Various overuse injuries may occur, including but not limited to; little leaguer’s shoulder, little leaguer’s elbow, lower extremity stress reactions and fractures, tibial tuberosity apophysitis (Osgood-Schlatter's disease), calcaneal apophysitis (Sever’s disease) and lumbar spondylolysis.

Incidence of back pain and higher prevalence of spondylolysis is being seen in various athletic groups. Up to 47% of 100 young patients present to sports injury clinics with lower back pain had spondylolysis. Diagnosis of disorders causing back pain in student athletes from the age of adolescent growth spurt through college should include stress reaction/ stress fractures of the posterior arches of the lumbar vertebrae.

Adolescent spondylolysis may occur with and without symptoms of lower back pain. However, in athletes with lower back pain, spondylolysis should be highly considered. However, lower back pain in teenagers and young adults is often written off as “growing pains,” or as a simple strain/sprain injury. Pain may be localized at the paraspinal region or have additional referring pain to the iliac crest region, gluteal region, or posterior thigh. Pain is generally relieved with restful periods, only to increase again with recommencement of activity. Patients may have dull, nagging pain for weeks or months and then have a single event, or just ever increasing pain that will cause them to seek the attention of a healthcare provider.

Stress fractures of the posterior elements of the lumbar spine are the most common stress fractures in the body. The pars interarticularis of the vertebrae is the stress point for flexion/extension maneuvers of the lumbar spine. Too many repetitions in practice and perhaps poor form, poor core strength, and tightness of the muscles/tendons of the lower extremity are all contributors to over stressing the posterior arch structures.

Accurate and timely diagnosis can potentially allow an acute or “active” spondylolysis to heal. Plain film radiography is commonly the initial imaging modality. However, plain film radiographs may demonstrate less than 30% of pars defects and other imaging is required. Computed tomography and SPECT bone scan of both have been used for assessment of spondylolysis and have high-sensitivity for both anatomic detail and for physiologic information regarding healing status. However, there is also radiation exposure with both of these modalities. Magnetic resonance imaging can also demonstrate spondylolysis and provides both anatomic and physiologic information.

Several studies have correlated the edema reaction shown on MRI as being predictive of healing of the spondylolysis. MRI can also be used as a follow-up modality to monitor healing, and as a reduction of bone marrow edema in the pedicle and posterior arch structures. MRI does NOT expose these young patients to radiation. MRI can be used as an initial imaging modality in the evaluation of lower back pain in adolescent patients, again because of lack of radiation exposure and because it can effectively demonstrate the pars interarticularis anatomically and evaluate the physiologic response of the stress reaction by showing bone marrow edema. The edema presents as a decreased signal in the bone on T1 weighted images and an increased signal on T2 weighted and Inversion Recovery or Fat saturation images.

Lower back pain from spondylolysis commonly presents with pain on
extension. This is similar to pain with facet joint syndrome and mechanical lower back pain. Manipulation is contraindicated in the setting of an acute or “active” spondylolysis. However, manipulation would be indicated in the setting of a facet syndrome. To differentiate between the two disorders is vitally important for the chiropractor contemplating manipulation as a treatment for a particular patient. MRI can be effectively used in help to make this differentiation. MRI will also aid in ruling out other sources of pain that may include intervertebral disc derangement, Schmorl's nodes, anterior ring apophyseal injuries, or other ominous and rare conditions such as neoplasia or infections.

Treatment goals include reduction of pain, union of the spondylolysis defects, and prevention of additional injuries. Treatment options for acute or active spondylolysis include rest or activity modification with “active rest.” Patients are taken out of active sports participation and placed on an exercise program that does not include extension or extension/rotation maneuvers of the lumbar spine. Physiotherapy modalities to reduce pain and increase healing response are reasonable, and there have been a couple of studies on external bone growth stimulators, but more research is needed. Bracing the spine with thoracolumbosacral orthosis is somewhat controversial. Some authors have had good outcomes with using soft corset with activity modification. Treatment times vary but are generally 6-12 weeks rest with repeat imaging to determine healing. If pain continues after bracing and there is continued non-union, then some authors recommend surgical fixation. Core strength rehabilitation seems important for healing and will likely play a large role in prevention. Hamstring flexibility is discussed in many articles. Hamstring tightness can accentuate the stresses to the lumbosacral junction during certain sport positions and activities, such as hurdles in track.

Spondylolysis in the young athlete is a common cause of back pain and should not be confused with facet syndrome or discounted as simple strain/sprain or growing pains. Treating chiropractors must keep this diagnosis in mind when dealing with adolescents with back pain, as manual manipulative techniques may not be indicated (contra-indicated) while the stress reaction or fracture is active or healing.

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References
**Case Study:** 18-year-old basketball athlete with back pain:

Plain film radiographs: No spondylolysis is seen

SPECT Bone scan shows uptake at left L5 pedicle/pars region.
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