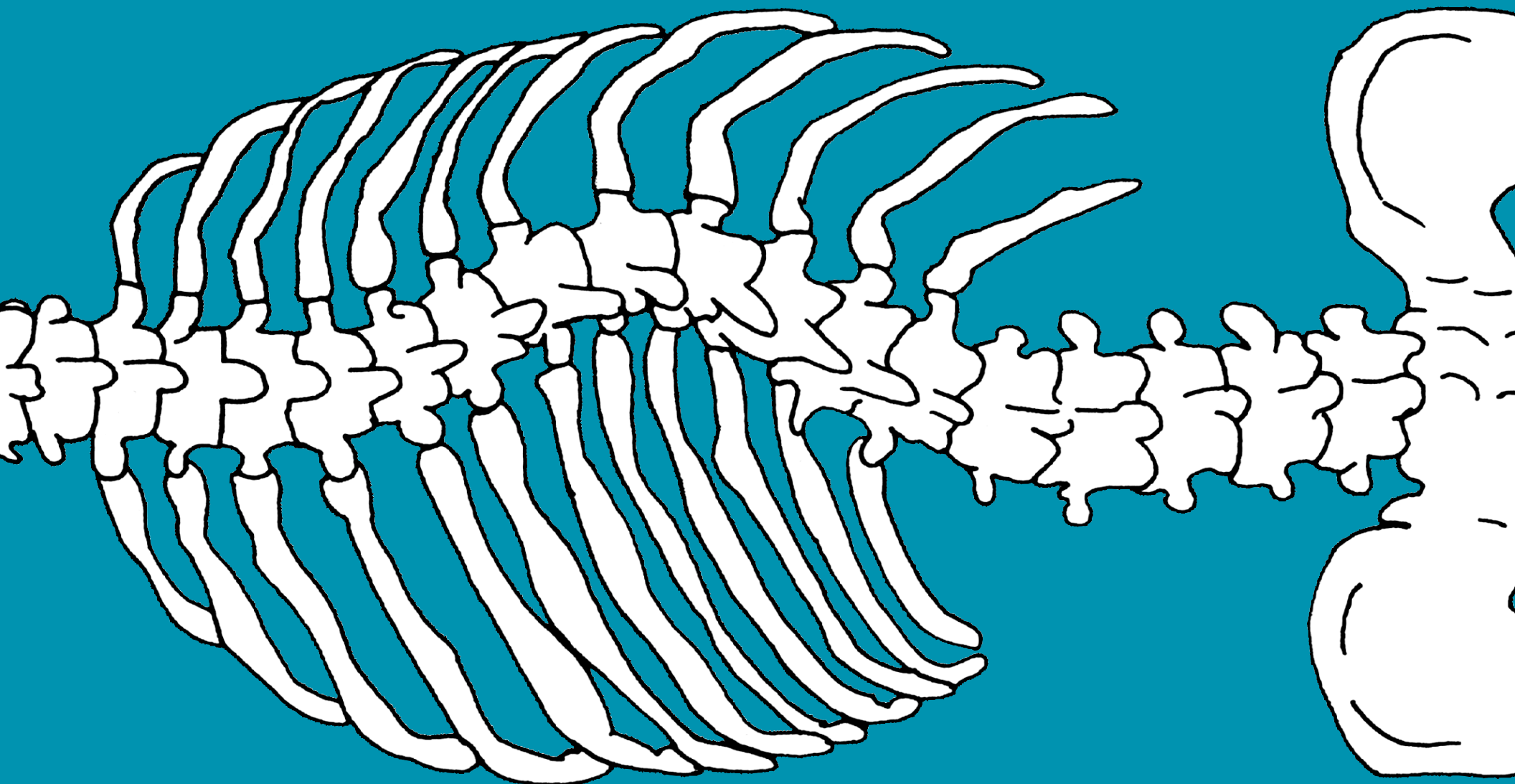
Scoliosis Screening / A Manual

Prepared by
Gillette Children's Specialty Healthcare and
the Minnesota Department of Health
in conjunction with the Twin Cities Spine Center



SCHOOL SCREENING FOR SCOLIOSIS

A Program Manual

Prepared by:
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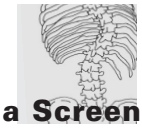
The Importance of Scoliosis Screening

Scoliosis is a medical term that describes a lateral (sideways) curve of the spine. Two to 5 percent of children between the ages of 10 and 15 — the growth-spurt years — have these curves. The incidence of scoliosis is equal in boys and girls. Progressive scoliosis — the most severe type — is more common in girls.

Although many curves are minor, progressive scoliosis can lead to disabling spine deformities. To prevent such complications, scoliosis must be detected early. Treatment may then include observation (for mild curves) or bracing (for moderate curves). Bracing can prevent curves from progressing and may eliminate the need for surgery.

Parents are unlikely to detect curves at an early stage. In addition, many children ages 10 to 15 don't see a primary-care provider routinely. For those reasons, the Minnesota Department of Health (MDH) encourages school districts — in collaboration with local primary-care providers — to screen for scoliosis.

MDH recommends screening girls in fifth grade and again in eighth grade. Boys should be screened in eighth or ninth grade.



Setting Up a Screening Program

Gillette Children's Specialty Healthcare, the MDH Division of Family Health, Shriners Hospital for Children/Twin Cities and the Twin Cities Spine Center developed and provide ongoing guidance, as necessary, for the Minnesota scoliosis screening program in schools.

Step 1: Planning

Administration

The school nurse or health coordinator in charge of the scoliosis-screening program should discuss its importance with the school administrator and other appropriate school personnel. Together, they should plan to integrate scoliosis screening into the school's overall health program.

MDH encourages collaboration with the local health-care providers who'll receive referrals from the screening program. You may want to discuss screening procedures with them and solicit support for the program.

Staff Orientation

All screeners — school nurses, physical-education and other teachers, volunteers, doctors, nurse practitioners and anyone else involved in the screening program — should attend the Scoliosis Screening Seminar. It's held once a year in the Twin Cities.

The seminar generally includes:

- Presentations by specialists
- Videos and slides
- Demonstrations of the forward-bending test, the scoliometer (a device that measures spinal curves) and other techniques of the screening process
- Discussions of program planning and referral sources

The school nurse, health coordinator and screener(s) should familiarize themselves with this manual, *Scoliosis Screening /A Manual*. It includes a letter to parents about screening and a referral letter for students who need an additional medical examination. (See appendices A and B.)

The MDH library offers free copies of *The Straight Facts of Scoliosis Screening* booklets. Gillette Children's Specialty Healthcare lends and sells related videos. (See appendix C.)

Scheduling

The school nurse or health coordinator should schedule screening times. Screening during physical-education classes often works well, because numerous students are available during a relatively short time.

Fall and early winter are the best times for screening programs. That allows adequate time to follow up with students referred for further medical exams. Be sure to consider test schedules, field trips and other school activities that could conflict with the screening. When dates are set, inform parents of the impending screening (see appendix A for sample letter).

Student Orientation

Before the screening, we recommend that students discuss scoliosis and observe a demonstration of the screening process. Such activities minimize apprehension of screening and increase students' knowledge of their health.

Set-Up

The screening area must be large enough for screeners, students being screened and students waiting to be screened. Make sure the area has adequate lighting.

Gymnasiums, locker rooms, large nurse's offices and empty classrooms are common sites. We recommend using room dividers to give maximum privacy. Boys and girls are generally most comfortable when screened separately.

If walls in the screening rooms are white or yellow, set up a bright, solid-colored backdrop to make observation easier. Tagboard works well.

Step 2: Performing the Screening

Overview

A screening inspection has two parts. First, the child bends forward for a 30-second visual inspection. Next, examiners measure any asymmetry using a scoliometer.

Identifying Students for Screening

Use class rosters to identify students and record results. Students who have scoliosis, but who haven't been treated with braces or surgery, should be screened.

What Students Should Wear

Because clothing can hide subtle signs of scoliosis, it's best to screen students when their backs are bare. Girls may be more comfortable wearing a bra or swimsuit. Boys may wear shorts or swim trunks. Let students know in advance to bring such items.

Children unwilling to be screened with a bare back may wear a plain colored T-shirt. For best results, however, minimal clothing is recommended.

Performing the Screening

Students stand erect, with their feet two to three inches apart and their backs toward the screener. (See appendix G for examples.) The screener then observes each student's back, looking for abnormalities such as:

- An obvious curve
- Shoulders unequal in height
- One protruding shoulder blade
- An uneven waistline
- Uneven hips
- An unequal distance between the arms and body when the arms are hanging straight down at the sides

Although these aren't diagnostic signs, they may indicate a problem.

With their backs to the screener, students then bend forward 90 degrees at the waist, with their knees straight, arms hanging and palms slightly together. Their feet should be two to three inches apart, and their heads should be down.

The screener then compares both sides of the back's lumbar and thoracic areas. Both sides should be symmetrical. Any asymmetry — whether barely noticeable, minor or obvious — indicates a positive finding.

We recommend using a scoliometer to make screening easier and referral decisions more accurate.

Step 3: Referrals and Monitoring

Whom to Refer

Make a referral to a primary-care physician if students:

- Exhibit unequal lumbar or thoracic areas of 7 degrees or greater (as measured by a scoliometer)
- Have an excessively inverted lower back (lordosis)
- Have an excessively round back (kyphosis)
- Show any other obvious abnormality

Requesting a Referral

When referring a student for further evaluation with a primary-care physician, the school nurse or screener should give parents a letter to take to the physician. After examining the child and confirming the asymmetry, the physician should take an X-ray to confirm the diagnosis of scoliosis and refer cases of scoliosis to an orthopaedic specialist for evaluation. An X-ray helps establish a baseline against which to measure a curve's subsequent progression.

The primary physician may send the X-ray to the orthopaedic specialist for review. A brief history with the child's age, gender, stage of sexual maturation, neuromuscular disease (if any), evidence of pain, family history and other pertinent considerations should also be included with the child's medical information.

Depending on the severity of the curve, primary-care physicians or orthopaedic specialists provide follow-up treatment.

Make a "Watch" List
Make a list of students who have lumbar or thoracic discrepancies of 5 to 6 degrees or other questionable findings. Rescreen those students within three months.

Notify Parents
Contact parents of students who meet the criteria for referrals or monitoring. Discuss the screening results and emphasize the importance of further medical evaluation. It's essential for parents and students to understand that the student's condition may require treatment.

Emphasize that the screening identifies only a possible spinal problem (it's possible to have an asymmetrical back with a straight spine). Screenings are **not** a diagnostic service. Be prepared to discuss fears and answer questions about scoliosis.

Suggest that parents schedule a medical evaluation with the child's primary-care physician, and mail parents a referral form (see appendix B for a sample). Ask parents to return the form to the school after the medical evaluation.

Note all findings on the student's school health record, including the date of the screening and the name of the health-care provider to whom the referral was made. Record results of the subsequent medical evaluation.

Monitoring Students
Whenever possible, follow up if students don't return their referral letters to the school. Sometimes, families don't understand the importance of an evaluation.

We encourage schools to keep track of students who are diagnosed with scoliosis. Classroom and scheduling adaptations may be needed to accommodate the prescribed scoliosis treatment (such as braces). Schools should also follow up with students who have scoliosis to make sure they're seeing a primary-care provider regularly.

Keeping Statistics
MDH no longer maintains a scoliosis database. Schools are encouraged, however, to collect data about the prevalence of scoliosis in their communities. They may want to use the *School Scoliosis Screening Report* (see appendix E).

Because scoliosis screening is voluntary, MDH doesn't need the data. Instead, include it in your annual report to school administrators about your school's health programs.

Appendix A: Letter to Parents Regarding Screening

Dear Parents:

In the next few weeks, we'll conduct a screening program to identify children who may have an abnormal curve of the spine (scoliosis). Studies estimate that two to five of every 100 children develop scoliosis, and some require treatment. Early detection and treatment help prevent or minimize the development of severe spinal deformities.

The screening procedure is simple. It consists of a 30-second test in which the screener — usually a school nurse or physical-education teacher — looks at a child's bare back while the child is standing and bending forward. We'll make every effort to ensure your child's privacy. Girls can wear a swimsuit and boys can wear swim trunks during the screening.

If your child appears to have a spinal curve, we'll notify you. Then we'll ask you to make an appointment with your primary health-care provider for further evaluation of your child's condition.

Please complete the form below, noting whether or not you'd like your child to participate in the screening program. Detach the form and return it to the school.

Sincerely,

_____ _____

School Nurse Phone Number

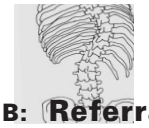
Detach here and return this form to your child's school.

☐ I do not wish to have my child, _____, screened for scoliosis.

Name

_____

Parent Signature



Appendix B: Referral Letter

Dear Parents:

Your child, _____, recently participated in our school scoliosis screening program.

Although this screening program is not a diagnostic service, screening results indicate that your child needs further evaluation to determine whether he or she has a spinal deformity and, if so, what treatment may be necessary. We strongly recommend that you take your child to your primary health-care provider for further evaluation.

Scoliosis is a side-to-side curvature of the spine that can cause complications if left untreated. Although the cause is unknown, the condition becomes more apparent during the adolescent growth spurt. If detected early, scoliosis can be treated.

Please ask your child's physician to complete this form after your child's evaluation. Sign the form and return it to the school health office.

If you have additional questions, please don't hesitate to call me.

Sincerely,

_____ _____

School Nurse Phone Number

Physician's Findings and Recommendations

I have examined _____ on _____.

Child's Name Date

Standing (posterior-anterior) X-ray shows:

- ☐ No significant findings at this time
- ☐ Needs further evaluation
- ☐ Re-examination recommended in _____ months
- ☐ Treatment recommended

Additional comments: _____

_____

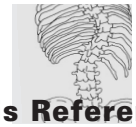
_____

Physician Name (print) _____

Physician Signature _____

Clinic Name _____ Phone Number _____

Parent Signature _____



Appendix C: Scoliosis References and Resources

Books, Pamphlets and Newsletters

Conservative Treatment of the Scoliotic and Kyphotic Patient
Archives of Pediatric Adolescent Medicine, 148, 646-651
McLain, R.F., Karol, L. (1994)

Managing School Screening Referrals
Journal of Musculoskeletal Medicine, July 1989, Pages 37-54, Lonstein, J.E.

One in Every 10 Persons Has Scoliosis
A pamphlet illustrating what scoliosis is and how screenings work.
National Scoliosis Foundation
5 Cabot Place
Stoughton, MA 02072
781-341-6333
Cost: No charge for first copy; additional copies are 12¢/each.

Postural Screening: Guidelines for School Nurses
National Association for School Nurses
163 U.S. Route 1
P.O. Box 1300
Scarborough, ME 04070-1300
1-877-627-6476
Cost: No charge

School Screening for the Early Detection of Spine Deformities: Progress and Pitfalls
Minnesota Medicine, 59, 51-7.
Lonstein, J.E., Winter, R.B., Moe, J.H., Bianco, A.J., Campbell, R.G., Norval, M.A.

Screening School Children for Scoliosis
Clinical Orthopaedics and Related Research, 229, 26-33
Renshaw, T.S. (1988)

The Spinal Connection Newsletter
National Scoliosis Foundation
5 Cabot Place
Stoughton, MA 02072
781-341-6333
Cost: No charge

The Milwaukee Brace for the Treatment of Adolescent Idiopathic Scoliosis
Journal of Bone and Joint Surgery, 76-A, 1207-1221
Lonstein, J.E., Winter, R.B. (1994)

The Spine: Juvenile and Adolescent Scoliosis
Third Edition, Volume 1, Chapter 14, pages 273-423
Authors: Robert Winter, M.D., and John Lonstein, M.D.
Check your local library for this publication.

Stopping Scoliosis
A book on scoliosis and treatment.
National Scoliosis Foundation
5 Cabot Place
Stoughton, MA 02072
781-341-6333
Cost: $14.95 plus shipping and handling

The Straight Facts of Scoliosis Screening
Minnesota Department of Health Library
717 Delaware Street S.E.
P.O. Box 9441
Minneapolis, MN 55440
612-676-5274
Cost: No charge

Screening Tool

Scoliometer: A Tool for Measuring Spinal Curvature
National Scoliosis Foundation
781-341-6333
Cost: $40 plus shipping and handling
(See page 14 for ordering information.)

Videos

Brace Yourself for the Future: Bracing for Scoliosis
Suitable for students and school staff
Length: 12 minutes, 50 seconds
Gillette Children's Specialty Healthcare
Spine Program Manager
200 University Ave. E.
St. Paul, MN 55101
651-229-1764
This video is available for loan or purchase.
Cost to purchase: $19.95

Scoliosis Screening for Early Detection
Length: 14 minutes, 15 seconds
Describes the screening process for scoliosis and stresses the importance of early detection.
Gillette Children's Specialty Healthcare
Spine Program Manager
200 University Ave. E.
St. Paul, MN 55101
651-229-1764
This video is available for loan or purchase.
Cost to purchase: $14.95

Scoliosis Screening, Student Video
Length: 6 minutes, 20 seconds
This video explains the scoliosis screening process from students' perspectives.
Gillette Children's Specialty Healthcare
Spine Program Manager
200 University Ave. E.
St. Paul, MN 55101
651-229-1764
This video is available for loan or purchase.
Cost to purchase: $5.95

Web Sites

National Scoliosis Foundation:
http://www.scoliosis.org

Scoliosis Research Society:
http://www.srs.org

Scoliosis World:
http://www.scoliosis-world.com

American Academy of Orthopaedic Surgeons:
http://www.aaos.org

Appendix D: Questions and Answers About Scoliosis

Q. What percentage of people have scoliosis?

A. Idiopathic scoliosis (scoliosis with an unknown etiology) causes:
- Curves of 10 degrees or greater in 2 to 3 percent of people
- Curves of 20 degrees or greater in 0.5 percent of people
- Curves of greater than 30 degrees in 0.2 percent of people

Q. Can poor posture cause scoliosis?

A. Poor posture doesn't cause scoliosis or affect the way a curve progresses.

Q. Does exercise prevent mild scoliosis from getting worse?

A. No. There's no evidence that physical exercise affects curves or prevents curves from progressing.

Q. What signs indicate that a curve is progressing?

A. The most accurate sign is when standing X-rays taken three to six months apart show an increasing curve. It's almost impossible to note such a progression just by examining the back.

Q. Why should schools screen for scoliosis?

A. Scoliosis is most likely to be identified early when schools screen for it. Scoliosis may otherwise go undetected because:
- Students are unlikely to receive physical exams at this age unless they have a health problem.
- Scoliosis is essentially painless, producing no symptoms other than an abnormal curve in the back.
- Idiopathic scoliosis most often develops during preadolescence or early adolescence, when modesty may preclude parents from seeing their children unclothed.
- Long hair and loose clothing styles can conceal significant deformities.

Q. How can schools make screenings more accurate and prevent over-referring for questionable spinal deformities?

A. For new programs, the most efficient way to obtain screenings that correlate with clinical results is to have help.

Invite someone who has helped with other screenings and who's experienced in visual screenings and using a scoliometer. An experienced person can help establish criteria for normal and abnormal curves. Experienced screeners, such as nurses who attend the Scoliosis Screening Seminar, are excellent resources. Using a scoliometer also promotes more accurate assessments and referrals.

Q. Do curves progress after the spine stops growing?

A. After the spine stops growing (at about age 17 in girls and age 19 or 20 in boys), usually only moderate or severe curves progress. That's why it's important to detect the curves early and prevent them from increasing.

Q. If someone has scoliosis, is it important to evaluate family members?

A. Yes. Heredity may be a factor in the most common type of scoliosis (idiopathic). Therefore, all brothers and sisters of a child diagnosed with scoliosis should also be evaluated.

Q. Is one sign of scoliosis more significant than others?

A. The most significant sign of possible scoliosis appears when a person bends forward and the screener sees that the two sides of the back's thoracic or lumbar areas are uneven.

Q. If a doctor says a child is all right, should any follow-up be done?

A. If children have questionable findings, the school nurse or other designated screener should check them again in three to six months. If there's a marked change at that time, refer the child to the primary-care provider for further assessment.

Q. Is there any way to prevent scoliosis?

A. There's no known way to prevent scoliosis from developing. The best ways to prevent scoliosis from becoming a severe problem are by early detection and prompt treatment. Treatment may include observation for mild curves, bracing for moderate curves, and surgery for severe curves.

Q. Can a difference in leg lengths mimic scoliosis?

A. If children have legs of different lengths, a variance in the sides of the back (particularly in the lumbar region) often appears when they bend forward. A scoliometer can measure the degree of variance in the lumbar or thoracic area. Refer students whose unevenness measures 7 degrees or greater for further medical evaluation.

Q. Can overuse of one side of the body cause scoliosis (e.g., carrying a backpack over one shoulder)?

A. No. Overuse of one arm or leg will not cause scoliosis.

Q. What is kyphosis?

A. Kyphosis ("roundback" or "hunchback") is an abnormally convex curve in the thoracic area of the spine. In most instances, it's caused by poor posture. It also can be caused by Scheuermann's disease. Children with excessive kyphosis should see a primary-care provider for further evaluation.

Q. What is lordosis?

A. Lordosis ("swayback") is an increased concave curve in the lumbar and cervical areas of the spine. In adolescence, it's usually caused by poor posture.

Q. Some children with disabilities can't bend forward. How do we screen those children for scoliosis?

A. Such children may need help undressing or bending forward. They may need to sit on a tabletop, with their legs swinging free and apart. Although screening children who have disabilities requires patience and additional time, it's critical to do so. The incidence of scoliosis requiring treatment is higher among children who have disabilities than it is in others.

Directions for completing scoliosis screening report form. Do not submit to MDH.

SECTION A:

1. Screening results this screening:

a) Column 1 reflects total number of students enrolled in your building.

b) Column 2 reflects total number of students screened by grade and gender.

c) Column 3 is for students with questionable findings at this screening who have **NOT** been referred to a physician.

d) Column 4 is for students referred for medical follow-up as a result of this year's screening.

SECTION B:

2. Referral results this screening:

a) Columns 5-12 are for recording the findings of referrals to an examining physician.

b) Column 8 reflects students referred, but for whom an examining physician has not forwarded a report or the parents haven't completed the follow-up instructions.

c) Columns 9-11 report medical treatment **only** for those students diagnosed with scoliosis.

d) Column 12 reflects students seen by a physician and diagnosed as having scoliosis, but for whom you don't know the recommended treatment.

3. The totals of columns 5, 6, 7 and 8 should equal the total in column 4.
The totals of columns 9, 10, 11 and 12 should equal the total in column 5.

FOR INTERNAL USE ONLY
DO NOT SUBMIT TO MDH

SCHOOL SCOLIOSIS SCREENING REPORT

School Name	
School District Name	District Number
County	City

A. SCREENING RESULTS THIS SCREENING					B. REFERRAL RESULTS THIS SCREENING							
	1	2	3	4	5	6	7	8	9	10	11	12
Grade M=Male F=Female	Total No. Enrolled	Screened	Findings Not Referred	Findings Referred	Results of Referrals for Professional Examination							
					Diagnosis				Recommended Scoliosis Treatment			
					Scoliosis	Normal	Other	Follow-up Incomplete	Observa-tion	Bracing/ Other	Surgery	None/ Unknown
5F												
6F												
7F												
8M												
9M												
10M												
TOTAL	Total No.	No. of Questionable	No. of Positive									

Name of Person Completing This Report
Title of Person Completing This Report
School Year of This Report

Appendix F: Screening Device

National Scoliosis Foundation

More than 25 years of service to the community

OSI Scoliometer Screening Device

Provides objective guidelines for referral and reveals small curvatures that don't require referral, but do need watching. Screening is carried out in the standard fashion. $40 each, plus shipping and handling. (See our Web site for shipping fees.)

Features and Benefits of the Scoliometer:

- Accurate
- Convenient and easy to use
- Extensively researched and clinically tested
- Improves, but doesn't change, current screening practices
- Affordable
- Helps in reducing over-referrals

Please send _____ scoliometer(s) at $40 each for a total of $ _____ .
Quantity

Be sure to include payment or a purchase order.

Name: _____

Organization: _____

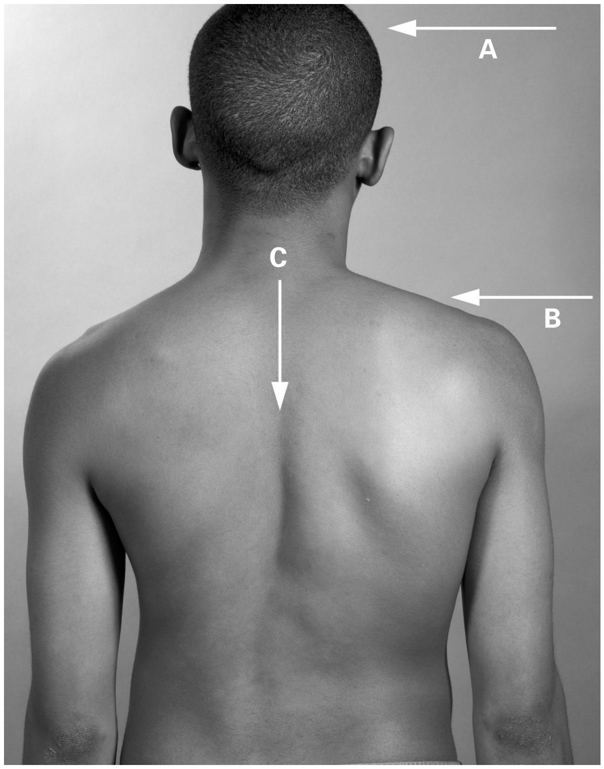
Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Fax: _____

Mail form to:
National Scoliosis Foundation
5 Cabot Place
Stoughton, MA 02072

781-341-6333 / Fax: 617-341-8333
www.scoliosis.org

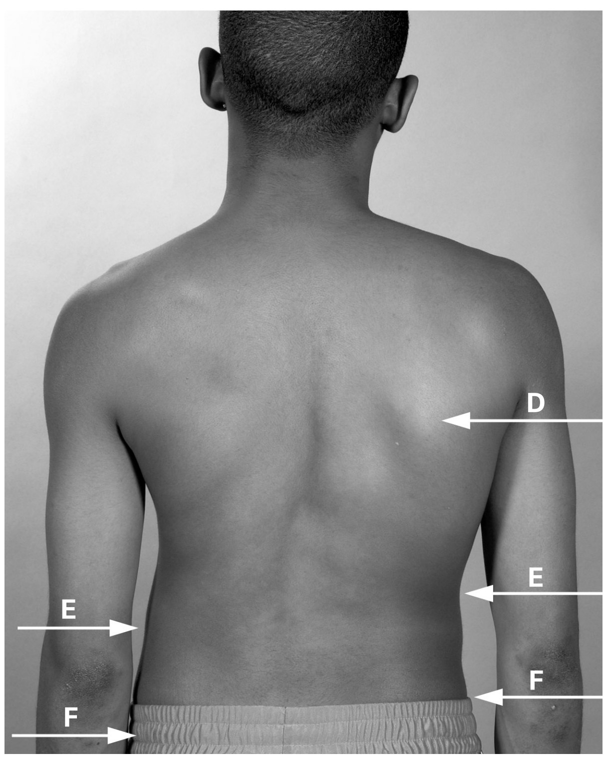


The person in this photo has idiopathic scoliosis. Follow these steps when checking for scoliosis.

A. Check if head is centered.

B. Check for equal shoulder height.

C. Check for obvious spinal curve.



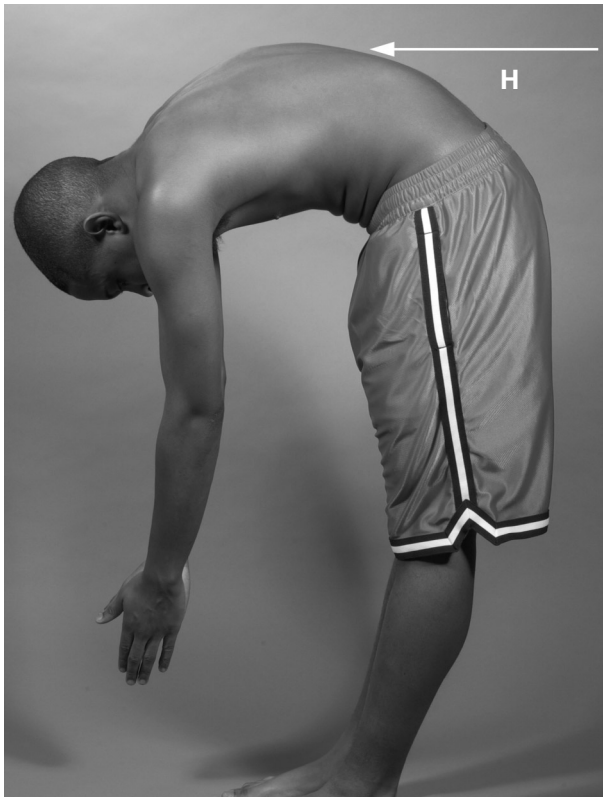
D. Check for protruding scapula.

E. Check for uneven waistline.

F. Check for uneven hips.

G. Check for asymmetry of the back. Photos G and H illustrate the correct stance for students undergoing scoliosis screenings.

H. Check for possible kyphosis.



Using a Scoliometer

A. The scoliometer measures rotational spinal curves.

B. Note the positioning of the scoliometer (both photos).

Braces Used to Treat Scoliosis

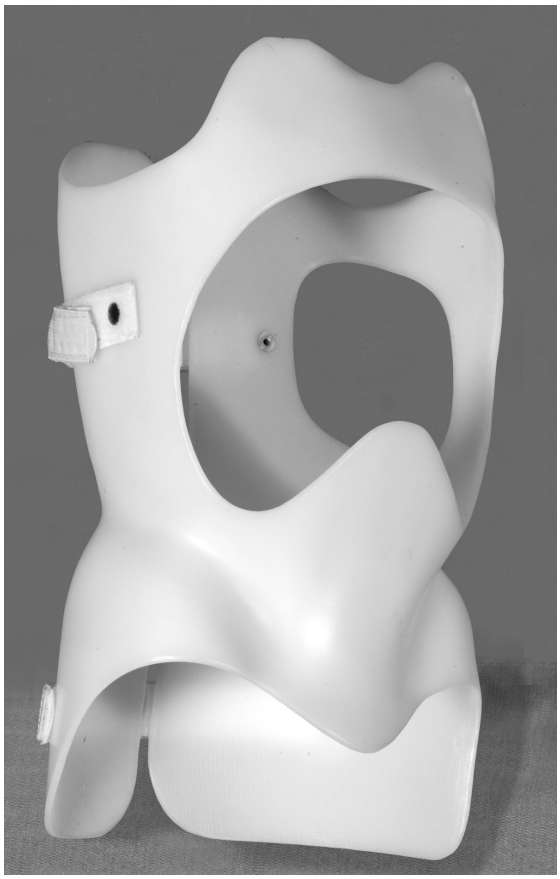


Figure A: Thoraco-Lumbar-Sacral Orthosis (TLSO).

Figure B: Cervical-Thoraco-Lumbar-Sacral Orthosis (CTLSO). This orthosis is also called a Milwaukee brace.

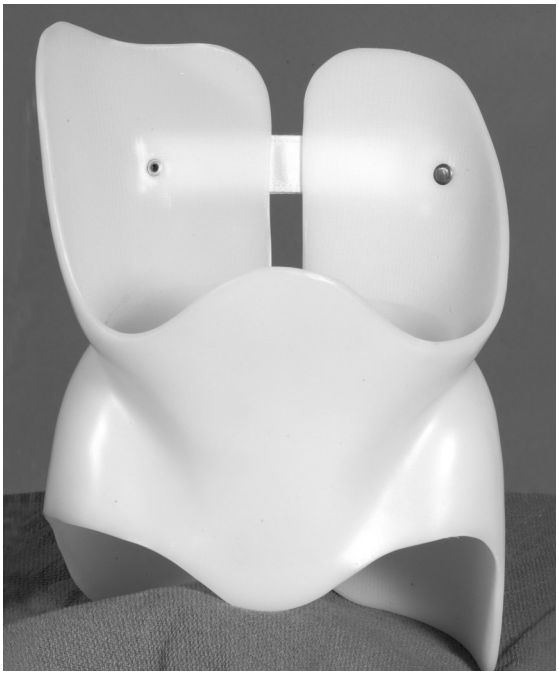


Figure C: One-piece, low-profile Thoraco-Lumbar-Sacral Orthosis (TLSO).