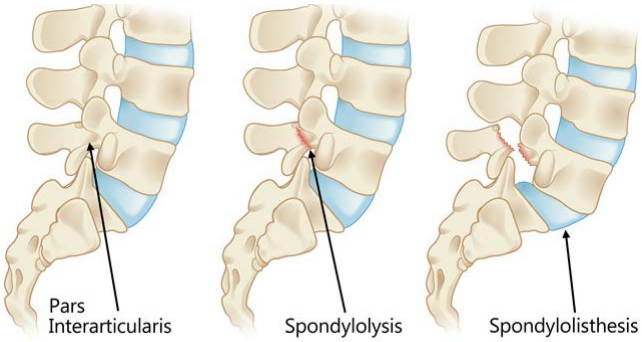
Spondylolysis and Spondylolisthesis

What are they?

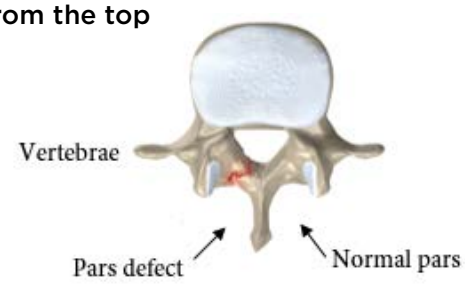
Spondylolysis (sounds like spon-dee-low-lye-sis) is a crack in part of a vertebra (bone in the spine) called the pars interarticularis. The pars is in a thin part of the vertebrae that can crack from repetitive force. This crack is sometimes also referred to as a "pars defect" or "stress fracture."

Spondylolisthesis (sounds like spon-dee-low-lis-thee-sis) is a shift of one vertebrae forward on another. In children and adolescents, spondylolisthesis usually occurs due to a spondylolysis, but it can be caused by other abnormalities in the shapes of the vertebrae or joints between them.

Spine from the side



Spine from the top



What are the most common causes?

Spondylolysis and Spondylolisthesis

Both spondylolysis and spondylolisthesis are most common in the lower (lumbar) spine, at the 5th lumbar vertebra. They are common in adolescent athletes, particularly gymnasts, weightlifters, football linemen and dancers. This is a result of repetitive high impact stresses, mainly those that involve bending backwards, on this area of the back. It is also common in conditions such as Marfan syndrome or neurofibromatosis, where the ligaments are very loose and elastic.

What are the signs of spondylolysis and spondylolisthesis?

Many patients with a spondylolysis show no symptoms, but some may have lower back pain.

- Low back pain - this back pain is often worse with leaning back and improves with rest and inactivity.
- Feeling tightness or stiffness in the lower back or hamstrings.
- Initially the pain may get bad enough during sports activities that your child cannot finish the practice or game.
- Your child may or may not have a tingling discomfort down the back of one or both legs.
- In advanced and severe spondylolisthesis, the way your child stands or walks may start looking very odd.

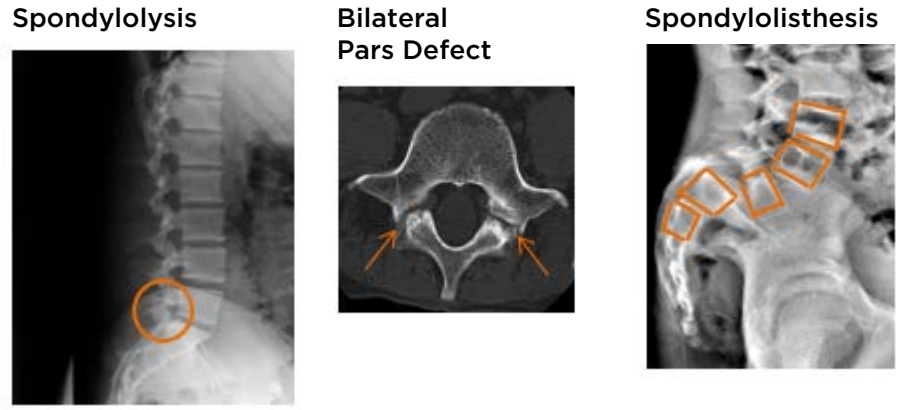
How are they diagnosed?

Spondylolysis

Active children who get a lot of lower back pain during activities often have a spondylolysis. It is likely that your child has this condition if the pain is brought on by leaning backwards and is still present after 2 weeks from the start of pain. About 4 out of every 5 cases of chronic spondylolysis can be seen on X-ray. It is easier to see if the X-ray is done while standing up instead of lying down. However, within the first 3 to 4 weeks from the start of symptoms, an X-ray can be normal. Tests such as a CT scan, MRI and bone scan are sometimes needed to diagnose or find the best treatment option.

Spondylolisthesis

Spondylolisthesis is diagnosed by X-ray. Severe spondylolisthesis can be suspected by a specific and abnormal standing or walking posture. Tests such as a CT scan, MRI and bone scan are sometimes needed to diagnose or find the best treatment option.



Images on X-ray and CT scan

What are the treatment options?

Our goal is to reduce your child's pain and discomfort while making sure it is OK for them to resume their daily activities. The most common treatment options recommended by spine specialists are rest, wearing a brace, physical therapy and medications. Surgery is not commonly needed for spondylolysis in children.

Acute spondylolysis (within 2 months of the first onset of back pain)

The initial treatment for acute spondylolysis is rest, stopping sports or activities, and in some cases wearing a back brace. The goal is to get the crack in the bone to heal back together.

- Activities that include bending backwards too much or those that cause pain should be avoided. High impact activities such as running, basketball, soccer, heavy lifting and PE at school also should be avoided in the first 6 weeks or longer. Walking and going to school are OK.
- Ice can be applied for 10 to 15 minutes, every 2 to 3 hours. Ice should never be applied directly on the skin.
- Anti-inflammatory medications such as ibuprofen or meloxicam may be used to help decrease pain. You should let your medical provider know if you are taking these medications.
- Physical therapy is usually delayed for 6 to 12 weeks to allow for bone healing.

Chronic spondylolysis (2 months or longer after onset of pain) and spondylolisthesis

- Physical therapy helps to strengthen the surrounding muscles and tissues to support and relieve the crack in the bone from stress. Physical therapy is often used for spondylolisthesis and chronic back pain. It will often take 8 weeks or more of daily exercises to see a large improvement.
- Pain can return many months or years later if the area is re-aggravated. Sometimes the flare-up of pain will resolve quickly, but if it persists, treatment can be restarted with anti-inflammatories and physical therapy.
- If pain persists despite these treatments for longer than 6 to 12 months, surgery may be considered.
- In rare circumstances of severe spondylolisthesis, surgery is considered the only appropriate treatment.

What are the possible complications?

- In the case of acute spondylolysis, despite rest and brace treatment starting early, the bone defect may never heal with bone, but with scar tissue instead. This then becomes a chronic spondylolysis or spondylolisthesis, but can feel and act healed without problems.
- Some children develop chronic pain that may get in the way of their daily activities or sports, but this is not common. Even in the presence of some lower back pain, most activities are tolerated.

To Learn More

- Orthopedics 206-987-2109
- Ask your child's healthcare provider
- www.seattlechildrens.org

Free Interpreter Services

- In the hospital, ask your child's nurse.
- From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.

- For most children, after the healing stage is complete severe problems are very rare, and surgery is not needed.
- Nerve compression causing leg dysfunction is very rare, and almost never happens all of a sudden.

How can they be prevented?

- Three percent of children by age 5 have developed a spondylolysis or spondylolisthesis and most have no symptoms. Children that develop this problem later, particularly while involved in sports are more likely to have pain in their back.
- Theoretically, avoiding repetitive and excessive high impact activities especially those involving hyperextension (kicking, jumping, running, back bends) would minimize the risk of developing a spondylolysis. However, most common childhood and adolescent recreational and competitive sports require these activities and are tolerated well by children.
- It is possible but not proven that good core strength and training in more low impact activities might reduce the risk of developing spondylolysis.

Seattle Children's offers interpreter services for Deaf, hard of hearing or non-English speaking patients, family members and legal representatives free of charge. Seattle Children's will make this information available in alternate formats upon request. Call the Family Resource Center at 206-987-2201.

This handout has been reviewed by clinical staff at Seattle Children's. However, your child's needs are unique. Before you act or rely upon this information, please talk with your child's healthcare provider.

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