PROCEDURE

Scoliosis surgery in children

Scoliosis surgery straightens and stabilizes a child's curved spine using implants, often with spinal fusion.

PURPOSE
Straighten and stabilize a worsening spinal curve

PROCEDURE TYPE
Therapeutic; surgical fusion using rods and screws

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General

HOW LONG IT TAKES
About 4 to 8 hours

PREPARATION
Fasting, medication review, blood tests, and infection screening

RECOVERY
Several hospital days; no driving until cleared

MAIN RISKS
Infection, bleeding, nerve injury, implant or fusion problems

RESULTS
Correction seen immediately; fusion develops over months

Overview

Scoliosis surgery is an operation to correct and stabilize an abnormal sideways curve of the spine. It is usually considered when a curve is severe, is continuing to worsen, or is unlikely to be controlled with a brace.

The most common operation is posterior spinal fusion. "Posterior" means the surgeon reaches the spine through the back. Screws and rods hold the spine in a safer, more balanced position. Bone graft is placed along the spine so selected vertebrae-the bones of the spine-gradually join into one solid section.

The aim is not always to make the spine perfectly straight. The surgical team balances correction against spinal cord safety, body alignment, remaining growth, and preserving movement where possible.

Some younger children may have growth-friendly implants instead of an immediate permanent fusion.

Why the procedure is performed

Surgery may be offered when the healthcare team expects the curve to keep progressing and believes the likely benefits outweigh the risks. Reasons can include:

For adolescent idiopathic scoliosis, meaning scoliosis without an identified underlying cause, surgery is often discussed when a curve approaches or exceeds about 45 to 50 degrees. The decision is individual and also considers age, growth remaining, curve pattern, and progression.

- A large or steadily worsening curve
- Progression despite bracing
- Significant imbalance of the shoulders or trunk
- Pain or reduced function linked to the spinal deformity
- Concern that a severe curve may affect chest space or breathing
- A curve caused by a condition affecting nerves, muscles, or spinal development

Who should and should not have it

Scoliosis surgery is not needed for every child with scoliosis. Small or stable curves can often be monitored. Moderate curves in a growing child may be treated with a brace.

A child may be considered for surgery if the curve is severe or progressive and observation or bracing is unlikely to provide enough control. The team will also consider the child's overall health, maturity, goals, and ability to manage recovery.

Surgery may be delayed if the child has:

Some health conditions do not rule out surgery but require extra planning. Children with complex heart, lung, muscle, nerve, or genetic conditions may need assessment by several specialists.

The surgeon should explain which operation is being proposed, why it fits your child's curve, and what could happen with or without surgery.

- An active infection or open skin problem near the surgical area
- Poorly controlled heart, lung, bleeding, or other medical problems

- Poor nutrition that could interfere with healing
- A recent illness that increases anaesthesia risks
- A curve that can still be managed safely without surgery

How to prepare

The treating facility's own instructions take priority because preparation differs between hospitals and operations.

Your child may have spinal X-rays, blood tests, and an examination before surgery. Some children need breathing tests, heart tests, or additional imaging. The team may also arrange blood-management planning because this operation can involve significant blood loss.

Give the team a complete list of medicines, vitamins, and supplements. Some medicines can affect bleeding or anaesthesia. Do not stop a prescribed medicine unless the treating team tells you when and how to do so.

Follow the hospital's instructions about when your child must stop eating and drinking. Tell the team about fever, cough, skin sores, dental infections, or other new illnesses before the operation.

Plan for several days in hospital and help at home afterward. Ask the school about missed work and practical support during the return to classes.

What happens during the procedure

Your child receives general anaesthesia and is fully unconscious. The anaesthesia team monitors breathing, heart rate, blood pressure, temperature, and other vital signs.

For a typical posterior spinal fusion, your child lies face down on a padded operating table. The surgeon makes an incision along the back and places anchors, usually screws, into selected vertebrae. Rods connect the anchors and help bring the spine into a safer position.

The team monitors signals travelling through the spinal cord and nerves during surgery. This helps identify changes that could indicate pressure or reduced function.

Bone graft is placed across the vertebrae that need to fuse. The graft may include processed donor bone, synthetic material, or your child's own bone. The wound is then closed and covered with a dressing.

Some children receive growing rods or another growth-friendly system. These control the

curve while allowing more spinal or chest growth. They may require later adjustments or operations.

Recovery and what to expect afterward

Pain is usually strongest during the first few days. The team will provide regular pain relief and may use several types of medicine. Pain should gradually improve, although stiffness and muscle discomfort can continue for several weeks.

Your child will start with fluids and then return to food as alertness and nausea allow. Constipation is common after major surgery because of pain medicines and reduced movement. Fluids, movement, and the bowel plan provided by the hospital can help.

Staff usually help your child sit, stand, and walk soon after surgery. At home, walking is encouraged, but bending, twisting, heavy lifting, sports, and rough play are restricted until the surgeon says they are safe. A brace is not always required after modern spinal fusion.

Your child must not drive home. An adult should provide transport. A teenager should not resume driving while taking medicines that cause drowsiness, while movement is restricted, or until the surgical team has cleared driving.

Returning to school often takes several weeks. A gradual return or shorter school days may help. Older teenagers with jobs should follow the same restrictions and discuss physical duties with the surgical team.

Risks and possible complications

Scoliosis surgery is major surgery. The team should discuss your child's individual risk before consent.

Possible complications include:

The likelihood and type of complications differ according to the curve, operation, underlying condition, and child's health.

- Bleeding, sometimes requiring a blood transfusion
- Infection involving the skin, deeper tissues, or implants
- Injury to the spinal cord or nerves, causing weakness, numbness, or rarely paralysis
- A tear in the covering around the spinal cord, causing spinal fluid leakage
- Breathing problems, blood clots, or reactions to anaesthesia

- Screws or rods moving, loosening, or breaking
- Failure of the bones to fuse fully, called nonunion or pseudarthrosis
- Loss of correction or progression in an unfused part of the spine
- Ongoing pain or the need for another operation

Results and follow up

The change in spinal alignment can usually be seen on X-rays soon after surgery. The surgeon will also check balance, strength, sensation, and wound healing.

Fusion does not happen immediately. The bone strengthens and joins over many months. Follow-up visits and X-rays are used to check alignment, implants, and fusion progress.

A fused section no longer grows or bends normally. The surgical team plans the fusion levels carefully to preserve movement and growth where possible. Your child may still have a visible curve or unevenness after surgery, even when the result is considered successful.

Routine follow-up usually continues for months and sometimes years, particularly while the child is growing.

Alternatives

The realistic alternatives depend on the curve and how much growth remains.

Ask how each option changes the chance of progression, future surgery, spinal movement, and remaining growth.

- Observation: Avoids treatment now but requires regular examinations and X-rays. A progressing curve may become harder to treat later.
- Bracing: Can reduce the chance that some curves worsen during growth. It does not reliably correct a severe established curve and requires many hours of wear.
- Scoliosis-specific exercises or physiotherapy: May improve strength, posture, comfort, and function. Exercises alone may not stop a severe progressive curve.
- Serial casting: Sometimes used in infants and young children. It may guide growth or delay surgery but requires repeated cast changes, often under anaesthesia.
- Growth-friendly rods: Preserve more growth than early fusion but usually require repeated lengthening, replacement, or later fusion.

- Vertebral body tethering: Uses a flexible cord to guide growth without fusion in selected growing children. Results are less predictable than fusion, and further surgery may be needed.
- No active treatment: Avoids surgical risks but accepts the possibility of continued progression, imbalance, pain, or breathing effects.

When to call your healthcare team

Contact the surgical team promptly for a wound that becomes more red, swollen, warm, open, or begins draining. Also call for fever at the threshold given by the hospital, worsening pain, repeated vomiting, inability to drink, new numbness, new weakness, or loss of bladder or bowel control.

Questions about dressings, constipation, medication side effects, school, or activity restrictions are usually suitable for routine contact during office hours.

Seek emergency help for difficulty breathing, chest pain, fainting, uncontrolled bleeding, sudden severe weakness, or inability to move an arm or leg. Follow the hospital's discharge instructions if they set out a different urgent-care plan.

Common questions

Will my child be asleep?

Yes. Scoliosis surgery is performed under general anaesthesia. Your child will be unconscious and will not feel the operation.

Can my child drive home?

No. An adult must provide transport. Teenagers should not drive again until they are off sedating pain medicine, can move safely, and have been cleared by the surgical team.

How painful is scoliosis surgery?

Significant pain and stiffness are expected at first, especially during the first few days. Pain relief, careful positioning, and gradual movement usually make it more manageable as healing continues.

How long will my child stay in hospital?

Many children stay for several days. The timing is based on pain control, walking, eating and drinking, bladder and bowel function, and the child's overall recovery.

When will we know whether it worked?

The correction is visible on early X-rays. Successful fusion can only be confirmed over time as the bone heals, usually through examinations and later imaging.

Will another operation be needed?

A planned second operation is not usual after uncomplicated permanent fusion. Growth-friendly systems often require later procedures, and any child may need further surgery if an implant or fusion problem develops.

Sources

- American Academy of Orthopaedic Surgeons. Surgical Treatment for Scoliosis . OrthoInfo.
- Scoliosis Research Society. Surgery for Scoliosis and patient treatment resources.
- NHS. Scoliosis: Treatment in Children and Young People .
- National Institute for Health and Care Excellence. Vertebral Body Tethering for Idiopathic Scoliosis in Children and Young People . Interventional Procedures Guidance IPG728, 2022.
- Pediatric Orthopaedic Society of North America. Adolescent Idiopathic Scoliosis . POSNA Study Guide.