Curve Checks

Scoliosis Screening Reference Guide

Children's^{SM}
Healthcare of Atlanta

Scoliosis Screening Program
404-255-1933
choa.org/scoliosisresources

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The American Academy of Orthopaedic Surgeons, Scoliosis Research Society, Pediatric Orthopaedic Society of North America and American Academy of Pediatrics agree that an effective scoliosis screening program helps recognize the deformity early, when a variety of treatments are available.

This guide is designed to be used with the Curve Checks video series, the Curve Checks video series quiz and an individualized scoliosis screening form.

This guide is dedicated to the many volunteers who perform scoliosis screenings in schools. Thank you for giving your time to this important process.

Scoliosis Screening Reference Guide

This Curve Checks Scoliosis Screening Reference Guide explains what scoliosis is and how to screen for the condition. As a screener, your role is critical. You make the experience comfortable for students, and your efforts can help identify a condition that can become severe if left undiagnosed.

The guide is to be used in conjunction with the Curve Checks video series available at choa.org/scoliosisresources.

Scoliosis screening programs are designed to assess for conditions that may otherwise go undetected. This guide gives you the basis for becoming a screener. Repeating the step-by-step process will help give you the experience to identify possible signs of scoliosis. If you have any questions about a student you have screened, inform the program leader present at the screening.

Thank you for generously sharing your time and talents.

In this guide:

GLOSSARY

Adolescence—Growth period between the ages of 9 and 16

Idiopathic—Having no known cause

Iliac crest—Top of the pelvis, or hip bone

Kyphosis—Rounded back when looking at the child from the side

Lumbar—Lower part of the spine

Radiograph—Image made by radiation, usually an X-ray

Scoliosis—Sideways curve of the spine when looking at the child from the side

Skeletal maturity—The point at which bones have stopped growing

Thoracic—Midsection of the body, between the neck and waist

Vertebrae—Bone segments making up the spinal column, or backbone

What is scoliosis?

Scoliosis is a condition in which the spine curves or bends to the side. Some curving of the spine, typically 10 degrees or less, is considered normal. If you notice any of the below indicators, the child you are screening might have scoliosis.

- One shoulder may be higher than the other.
- One shoulder blade may protrude more than the other.
- One hip may be more prominent than the other.
- Vertebrae (bone segments making up the spine) may twist or rotate, producing a prominence on one side of the back and opposite side of the chest.

An X-ray determines if a curve is greater than 10 degrees. Curves greater than 20 degrees are more likely to progress, or get worse, as the child grows. Scoliosis is best treated early, but most parents do not know or recognize the signs of scoliosis in their child. By knowing the signs, you may be able to help prevent problems later in life. Left untreated, some curves can increase to 40, 50 or 60 degrees— or more—leading to:

- Chronic back pain
- Pressure on heart and lungs
- Osteoarthritis
- Significant deformity of the spine

Common types of scoliosis

There are three common types of scoliosis:

- Congenital—malformed or misshapen vertebrae at birth
- Neuromuscular—associated with other conditions
- Idiopathic—most common type, which develops over time
  - Affects 2 to 3 percent of the population
  - Happens during preadolescence or the adolescent growth spurt
  - Cause is unknown
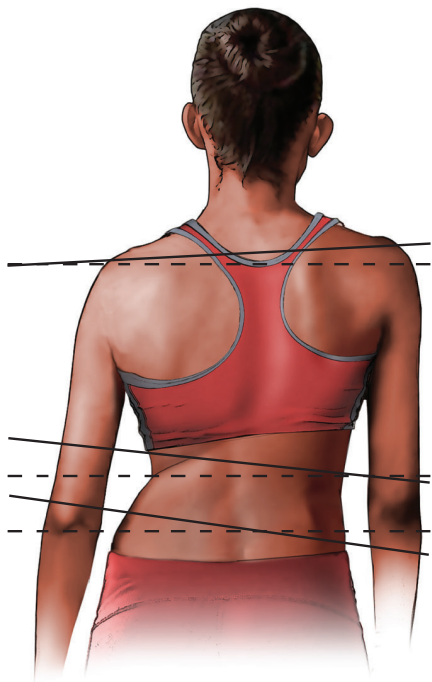
Common asymmetries due to scoliosis. Note the lines that show uneven shoulders, ribs and hips.

Radiographs of different kinds of curves from 9 to 85 degrees

Thoracolumbar curve
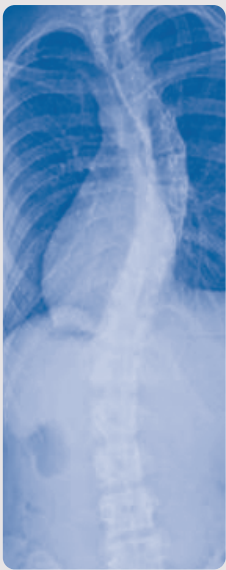9 degrees
Spinal asymmetry

Lumbar curve
15 degrees
Orthopedic observation with periodic rechecks

Thoracolumbar curve
26 degrees
Orthopedic intervention may include spinal brace

Double curve—S-shaped
30 degrees
Orthopedic intervention and observation over lifetime

Primary thoracic/compensatory lumbar
52 degrees/30 degrees
Surgical intervention

Thoracic curve
85 degrees
Risk of shortness of breath and decreased lung function

There is potential for significant psychological stress from spinal deformity due to societal emphasis on appearance and health.

Why is screening important?

Children should be screened in the adolescent years between ages 9 and 16, when they are most at risk for developing scoliosis. When curves are small, they are not always obvious. Small curves have small deformities. If we can identify these curves early, we can prevent progression of the curve.

Scoliosis facts

- Idiopathic scoliosis is the most common, and the cause is unknown.
- Scoliosis usually occurs during an adolescent growth spurt.
- Scoliosis tends to run in families.
- Scoliosis affects 2% to 3% of the adolescent population. Approximately two or three out of every 100 students you screen will actually have scoliosis.

How is scoliosis treated?

There are three treatment options: observation, bracing and surgery.

- All curves are at risk for progression.
- Risk of progression depends on how big the curve is and how much bone growth remains.
- The treatment goal is to keep the curve sufficiently small until bone growth is complete.
- If there is a small curve with a small risk of progression, that curve is observed (rechecked) to make sure the curve does not get worse.
- If there is a small curve with a large risk of progression, that curve is braced to make sure it does not get worse.
- If there is a large curve with a large risk of progression, surgery may be required.

What is my role as a screener?

Research shows that early screening for scoliosis can help to prevent problems or surgery later in life.

- As a screener, you often catch scoliosis when brace treatment will still be effective.
- You will not diagnose scoliosis.
- The Scoliosis Screening Program is designed to identify those who are more likely to have scoliosis.
- There is not a definite test for scoliosis. As a screener, you look closely for signs of the condition. You will become more accurate with time. Training will help you avoid false readings.
- False positives and false negatives can occur.
  - False negatives are students who have scoliosis but are not identified in the screening process.
  - False positives are students who do not have scoliosis but are identified and referred to their primary doctor.

Screening preparation

- Screening takes less than one minute.
- Screen boys and girls separately.
- Through training, you will learn how to put children at ease and how to find the signs that indicate a potential problem.

How to prepare the screening area:

- Designate areas where each child can be screened separately.
- The floor should be stable and even.
- Place tape on the floor to let the child know where to stand and to mark the placement of the screener's chair.
- Placing a level line of tape on the wall behind the screening area can be helpful to note uneven shoulders.
- The screener's eyes should be at the height of the child's shoulders, so the screener may need to sit or stand.
- The area should have adequate lighting to prevent a shadow crossing the body.
- Keep the room temperature comfortable for removing shirts.

You may need to guide the child through the screening process, repeating the directions to help the child stand and bend correctly.

Screening process

Use with Curve Checks video series, Curve Checks video series quiz and individualized screening form. **You can view the video series at choa.org/scoliosisresources.**

A successful scoliosis screening program

A successful scoliosis screening program must be a process with numerous activities completed before and after the examination.

Although schools do things differently, most or all of the following steps are necessary for a successful program:

- Recruit and train volunteers.
- Create a screening schedule.
- Coordinate with teachers.
- Notify parents.
- Inform students of the screening and share the screening illustrations on choa.org/scoliosisscreening.
- Arrange a private screening area.
- Prepare and distribute screening forms.
- Conduct the screening.
- Identify students who have possible signs of scoliosis and refer them for further evaluation.

Five-step screening process

1. Examine the student from the front, in a standing position.
2. Examine the student from the front, bending toward you.
3. Examine the student from the back, in a standing position.
4. Examine the student from the back, bending away from you.
5. Examine the student from the side, in a bending position.

Five-step screening process

First position: Front, standing position

Instructions to the child:

- Face the screener. Put your feet together with equal weight on both legs.
- Breathe in. Let it out, and relax your shoulders. Let your arms hang naturally at your sides.

Look for (see Figure 1):

- Uneven shoulders (Is one shoulder higher?)
- Arm hanging out farther from body on one side
- Hip that appears higher on one side

Second position: Front, bending forward (Adams Forward Bend Test)

Instructions to the child (see Figure 2):

- Put your palms together with arms out straight.
- Put your chin on your chest and roll down until your hands touch your feet.

Note: Encourage the child to continue to roll down as far as possible until her back is parallel to the floor. Have the child repeat the Adams Forward Bend Test if she rolls down too quickly or if she rolls down to one side or the other. The child's hands should be pointing at her big toes.

Look for (see Figure 3):

- Upper rib prominence on one side
- Lower rib prominence on one side
- Lower back (lumbar) prominence on one side

Figure 1
Normal   Abnormal
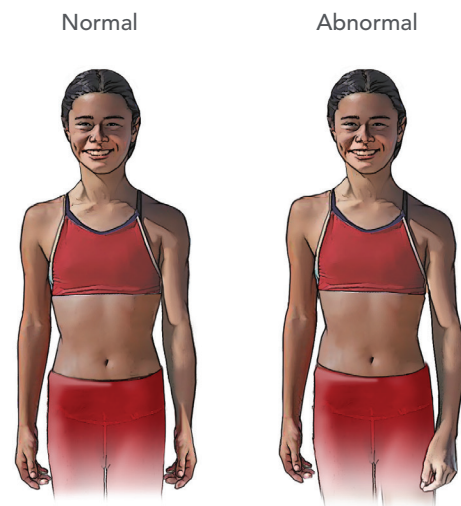
Figure 2

Figure 3
Normal   Abnormal

Third position: Back, standing position

Instructions to the child:

- Turn around (child's back is now to screener). Put your feet together with your weight equally on both legs.
- Breathe in. Let it out and relax your shoulders. Let your arms hang naturally at your sides.

Look for (see Figure 4):

- Uneven shoulders (Is one shoulder higher?)
- Shoulder blade (scapula) more prominent or higher than other
- Arm hanging out farther from body on one side
- Waist fold deeper on one side

Fourth position: Back, bending away (Adams Forward Bend Test)

Instructions to the child:

- Put your palms together with arms out straight.
- Put your chin on your chest and roll down until your hands touch your feet.

Note: Encourage the child to continue to roll down as far as possible until her back is parallel to the floor. Have the child repeat the Adams Forward Bend Test if she rolls down too quickly or if she rolls down to one side or the other. The child's hands should be pointing at her big toes.

Look for (see Figure 5):

- Upper rib prominence on one side
- Lower rib prominence on one side
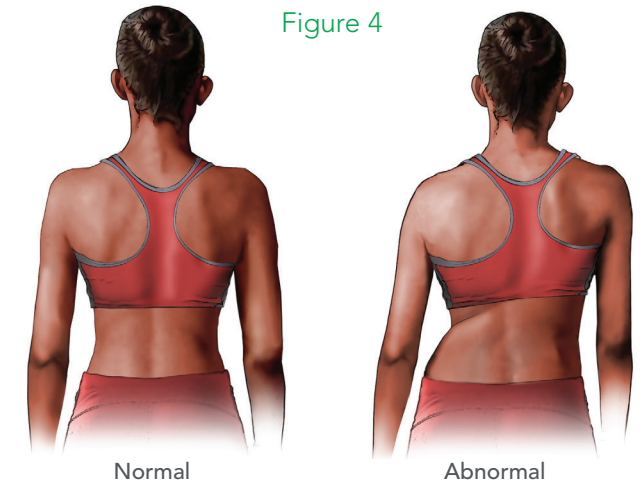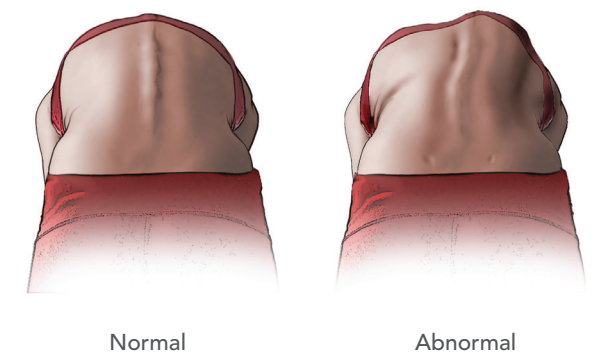- Lower back (lumbar) prominence on one side

Fifth position: Side, in a bending position (Adams Forward Bend Test)

Instructions to the child:

- Turn to the side. Put your feet together with weight equally on both legs.
- Put your palms together with arms out straight.
- Put your chin on your chest and roll down until your hands touch your feet.

Look for (see Figure 6):

- Normal c-shaped curve or more-than-normal roundness (kyphosis)

Note: Encourage the child to continue to roll down as far as possible until her back is parallel to the floor. Have the child repeat the Adams Forward Bend Test if she rolls down too quickly or if she rolls down to one side or the other. The child's hands should be pointing at her big toes.

Figure 4
Normal   Abnormal

Figure 5
Normal   Abnormal

Figure 6
Normal   Abnormal
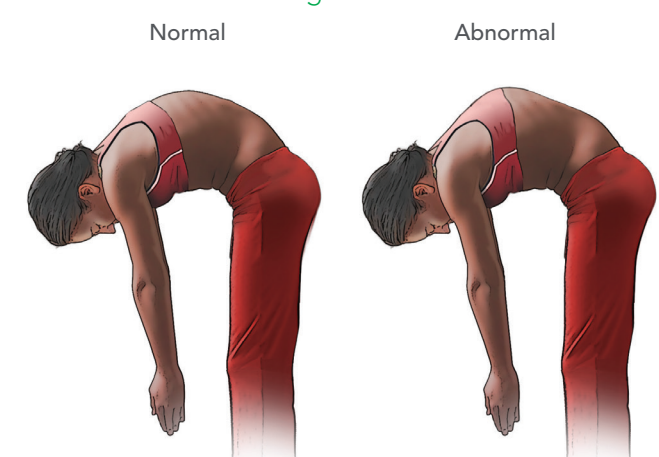
Your job is important

- Children are screened twice to validate screening results.
- Most children who are screened will test negative for scoliosis.
- Early detection is important.
- Screening is important prior to achieving skeletal maturity to avoid complications as an adult.
- Scoliosis can be a disfiguring and painful condition.
- Screening will minimize health problems later in life.

Documentation of screening results

Information about the screening results is not shared with children at the time of the screening. If children ask, tell them their parents or guardians will be notified if any follow-up is needed.

Using the form provided by the school

- Note whether screening is negative or refer for a second screening.
- Document the positive signs of scoliosis—usually a check mark noting difference on right or left side of body.
- Date the form if child has not noted the date.
- Print your name as the primary screener or secondary screener.
- Initial or sign the form if required.

The Children's Scoliosis Screening Program *coordinates referrals to an orthopedic physician at one of our 14 Children's Physician Group–Orthopaedics and Sports Medicine locations for a complete evaluation and X-rays.*

BEST CHILDREN'S HOSPITALS
U.S. News & WORLD REPORT
ORTHOPEDICS
2021-22

Georgia's only nationally ranked orthopedics program for kids and teens

- A complete exam
- Low-dose X-ray technology that allows us to cut radiation exposure by up to 50 percent compared to adult facilities
- Communication to primary care physician about follow-up care
- Recommendations for orthopedic follow-up care, including six-month and one-year exams
- Education and resources on treatment options

Parents can visit **choa.org/appointments** or call **404-255-1933** to make an appointment.

Visit **choa.org/scoliosis** to learn more.

Curve Checks
Video series quiz

Front view	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9
Shoulder elevation	L R	L R	L R	L R	L R	L R	L R	L R	L R
Unequal distance between arm and body	L R	L R	L R	L R	L R	L R	L R	L R	L R
Uneven hips	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Rib prominence	L R	L R	L R	L R	L R	L R	L R	L R	L R
Lumbar prominence	L R	L R	L R	L R	L R	L R	L R	L R	L R
Back view									
Shoulder elevation	L R	L R	L R	L R	L R	L R	L R	L R	L R
Shoulder blade elevation or prominence	L R	L R	L R	L R	L R	L R	L R	L R	L R
Waist fold difference	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Unequal distance between arm and body	L R	L R	L R	L R	L R	L R	L R	L R	L R
Rib prominence	L R	L R	L R	L R	L R	L R	L R	L R	L R
Lumbar prominence	L R	L R	L R	L R	L R	L R	L R	L R	L R
Side view									
More-than-normal back roundness	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N

Curve Checks
Video series answer key

Correct answers are circled in red ◯

Front view	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9
Shoulder elevation	L R	L (R)	L R	L R	L R	(L) R	L R	L R	L R
Unequal distance between arm and body	L R	(L) R	(L) R	L (R)	L (R)	(L) R	(L) R	L R	L R
Uneven hips	Y N	Y N	Y N	(Y) N	Y N	Y N	Y N	Y N	Y N
Rib prominence	L R	L (R)	L R	L R	L R	(L) R	L (R)	L (R)	L R
Lumbar prominence	L R	L R	(L) R	(L) R	(L) R	L R	L R	L R	L (R)
Back view									
Shoulder elevation	L R	L (R)	L R	(L) R	(L) R	(L) R	(L) R	L R	L R
Shoulder blade elevation or prominence	L R	L (R)	L R	L (R)	(L) R	(L) R	L R	L (R)	L R
Waist fold difference	Y N	Y N	Y N	(Y) N	(Y) N	(Y) N	(Y) N	Y N	(Y) N
Unequal distance between arm and body	L R	(L) R	(L) R	L (R)	L (R)	L (R)	(L) R	L R	L R
Rib prominence	L R	L (R)	L (R)	L (R)	(L) R	L (R)	L R	L (R)	L R
Lumbar prominence	L R	L R	(L) R	(L) R	(L) R	L R	L R	L R	L (R)
Side view									
More-than-normal back roundness	(Y) N	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)

Notes

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