Effective Date: 3/2015

Subject: Surgical Treatment for Idiopathic Scoliosis

Overview: Idiopathic scoliosis is defined as the lateral curvature of the spine greater than 10 degrees and whose cause is unknown. Idiopathic scoliosis is most commonly seen in adolescents, but is also seen in children, infants, and adults. Surgery is indicated in patients who exhibit progressive deformity or when bracing or other treatments have failed or are contraindicated. There are numerous surgical treatments available depending on the severity and location of the scoliosis, including: spinal fusion (anterior and/or posterior), thoracoscopic surgery (VATS, Video-Assisted Thoracoscopic Surgery), osteotomies (bone removal).

Policy and Coverage Criteria:

NOTE: Prior Authorization is NOT required

Harvard Pilgrim considers surgical treatment of idiopathic adult scoliosis medically necessary under the following conditions:

- The patient has a coronal standing Cobb angle ≥ 45 degrees; and
- The patient has tried NSAIDS or acetaminophen ≥ 3 weeks, unless medically contraindicated; and
- The patient has engaged in home exercise or PT ≥ 12 weeks; and
- The patient has modified their activity ≥ 12 weeks; and
- The patient has continued symptoms or findings after treatment,

Harvard Pilgrim considers surgical treatment of idiopathic infantile, juvenile, and adolescent scoliosis medically necessary under the following conditions:

- The patient has a coronal standing Cobb angle ≥ 45 degrees; and
- Follow up X-rays show a curve progression in a skeletally immature patient.

Exclusions: Harvard Pilgrim considers vertebral body stapling experimental/investigational and unproven for the treatment of scoliosis because its long-term effectiveness has not been established.

Supporting Information:

1. Technology Assessment: A number of surgical procedures are indicated for the treatment of scoliosis.
   - Spinal fusion – Spinal fusion surgery involves the fusion of the vertebrae so that they heal into a single, solid bone. A bone graft is typically used during spinal fusion to promote the growth of the bone, leading to fusion. Metal rods are typically placed along the spine to stabilize the spine until the fusion is complete.
     - Posterior approach – The posterior approach to spinal fusion surgery involves accesses the spine through the posterior side of the body. A long incision is made on the back along the spine. Muscles are then pulled away from the spine to allow access and rods and screws are placed to reduce the curvature of the spine. A bone graft that is either taken from the patient or from a cadaver is placed.
     - Anterior approach – The anterior approach is typically used for curves that are present at the thoracolumbar junction, when a patient has a severe deformity, and/or when a patient has an extremely rigid curvature. The anterior approach is performed through an incision at the front or
side of the body and usually requires the removal of a rib. The diaphragm is then released from the chest wall to allow access to the thoracic and lumbar spine. The remainder of the surgery is the same as the posterior approach. Purported advantages of the anterior approach include less blood loss, lower risk of neurologic injury, and no disturbance of the paraspinal muscles.

- Anterior-posterior approach – The anterior-posterior approach is also used in patients with an extremely rigid curvature and in skeletally immature patients to prevent crankshaft phenomenon. In this procedure the spine is accessed through the front and back of the body.

- Thoracoscopic surgery (VATS, Video-Assisted Thoracoscopic Surgery) – VATS is a procedure done in patients with a thoracic curvature. Small incisions are made in the side of the chest where scopes and cameras are inserted to aid the surgeon in observing the spine during surgery. The procedure requires the deflation of one lung temporarily.
- Osteotomies (bone removal) – Osteotomies are sometimes used to improve the correction of a spinal deformity. This procedure may be done during the spinal fusion surgery.
- Vertebral body stapling (VBS) – This procedure is used to potentially reduce or eliminate the need for spinal fusion in the treatment of scoliosis in the thoracic and lumbar spine. In VBS, staples are inserted across growth plates of the vertebrae. The staples are attached to the long side of the spinal curve which guides the spine to stop its curvature while allowing the spine to grow.

2. Literature Review:

Geck et al. (2009) did a multicenter analysis of two groups of patients who were surgically treated for Lenke 5C adolescent idiopathic scoliosis. A total of 62 patients were analyzed: 31 were treated with posterior pedicle fixation surgery; and 31 were treated with anterior dual rod. Analysis showed that patients who were treated with posterior fusion had significantly better curve correction, less loss of correction over time, and shorter hospital stays than those treated with anterior fusion.

Lonner et al. (2009) compared VATS with posterior spinal fusion with thoracic pedicle screws in patients with adolescent idiopathic scoliosis. Seventeen pairs of patients who exhibited similarities in curvature, age, and sex were created. One of the pair received VATS and the other received posterior fusion. VATS patients had significantly longer operative times and significantly less blood loss compared with posterior fusion. The posterior fusion group had significantly improved peak flow measurements compared with VATS.

Stasikelis et al (1998) performed a meta-analysis of the acute correction outcomes in adolescent idiopathic scoliosis. The average coronal curve correction ranged from 48 to 67 percent with posterior instrumentation and 71 to 93 percent with anterior instrumentation.

Merola et al. (2002) did a multicenter study of the outcomes of the surgical treatment of adolescent idiopathic scoliosis. The SRS 24 questionnaire was used to assess the outcome for 242 surgically treated patients. The analysis indicated that patients reported an improved self-image, function, and level of activity at two years post-surgery.

Laituri et al (2012) conducted a retrospective study on 11 patients who underwent thoracoscopic vertebral body stapling (VBS). Of the 11 patients, 7 were followed at 2 years postoperatively. There were no intraoperative complications or mortality. No patient required postoperative bracing or spinal fusion at 2 year follow-up. Laituri concluded that thoracoscopic VBS is a safe and effective method of treatment for progressive scoliosis in young children.

Theologis et al (2013) evaluated whether VBS influenced curve progression between 30 degrees and 39 degrees in children younger than 10 years with idiopathic scoliosis. This population was chose due to patients younger than 10 years with idiopathic scoliosis with a curvature of more than 30 degrees have a 100% risk of progression to spinal fusion. A total of 12 patients were followed over an average of 3.4 years post VBS. The immediate postoperative curve and the curve magnitude at follow-up were significantly less than the preoperative curvature. No patient required definitive fusion for curve progression.

Troeltsch et al (2011) reported results of 28 patients who underwent VBS. Patients were skeletally immature and had curves measuring 20-45 degrees. Follow up ranged from 2-5.3 years following the procedure. Results found improvement in 86% of thoracic curves less than 45 degrees and all lumbar curves.

A 2010 study by Betz et al. reported results of 28 patients followed for a minimum of two years following VBS for idiopathic scoliosis. Analysis of the results found patients with idiopathic scoliosis with high-risk progression treated with VBS showed a success rate of 87% in all lumbar curves and in 79% of thoracic curves <35 degrees. Thoracic curves >35 degrees were not successful and required alternative treatments.
Further studies with larger patient populations are needed to establish the long-term efficacy of this procedure.

3. Professional/Governmental Organizations:

The American Academy of Orthopaedic Surgeon (AAOS) states that if the spinal curvature is more than 45° and the child is still growing, the doctor may recommend surgery. If the patient has reached skeletal maturity, surgery may still be recommended for scoliotic curves that exceed 50° to 55°.

http://orthoinfo.aaos.org/topic.cfm?topic=A00353

Codes:

22800 - Arthrodesis, posterior, for spinal deformity, with or without cast; up to 6 vertebral segments
22802 - Arthrodesis, posterior, for spinal deformity, with or without cast; 7 to 12 vertebral segments
22804 - Arthrodesis, posterior, for spinal deformity, with or without cast; 13 or more vertebral segments
22808 - Arthrodesis, anterior, for spinal deformity, with or without cast; 2 to 3 vertebral segments
22810 - Arthrodesis, anterior, for spinal deformity, with or without cast; 4 to 7 vertebral segments
22812 - Arthrodesis, anterior, for spinal deformity, with or without cast; 8 or more vertebral segments
22818 - Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); single or 2 segments
22819 - Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); 3 or more segments
22845 - Anterior instrumentation; 2 to 3 vertebral segments (List separately in addition to code for primary procedure)
22846 - Anterior instrumentation; 4 to 7 vertebral segments (List separately in addition to code for primary procedure)
22847 - Anterior instrumentation; 8 or more vertebral segments (List separately in addition to code for primary procedure)
22848 - Pelvic fixation (attachment of caudal end of instrumentation to pelvic bony structures) other than sacrum (List separately in addition to code for primary procedure)

References:

3. Scherl, SA. Adolescent idiopathic scoliosis: treatment and prognosis. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA. (Accessed on December 19, 2014.)

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Approved by UMCPC: 5/10/17