

# Spondylolysis and Spondylolisthesis

## Description

The most common X-ray identified cause of low back pain in adolescent athletes is a stress fracture in one of the bones (vertebrae) that make up the spinal column. Technically, this condition is called spondylolysis (spon-dee-low-lye-sis). It usually affects the fifth lumbar vertebra in the lower back, and much less commonly, the fourth lumbar vertebra.

If the stress fracture weakens the bone so much that it is unable to maintain its proper position, the vertebra can start to shift out of place. This condition is called spondylolisthesis (spon-dee-low-lis-thee-sis). If too much slippage occurs, the bones may begin to press on nerves and surgery may be necessary to correct the condition.

## Risk Factors/Prevention

**Genetics:** There may be a hereditary aspect to spondylolysis. An individual may be born with thin vertebral bone and therefore be vulnerable to this condition. Significant periods of rapid growth may encourage slippage.

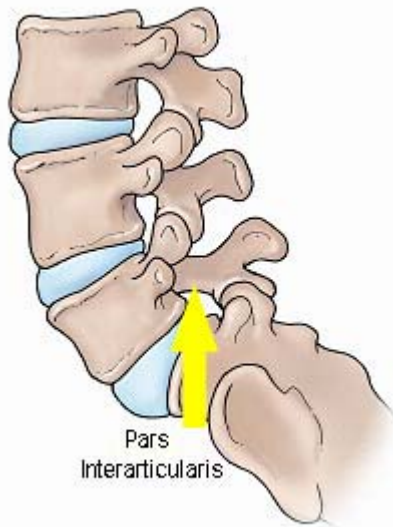
**Overuse:** Some sports, such as gymnastics, weight lifting and football, put a great deal of stress on the bones in the lower back. They also require that the athlete constantly over-stretch (hyperextend) the spine. In either case, the result is a stress fracture on one or both sides of the vertebra.

## Symptoms

- In many people, spondylolysis and spondylolisthesis are present, but without any obvious symptoms.
- Pain usually spreads across the lower back, and may feel like a muscle strain.
- Spondylolisthesis can cause spasms that stiffen the back and tighten the hamstring muscles, resulting in changes to posture and gait. If the slippage is significant, it may begin to compress the nerves and narrow the spinal canal.

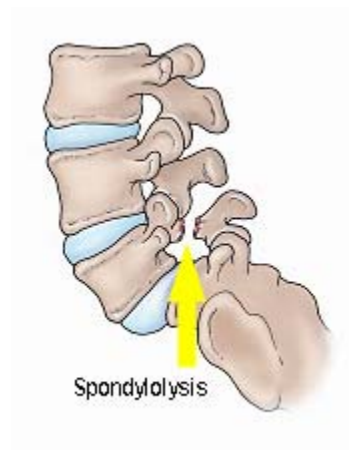
## Diagnostic tests

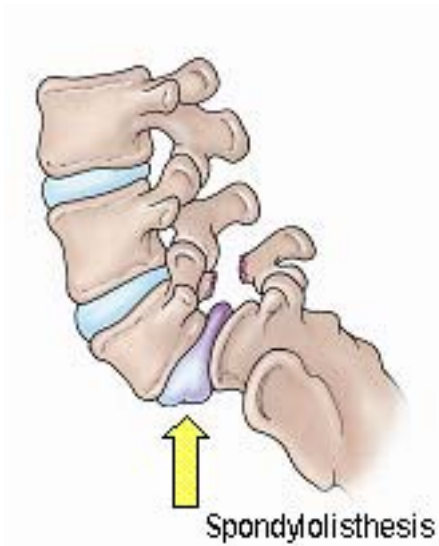
X-rays of the lower back (lumbar) spine will show the position of the vertebra.



The pars interarticularis is a portion of the lumbar spine. It joins together the upper and lower joints. The pars is normal in the vast majority of children.

If the pars “cracks” or fractures, the condition is called spondylolysis. The X-ray confirms the bony abnormality.





If the fracture gap at the pars widens, then the condition is called spondylolisthesis. Widening of the gap leads to the fifth lumbar vertebra shifting. It shifts forward on the part of the pelvic bone called the sacrum. The doctor measures standing lateral spine X-rays. This determines the amount of forward slippage.

If the vertebra is pressing on nerves, a CT scan or MRI may be needed before treatment begins to further assess the abnormality.



This lateral radiograph of the lumbosacral spine demonstrates the forward shift in the fifth lumbar vertebra on the sacrum (L5-S1 spondylolisthesis)

## Treatment Options

Initial treatment for spondylolysis is always conservative. The individual should take a break from the activities until symptoms go away, as they

often do. Anti-inflammatory medications such as ibuprofen may help reduce back pain. Occasionally, a back brace and physical therapy may be recommended. In most cases, activities can be resumed gradually and there will be few complications or recurrences. Stretching and strengthening exercises for the back and abnormal muscles can help prevent future recurrences of pain.

Periodic X-rays will show whether the vertebra is continuing to slip.

### **Treatment Options: Surgical**

Surgery may be needed if slippage continues or if the back pain does not respond to conservative treatment and begins to interfere with activities of daily living. A spinal fusion is performed between the lumbar vertebra and the sacrum. Sometimes, an internal brace of screws and rods is used to hold together the vertebra as the fusion heals.

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