statement changes.
9/1/11	No policy statement changes.
9/1/12	No policy statement changes.
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9/1/14	No policy statement changes.

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