Subject: Surgical Treatment for Idiopathic Scoliosis

Background: Idiopathic scoliosis, which is a lateral curvature of the spine that is greater than 10 degrees, is a structural alteration that occurs in various ways. It is typically accompanied by rotation of the spinal column and is most commonly seen in adolescents, but also in children, infants, and adults. Surgery is indicated in patients who exhibit progressive deformity or when bracing or other treatments have failed.

Surgical treatments, such as spinal fusion (anterior and/or posterior), thoracoscopic surgery (VATS, Video-Assisted Thoracoscopic Surgery), osteotomies (bone removal), depends on the severity and location of the scoliosis.

Policy and Coverage Criteria:
Harvard Pilgrim Health Care (HPHC) considers surgical treatment of idiopathic adult scoliosis medically necessary when ALL the following criteria are met:

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

HPHC considers surgical treatment of idiopathic infantile, juvenile, and adolescent scoliosis medically necessary when ALL the following criteria are met:

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

Exclusions: Harvard Pilgrim Health Care (HPHC) considers surgical treatment of idiopathic scoliosis experimental/investigational for all other indications, including expandable growing rods, vertebral tethering, and vertebral body stapling as long-term effectiveness has not been established.

Supporting Information:
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.

Staskelis 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 questionnaires 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 chosen 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.

Trobisch 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.

UpToDate, Inc. (2017) suggests indications for referrals to an orthopedic surgeon if the cobb angle is between 20-29 degrees in premenarchal girls or boys, age 12 to 14 years, the cobb angle is greater than 30 degrees in any patient, progression of cobb angle is greater than or equal to 5 degrees in any patient or the angle of trunk rotation (ATR) is greater than or equal to 7 degrees in individuals with body mass index (BMI) less than 85 or ATR that is greater than or equal to 5 degrees in those with a BMI greater than or equal to 85.

The International Scientific Society on Scoliosis Orthopaedic and Rehabilitation Treatment (SOSORT) recommends in their 2011 guidelines physiotherapeutic specific exercises as part of conservative treatments approaches. Long-term outpatient physiotherapy occurs 2-4 times a week while other therapeutic sessions can be conducted daily or several times a week.
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°.

Coding:

Codes are listed below for informational purposes only, and do not guarantee member coverage or provider reimbursement. The list may not be all-inclusive. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible.

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


Summary of Changes

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<tbody>
<tr>
<td>9/17</td>
<td>Background and references updated</td>
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Approved by UMCPC: 6/28/17
Reviewed/Revised: 7/15; 9/17
Initiated: 7/15