

## **Introduction**

School spinal screening was developed to identify adolescents with small spinal curves and refer them for treatment before these curves become too severe. All states do some form of spinal screening to assure students needing evaluation and/or treatment get early attention. The state of Utah mandates spinal screening for students using school nurses and other trained adults to screen all students. Best practices suggest that students be screened during the growth of adolescence, between the ages of 10 and 14 years. Careful training and understanding of spinal screening is essential for the success of this program.

A special thanks to the Scoliosis Research Society and to the Texas State Department of Health Services.

**School Spinal Screening Guidelines**  
**Utah School Nurses Association** **Fall Conference 2009**

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**Shriners Hospitals  
for Children™**

**Salt Lake City**  
Pediatric Specialty Care  
Orthopaedics

September 1, 2009  
Re: Scoliosis Screening

Dear Spinal Screener:

The surgical treatment of severe spinal deformities has been extremely successful. Continuing advances have made with more impressive results and easier procedures for the patients and their families. However, many of these surgeries may be prevented with effective school screening and intervention.

The majority of severe spinal deformities occur in children with adolescent idiopathic scoliosis. All of these children had little or no deformity in their preadolescent years. The goal of school screening for scoliosis has not changed during the 30 years it has been in existence, "to identify small progressive curvatures of the spine." All large devastating adolescent idiopathic curves were once small curves, the majority of which could have been braced.

Successful school screening programs and bracing programs result in a decreasing incidence of surgical intervention for the treatment of spinal deformity from adolescent idiopathic scoliosis. Despite the challenges of its efficacy, school spinal screening remains the standard. The role of the screener is to detect scoliosis early in an effort to prevent future spinal deformity.

My personal enthusiasm for school screening for scoliosis has remained unchanged over the last 30 years.

A handwritten signature in cursive script, reading "Jacques D'Astous".

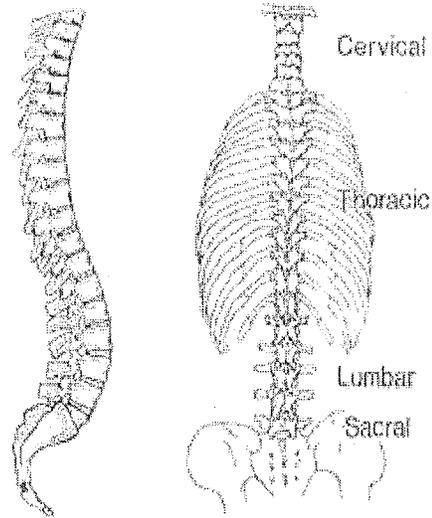
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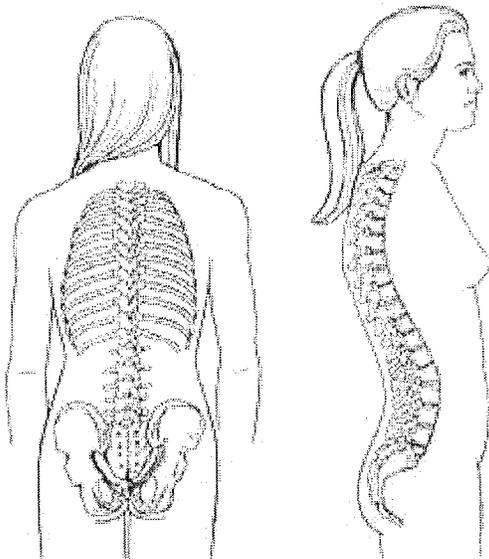
## The Normal Spine

The spinal column is made up of 33 vertebrae or body segments. These are aligned vertically on top of one another and supported by muscles and ligaments (Figure 1). Discs between each vertebrae serve as pads. The purpose of the spinal column is to provide stability, add mobility to the torso, and protect the delicate nerves of the spinal cord.



(Figure 1)

The spine is divided into four main areas: The cervical area (neck), the thoracic area (chest), and the lumbar area (small of the back), and the sacral area (lower portion of the spine). When viewing the back directly from behind the spine is straight, the shoulders even, hips are level and the distance between the arms and the body are equal (Figure 2).



When viewing the spine from the side, the natural curves of the shoulder and back can be seen. The shoulder blades protrude the same amount on each side, creating a symmetric appearance on each side of the spine.

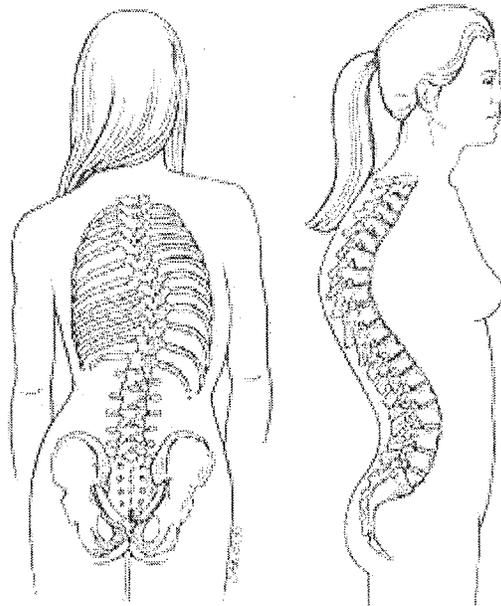
(Figure 2)

## Abnormal Spine Curvature

Spinal screening is designed to detect two major types of spinal deformities: scoliosis and kyphosis.

### Scoliosis

Scoliosis is defined as an abnormal lateral curvature of the spine of 10 degrees or more. This rotation in the spinal column creates a side to side, S shaped curve when viewed from behind (Figure 3). Some cases worsen with time and can result in serious problems such as unsightly appearance, occasionally back pain as one ages, and in the worst cases, interference with heart and lung



(Figure 3)

function. Scoliosis is further divided into two categories: structural and functional.

### Structural Scoliosis

These curves are the result of changes in the alignment in the vertebrae that are fixed. Structural curves can be distinguished from functional curves by their associated spinal twisting. This twisting results in the hump on one side of the rib cage seen when the student bends forward. Unlike poor posture, these curves cannot be corrected by learning to stand up straight.

### Functional Scoliosis

In this type of scoliosis there are no permanent changes in the shape or structure of the spine. Functional scoliosis develops secondary to another abnormality, usually in

the hip or lower extremity. The most common cause of functional scoliosis is a difference in the length of a student's legs that makes the child stand unevenly. Uneven leg length can be identified by having the student stand with one foot on a block of wood. With the hips then at the same level, the spine appears straight. Other causes are muscle spasms, pain, or poor posture.

### **Incidence of Scoliosis**

Eighty-five percent of all cases of structural scoliosis have no known cause and are referred to as idiopathic scoliosis. Idiopathic scoliosis occurs in two to three percent of the adolescent population. It commonly affects young people between the ages of 10 and 16 years of age. Gender does make a difference in the time of onset because girls begin their adolescent growth spurt and reach skeletal maturity earlier than boys. This accelerated spinal growth generally occurs from the ages of 10 to 14 for girls and 12 to 16 for boys. The incidence of idiopathic scoliosis occurs equally in early adolescence for both boys and girls for small curves (less than 10 degrees). Curve progression is more common in girls and larger curves are more prevalent. Another factor that can contribute to the incidence of scoliosis in a student is a positive family history of scoliosis, suggesting a genetic predisposition.

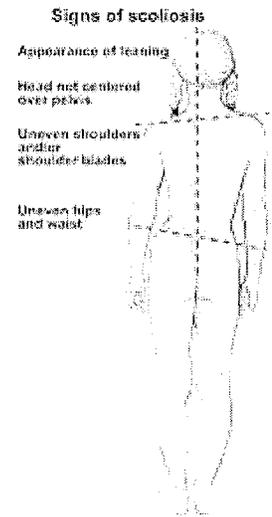
In contrast to idiopathic scoliosis, there are several less common types of scoliosis that have a known cause. These curves may be present at birth or related to muscle disorders and are not the focus of school screening because they occur earlier in life.

For idiopathic scoliosis, the earlier in the growth spurt a curve is identified, the greater the risk the curve will worsen. For example, an immature, premenstrual girl has a

higher risk of progression than an adolescent female who has begun menses, or an adolescent boy who has developed signs of maturation such as axillary hair.

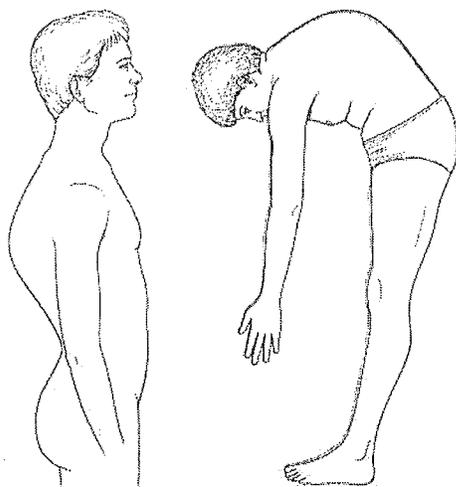
Idiopathic scoliosis can go unnoticed in a young person because it is rarely painful in the formative years. Signs to watch for are (see Figure 4):

- One shoulder higher than the other
- One shoulder blade higher/more prominent than other
- One hip higher than the other
- Space between arms and body greater on one side
- Leaning to one side
- The head is not centered directly above the pelvis



(Figure 4)

## Kyphosis



(Figure 5)

Kyphosis, or roundback, is described as an excessive curvature of the thoracic spine when viewed from the side (see Figure 5). This deformity can be corrected with exercises and proper posture if it is not fixed. A small percentage of young people have a fixed, structural type of curve called Scheureann's kyphosis, where the vertebrae are actually wedged. The cause for this type of deformity is unknown. Bracing or surgery

may be recommended for the immature adolescent with Scheuremann's kyphosis. In

relationship to scoliosis, a fixed kyphosis is a much rarer finding in teenagers, but will occasionally be identified during school spinal screening.

## **Spinal Screening Process**

Early detection is the key to controlling spinal deformities. The purpose of school screening is to detect scoliosis and kyphosis at an early age when the curve is mild and may even go unnoticed. Most curves can be treated without surgery if they are detected before they become too severe. The screening process identifies students that may have some physical findings that suggest a spinal curve. The screening process does not diagnose a spinal deformity. The student showing these findings is referred to a physician who completes an extensive examination and takes x-rays to confirm whether or not the student has an abnormal spinal curve. At that point, the physician can provide recommendations for treatment. The goal of the screening process is to detect a student who needs to be referred at the earliest point, before an abnormal curve gets worse.

## **Screening Procedure**

The examiner may conduct the screening from a seated or standing position. The examiner should place a mark on the floor to show the student where to stand. A distance of 5 to 8 feet between the examiner and student is recommended.

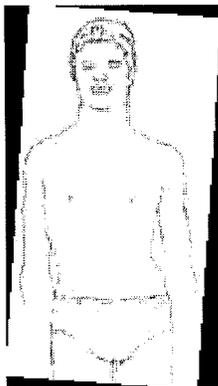
Students should remove their shirts so the screener has better visualization of the upper body. Girls should be wearing a bathing suit top or sport bra. If she is wearing a camisole, it should be rolled up so the examiner can visualize the upper back. Students should remove their shoes. They should ideally be wearing shorts as well, to allow better visualization of the waist, hips, and legs. Although the illustrations in this manual depict a student in his underwear, students should not be screened in their undergarments.

The student begins by standing erect with feet slightly apart, knees straight, and arms hanging loosely at his or her sides while facing the examiner. Note the following:

It is important for the student to face forward throughout the exam positions.

- Turning the head can cause a change in the findings.
- Long hair should be moved forward to allow full view of the student's back.

**1:** With the student facing front in the standing position (Figure 6), the examiner checks for the following signs of a possible abnormal spinal curvature:

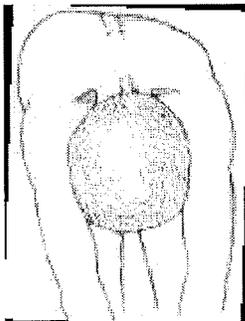


- One shoulder higher than the other
- Larger space from arm to the side of the body (compare both sides)
- Uneven waist creases
- Uneven hip levels

(Figure 6)

**2:** The next position is the Adams forward-bending test. The student is standing erect with feet slightly apart and knees straight. With the palms of both hands touching, the

student bends forward until the back is horizontal (Figure 7).

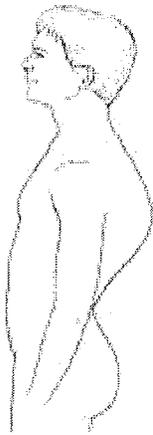


Examine the student in this position to check for:

- Uneven contours, humps on one side
- Any curve in the spine

(Figure 7)

**3:** View the student from the side in the standing position (Figure 8) and check for:

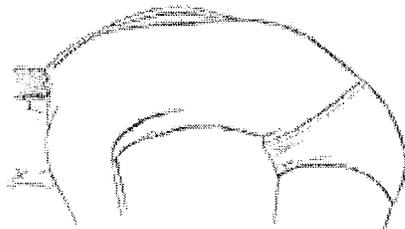


(Figure 8)

- Exaggerated roundness in upper back
- Exaggerated arch in lower back

**4:** Next, view the student from the side in the forward-bend position (Figure 9) checking

for:

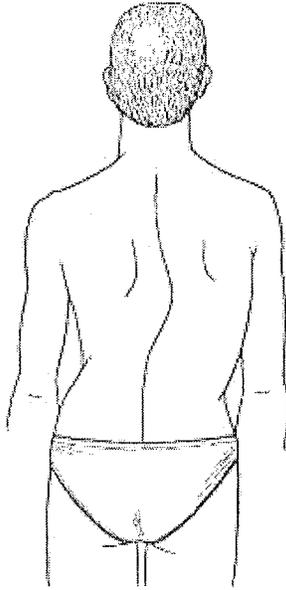


(Figure 9)

- Uneven contours, humps on one side
- Flexibility-can the student bend forward and touch upper shins or feet

**5:** View the student from the back in the standing position (Figure 10) and note any of the following:

- Head is not centered directly above crease in buttocks
- One shoulder blade wing is higher or stands out more than other
- One shoulder higher than the other
- Uneven waist creases
- Curved spine
- Uneven hip levels
- Larger space from arm to the side of the body (comparing both sides)

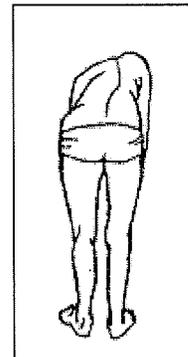


(Figure 10)

If hips appear uneven, but no other abnormalities are noted, consider possibility of unequal leg length, and visualize alignment of knee creases if possible.

**6:** Finally, view the student from the back in the forward-bending position (Figure 11) to check for:

- Uneven contours, humps on one side
- Any curve in the spine



(Figure 11)

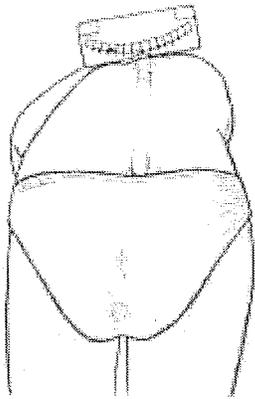
**Students with any positive findings should be re-screened prior to referral.**

## Using the Scoliometer

Scoliometer is best practice and should be used if at all possible. When some physical findings are present suggesting a spinal deformity, rescreening is necessary to identify which students need to be referred to a physician. The scoliometer is a brand of inclinometer. It is similar to a carpenter's level and designed to measure the degree of spinal rotation. This is particularly helpful when a student has some positive physical findings from the Adams forward-bending test. The purpose is to measure the degree of rotation to identify if the student needs to be referred to a physician for evaluation.

As with any tool, correct use is important to ensure the results are accurate and consistent. To use the scoliometer:

Place the scoliometer gently across the student's back at the point where a hump or unevenness is most prominent (Figure 12).



(Figure 12)

- The number "0" should be directly over the top ridge of the spine.
- Do not press down on the device as that can distort the reading.
- If there is asymmetry in the upper and lower back, 2 scoliometer readings will be necessary.

- Referral is recommended for students with a reading of 7 degrees or more at any level.
- Students with a reading of 5 to 7 degrees should be re-screened in six months to one year to determine if the curve is increasing.

## **Referral Process**

School screening was developed to identify adolescents with small spinal curves, and refer them for treatment before the curves become severe. Although the majority of patients with idiopathic scoliosis do not require more than observation, some will need brace therapy or even surgery. While school screeners can identify physical findings that may suggest spinal curves, they cannot diagnose the reason for the finding or its significance. This must be done by a physician.

The screening process is sensitive enough that some students will be referred that either do not have a spinal problem or do not require treatment beyond observation. The screener must be careful in communicating with the student and family when a problem is suspected until a final diagnosis is made. If there are concerns about a student's screening results, the screener is encouraged to work with another professional to review the findings. Novice screeners are encouraged to work with an experienced screener to gain expertise. A scoliometer may be particularly helpful for re-screening to measure the spinal curve and decide on the need for referral. All students with positive findings are to be re-screened prior to referral.

Proper documentation of the school spinal screening program includes:

- Results of initial screening
- Results of re-screening
- Referrals made
- Planned follow-up

The spinal screening worksheet (Appendix A) provides space to record all of the above.

A student found to have a possible abnormal spinal curve at the initial spinal screening and re-screening will be referred to a physician. The physician will evaluate whether or not there is truly a spinal deformity. A complete history and physical examination involves re-evaluating the findings noted during the school screening. An x-ray may be taken to allow the physician to see and measure any abnormal curvature of the spine. The most common measurement used is the Cobb method, which identifies the degree of curvature. The skeletal maturity of a young person can also be estimated by evaluating the Risser sign on the x-ray. This is a small ridge of bone that forms over the top of each side of the pelvis. The more complete the Risser sign, the more mature the skeleton and the less risk for any future growth that could increase the curve. Another way the physician may estimate bone/skeletal maturity is through a hand x-ray. This works because bones in the hand mature at different times during the child's growth spurt. The amount of curvature in degrees and the maturity of the skeleton at the time of discovery will determine the treatment selection.

## **Management Options**

Management options for spinal deformities consist of the three “O”s:

### **Observation**

Routine re-screening or observation by the physician is a form of treatment for mild curves. Once the school program refers a student to the physician as a result of a positive finding, the physician may need to follow the adolescent and monitor for any increase in the curve. From the amount of curve and the growth pattern of the child, the physician will decide if and when to add any further treatment. This observation period consists of a re-screening regularly throughout the rapid growth years of adolescence until the spine is mature. It is important to note that more than 90% of students with scoliosis require no treatment other than observation.

### **Orthosis (brace)**

Studies show that bracing can prevent the progression of a spinal curve in a growing adolescent (Rowe 1099, Lonstein 1994). This makes it important for students that have mild curves that are progressing to be identified. For a student with scoliosis, preventing the curve from progressing can prevent the need for spinal surgery (Rowe). While the orthosis can prevent worsening of the spinal curve, it cannot undo what curve already exists.

Bracing is generally recommended for curves of 25 to 40 degrees for the progression of existing curves in adolescents with growth remaining. Use of orthosis, often called a spinal brace, can prevent progression of the curve. The orthosis supports and puts pressure on the spine to prevent more curvature from forming during active spine growth. The main factor in achieving a higher rate of success is how many hours in

the day the brace is worn. This is a good reason to encourage students to wear their orthoses as prescribed by their doctor.

Various spinal orthoses are available. The TLSO orthosis (Illustration 1) is named by the areas it is designed to stabilize the thoracic, lumbar, and sacral parts of the spine. It is more cosmetically acceptable than the older Milwaukee brace because it can be covered well by clothing.

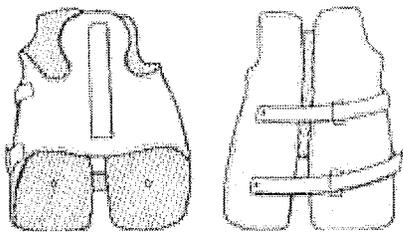


Illustration 1: TLSO Low Profile Orthosis

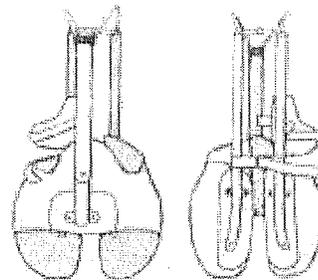


Illustration 2: Conventional Milwaukee Brace

In some cases the curve is high in the spine and will require a Milwaukee brace for correction (illustration 2). Wearing a brace is not an easy treatment for a teenager. Even covered by clothing, it is hot, hard, and can make the student feel self-conscious. Getting into a daily routine of wearing the brace and participating in activities the student enjoys helps with compliance, which is the key to successful treatment. Even though bracing can be difficult for adolescent to adjust to, studies have found this to be short-term for the teen with a supportive environment.

### **Operation: Spinal Fusion and Instrumentation**

For those students with worsening spinal deformity, surgery can reduce a portion of the curve and prevent it from increasing in the future. Usually surgery is reserved for teens and pre-teens that already have a curve of 45 degrees or more. The most common surgical procedure is a posterior spinal fusion with instrumentation and bone graft. This type of surgery involves attaching rods to the spinal column to help straighten it. The

bone graft between the affected vertebrae encourages fusion, or joining, of the bone to prevent further progression of the curve. Instrumentation refers to the various rods, hooks, wires and screws which are used to hold the spine in the corrected position while the bone fusion heals. The instrumentation is rarely removed.

Following the surgery, the fused section is no longer flexible. This does not seem to cause a problem unless there is a great number of vertebrae that need to be fused. The average hospital stay is about 5 to 7 days, and the student can usually return to school in 2 to 6 weeks. During the first year after surgery, there will be some limitation on strenuous physical activity. After this healing phase, the surgeon will usually release the student for all activities, including some competitive, low contact sports. Sometimes the physician feels it is necessary to exempt the child from competitive contact sports and gymnastics.

### **Alternative Treatments**

Other treatments have been tried for spinal deformities and have not been found to be successful in preventing curves from progressing. Included in this list are electrical muscle stimulation, exercise programs, manipulation, massage, and magnets. These treatments may not be harmful in and of themselves. The concern is that the use of, or belief in, these treatments prevents the family from seeking proven treatment. This delay in medical treatment may cause the adolescent with a progressing curve to get worse and need surgery instead of bracing.

## **Cost Effectiveness**

Early detection and initiation of treatment can prevent the need for spinal surgery at the cost of tens of thousands of dollars. Early treatment also prevents the discomfort, need for physical rehabilitation, and interruption in schedule related to major surgery. Surgery can result in a student missing from 2 to 6 weeks of school, and needing homebound instruction during the recovery time.

## **Frequency of Screening**

Ideally, spinal screening should be conducted annually during the growth of adolescence, ages 10-14 (grades 5 through 9), to detect spinal concerns early. A student should be screened at least twice between ages 10 and 14.

The program allows for screeners to re-check students they consider to be at risk for developing an abnormal curve. A sign of possible abnormal curvature (though not enough to warrant referral), along with evidence that a student is in a rapid growth phase, would be criteria for rescreening that student. In males, rapid growth may continue to the age of 16, which the screener may need to take into consideration for follow-up.

## **Who May Screen**

In accordance with Utah law (53A-11-202), registered nurses, teachers, and physicians may conduct school spinal screenings. Others may screen under the supervision and training of the school nurse.

Review the General Organization for Spinal Screening Activities on the following pages for a detailed outline of the screening process and documentation.

## **Establishment of a School Screening Program**

- Coordinate with school administration
- Determine screening date and site.
- Obtain necessary forms (most forms you will need are included in Appendix A).
- Conduct an in-service training for spinal screeners (see Resource Page for training tools).
  - Discuss the legal requirements for spinal screening, scope of the problem, rationale and technique of screening.
  - Discuss grades to be screened and methodology for screening including how follow-up of positive cases and referrals will be carried out.
- Verify and document volunteer competency prior to screening.
- Arrange and perform screening.
- Complete follow-up and referral activities.

## **General Organization for Screening**

(See also-School Spinal Screening Flowchart, Appendix B)

If for some physical condition a student cannot stand in the manner necessary for the Adam's forward-bend test, do not attempt to screen that student. The screener should contact the student's parents and inform them that their child is at the age where he/she should receive the state-mandated spinal screening. Ask the parents or legal guardian to request a medically appropriate spinal screening from the student's primary physician at his/her next visit, and request the results of this screening for the school's records. It may be helpful to provide the Parent Notification and Referral form to the parents for this purpose.

## Students Under Prior Treatment

If it has been verified that a student is receiving on-going treatment for scoliosis, kyphosis, or other spinal abnormality, then it is not necessary to screen that student. Record this student in the Under Prior Treatment column of the Spinal Screening Report. Do not record the student's diagnosis or treatment on the form. Those data are only for the students that have received a parent notification and referral from the school. If unable to verify a student is under prior treatment for a spinal abnormality, then include the student in the school spinal screening.

## Preparation for Screening

Students must be screened individually in a space offering privacy. If possible, locate a private area where students can remove their shirt and/or change clothing. A room adjacent to the physical education dressing room is often ideal for screening.

You may choose to have two or more adults participate in the screening process for security/liability concerns. Assistants can help with preparation and management.

Conduct orientation sessions for each class of students to be screened.

Determine the amount of time needed to conduct the screenings and develop a schedule. With an assistant, an experienced screener should be able to screen 20 to 30 students in an hour. If necessary, coordinate this schedule with the teachers who will need to release their students from class on those days.

Send out a pre-screening letter to the parents (see Sample Pre-screening Letter in Appendix A).

Have a roster of students available using the Spinal Screening Worksheet (Appendix A) or a similar form.

On the day before the screening, remind students of the screening's purpose. Remind boys and girls to wear or bring shorts, and remind girls to wear a swimsuit top, halter top, or sports bra.

## **Screening**

There should be a table nearby for use in writing down information, and a place for students to place shirts and jackets. The screener should be five to eight feet from the student. Place a strip of tape on the floor to mark the place the student is to stand. Good lighting will facilitate the screening.

**Check students with their shirts removed. Girls are to be examined with their halter top, swim top, or sports bra on. If a girl prefers to wear a camisole, it should be rolled up so that her back can be viewed.**

It is important to respect and maintain the students' privacy. Students should not be in a location where they are able to see their peers receive the screening. An aide or volunteer may assist in maintaining the flow of students.

Record the name of each student in the class on a Spinal Screening Worksheet or use a classroom roster. Record all positive findings next to the student's name on the worksheet. If a student does not receive the screening, note the reason next to his/her name.

Arrange to re-screen students with positive or abnormal findings. Screen those students who missed the initial screening at that time as well.

Refer those whose spinal curve on the scoliometer is 7 degrees or more. If a student has a reading between 5 and 7 degrees, the Utah Department of Health

recommends rescreening that student in six months to a year in case the curve is increasing.

## **Follow-Up Activities**

### **Absentees**

Students who were not screened due to absence should be scheduled as soon as possible.

### **Exclusions**

Document exemption for any student excluded from screening.

### **Positive Findings**

While screening the absentees, use the session to re-screen all students with positive findings at the initial screening. The original worksheet may be used at the re-screening. If initial positive findings are not confirmed, the parents need not be contacted. If a positive finding is confirmed by the nurse who re-screens, the nurse should contact the parent, guardian, or managing conservator as specified in the following section.

### **Contacting the Parent/Guardian**

As a courtesy, the nurse may telephone the parents to explain that a professional evaluation is recommended. Inform parents that they will receive written notification of the screening findings in the form of a Parent Notification and Referral form (Appendix A), which they should take with them to the professional exam. This form is to be completed and returned to the school.

### **Follow-up Letter**

The Parent Notification and Referral form (Appendix A) should be used to notify parents of students who require referral to a physician. This form contains spaces to

record the results of the screening, and includes instructions to the parents, guardian or managing conservator to obtain a professional examination for their child by an appropriate health practitioner.

## **Referrals**

The school nurse should maintain a record of students who were referred for a professional examination.

The school nurse and physical education instructor should be aware of students who are undergoing treatment. The health care provider's recommendations will need to be followed.

## **Spinal Screening Report**

The Spinal Screening Report (Appendix A) enables the Utah Department of Health to collect data. In order to obtain accurate data, it is important that the Spinal Screening Report be as complete as possible.

Detailed instructions for completing the Spinal Screening Report are located on the back of each form. The Spinal Screening Report should be completed by the school or school district and returned to the Utah Department of Health no later than June 15<sup>th</sup> of each year.

## **Documentation**

Keep a record of the date and results of the screening as well as the results of any referrals.

# Appendix A

## Forms

## Sample Pre-Screening Letter to Parents

Dear Parent/Guardian

\_\_\_\_\_ School will be conducting spinal screening on \_\_\_\_\_. The purpose of spinal screening is to detect the signs of abnormal curves of the spine at their earliest stages so that the need for treatment can be determined. Scoliosis, a common spinal abnormality found in adolescents, is a sideways twisting of the spine. It is usually detected in children between 10 and 14 years of age. Kyphosis, sometimes called round back, is an exaggerated rounding of the upper back and is often confused with poor posture. Many cases of curvature of the spine are mild and require ongoing observation by a physician when they are first diagnosed. Others can worsen with time as the child grows and require active treatment such as bracing and surgery. Early treatment can prevent the development of a severe deformity, which can affect a person's appearance and health.

The procedure for screening is simple. Screeners who have been specially trained will look at your child's back while he/she stands and then bends forward. For this examination, boys and girls will be seen separately and individually.

STUDENTS SHOULD WEAR OR BRING SHORTS TO SCHOOL FOR THE EXAM. ALL STUDENTS MUST REMOVE THEIR SHIRT FOR THIS EXAM. FOR THIS REASON, WE REQUEST THAT GIRLS WEAR A SPORTS BRA, OR A TWO-PIECE SWIM SUIT TOP UNDERNEATH THEIR SHIRT ON EXAM DAY.

Parents will be notified of the results of the screening only if professional follow-up is necessary. This screening procedure does not replace your child's need for regular health care and check-ups.

If you do not wish to have your child screened, please notify the school office no later than \_\_\_\_\_.

Sincerely,

\_\_\_\_\_  
(School Administrator)

\_\_\_\_\_  
(School Nurse)

## Carta a los Padres Antes Del Examen

Estimados Padres o Guardianes:

La escuela \_\_\_\_\_ llevara a cabo un examen de la columna vertebral el dia \_\_\_\_\_. El proposito de este examen es detectar los sintomas de las curvaturas anormales de la columna vertebral en sus primeras etapas para determinar si es necesario un tratamiento mas profundo. La escoliosis es una abnormalidad comun de la columna vertebral hacia los lados que se observa usualmente en los adolescents. Usualmente es detectada en los ninios de 10 a 14 años de edad. La cifosis o usualmente llamada espalda encorbada, es una curvatura exagerada de la parte superior de la espalda y muchas veces es confundida con la mala postura. En algunas ocasiones, las curvaturas de la columna vertebral son leves y requieren solamente de observacion del medico despues de que han sido diagnosticadas por primera vez. Otras veces, las curvaturas de la escoliosis y cifosis pueden empeorar con el tiempo a medida de que el ninio crece y estas requieren de un tratamiento activo como aparatos ortopedicos y cirugia. El tratamiento a tiempo puede prevenir el desarrollo de una deformidad seria en la espalda, la cual puede afectar la apariencia y salud del joven.

El procedimiento del examen es simple. Las personas que examinan y que han sido entrenadas en esta especialidad, observaran la espalda de si hijo o hija mientras que el o ella permanecen de pie y despues se doblan agachandose hacia adelante. Para realizar este examen eficientemente, los estudiantes deben ser observados por separado e individualmente.

ES NECESARIO QUE LOS ESTUDIANTES TRAIGAN A LA ESCUELA O SE VISTAN CON PANTALONES CORTOS (SHORTS). TODOS LOS ESTUDIANTES SE DEBEN QUITAR LA CAMISA DURANTE EL EXAMEN, POR ESTA RAZON PEDIMOS QUE LAS NINIAS SE VISTAN CON UN BRASIER DEPORTIVO O CON UN TRAJE DE BANIO DEBAJO DE SU ROPA NORMAL EN EL DIA DEL EXAMEN.

A los padres se les notificara sobre los resultados del examen solamente si su hijo o hija necesita visitar a un doctor para consultar sobre la escoliosis o cifosis. Este examen no reemplaza la necesidad de atencion medica o de los exámenes físicos realizados por el doctor.

Si usted no desea que se le haga el examen a su hijo o hija, debera entregar esta forma firmada a la escuela no despues del dia \_\_\_\_\_.

Atentamente,

\_\_\_\_\_  
(Administrador de la Escuela/School Administrator)

\_\_\_\_\_  
(Enfermera de la Escuela/School Nurse)



## Spinal Screening Program Parent Notification and Referral

Student: \_\_\_\_\_ Birthdate: \_\_\_\_\_

Address: \_\_\_\_\_

School: \_\_\_\_\_ School Telephone: \_\_\_\_\_

Dear Parent/Guardian:

Students in our schools were recently screened for a curve of the spine that can appear during the years of rapid growth between ages 10 and 16 years. Your child has signs of a possible curve listed below.

Two kinds of curves are scoliosis (sidewase curve) and kyphosis (round back). It is your responsibility to take this form to a doctor of your choice who can do a complete check of the spine. After the doctor has examined your child and completed this form, please return it to school. If you cannot afford a doctor or have questions, contact the school for information.

Thank you for your cooperation: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of School Nurse  
or School Administrator

### School Screening Findings

L R

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

High Shoulder  
Shoulder blade stands out more than the other  
Obvious curve of the spine in area of rib cage

L R

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Rib hump  
Obvious curve of spine in lower back  
Hip higher than the other side

Rounded back

Other: \_\_\_\_\_

School Nurse: \_\_\_\_\_ Date: \_\_\_\_\_

### Physical Examination Report

Diagnosis: \_\_\_\_\_

Recommendations:

- No treatment  
 Observation only  
 Treatment:

Follow-up appointment scheduled (date): \_\_\_\_\_

Describe: \_\_\_\_\_

Activity Limitations: \_\_\_\_\_

Additional Comments: \_\_\_\_\_

Doctor's Signature/Stamp: \_\_\_\_\_ Date: \_\_\_\_\_

Doctor's Mailing Address/Phone: \_\_\_\_\_

For School Use:

Form completed and returned (name/date): \_\_\_\_\_

Form not returned (reason): \_\_\_\_\_

Sep-09

**PROGRAMA PARA EXAMEN DE LA COLUMNA VERTEBRAL  
NOTIFICACIÓN A LOS PADRES Y RECOMENDACIÓN CON ESPECIALISTA**

ESTUDIANTE: \_\_\_\_\_ FECHA DE NACIMIENTO: \_\_\_\_\_

DIRECCIÓN: \_\_\_\_\_

ESCUELA: \_\_\_\_\_ TELÉFONO DE LA ESCUELA: \_\_\_\_\_

Estimado padre o tutor:

Los estudiantes de nuestras escuelas fueron recientemente examinados para ver si tenían curvaturas de la espina dorsal, que se presentan durante los años de crecimiento acelerado en las edades de 10 y 16 años. Su niño muestra signos de posible curvatura y se describen a continuación.

Hay dos tipos de curvaturas, la escoliosis (la curvatura hacia los lados) y la cifosis (la espalda encorvada). Es responsabilidad suya llevar esta información al doctor que usted escoja y quien podrá hacer una evaluación completa de la espina dorsal. Después que el doctor examine a su niño y llene esta forma, sírvase devolverla a la escuela. Si usted no puede pagar la consulta con el doctor o tiene preguntas, póngase en contacto con la escuela para obtener más información.

Gracias por su cooperación: \_\_\_\_\_  
Firma del administrador escolar o enfermera \_\_\_\_\_ Fecha \_\_\_\_\_

**RESULTADOS DEL EXAMEN**

lza.	Der.		lza.	Der.
<input type="checkbox"/>	<input type="checkbox"/>	Hombro alto (high shoulder)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Omóplato que sobresale más que el otro (shoulder blade stands out)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Curvatura obvia de la espina en el área de la caja torácica (obvious curve of spine in rib cage area)	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
				Protuberancia en las costillas (rib hump)
				Curvatura obvia de la espina en la parte baja de la espalda (obvious curve of spine in lower back)
				Una cadera más alta que la otra (one hip higher)
			<input type="checkbox"/>	<input type="checkbox"/>
				Espalda encorvada (round back)

Otro: \_\_\_\_\_

Nombre y cargo de la persona que examinó en la escuela: \_\_\_\_\_ Fecha: \_\_\_\_\_

**PROFESSIONAL EXAMINATION REPORT: Diagnosis: \_\_\_\_\_**

Recommendations:

- No Treatment     Treatment:     Observation  
 Brace  
 Surgery  
 Other (please describe): \_\_\_\_\_  
 Referral (please describe): \_\_\_\_\_

Activity Limitation (if any, please describe): \_\_\_\_\_

Additional Comments: \_\_\_\_\_

Return Appointment:     No     Yes - Return Date: \_\_\_\_\_

\_\_\_\_\_  
 Doctor's signature or hand stamp \_\_\_\_\_ Date \_\_\_\_\_  
 Doctor's Mailing Address/Phone: \_\_\_\_\_

**For school use:**

This form completed and received by school (name/date): \_\_\_\_\_

This form not returned to school (reason): \_\_\_\_\_

# Spinal Screening Report

Name of School/District: \_\_\_\_\_  
 City: \_\_\_\_\_ County: \_\_\_\_\_  
 Contact: Name/title/phone/email: \_\_\_\_\_

Enter the total number of students in each category for each grade:

<b>Grade</b>	<b>Under prior treatment (no screening)</b>	<b>Screened</b>	<b>Rescreened</b>	<b>Referral</b>
5M				
5F				
6M				
6F				
7M				
7F				
8M				
8F				
9M				
9F				
<b>Totals</b>				

Submit this form to the Utah Department of Health, School Nurse Consultant by facsimile at 801.538.9440. Forms must be submitted by June 15<sup>th</sup> of each school year.

\_\_\_\_\_ Date: \_\_\_\_\_  
 School/District Nurse

## Instructions for completing and submitting the Spinal Screening Report

School districts, private school systems, and charter schools: use this form to report cumulative totals of the spinal screenings conducted at each of your campuses. Individual public/private school campuses within a district/system: this form is useful for reporting campus totals to the main office. The main office should transfer results from all campuses onto one form and submit it to the Utah Department of Health.

### Student Spinal Screening

**Grade:** Enter numbers for each category under the respective students' grade (5-9) and sex (M/F).

**Under prior treatment (no screening):** Enter the number of students who have already received professional treatment for a spinal abnormality. Do not screen these students and do not enter their diagnosis or treatment on the report form.

**Students Screened:** Enter the number of students screened.

**Rescreened:** Enter the number of students that received a second screening as result of a possibly abnormal finding during the initial screening.

**Referred:** Enter the number of rescreened students above whose parents were given a spinal screening parent notification and referral for a professional examination.

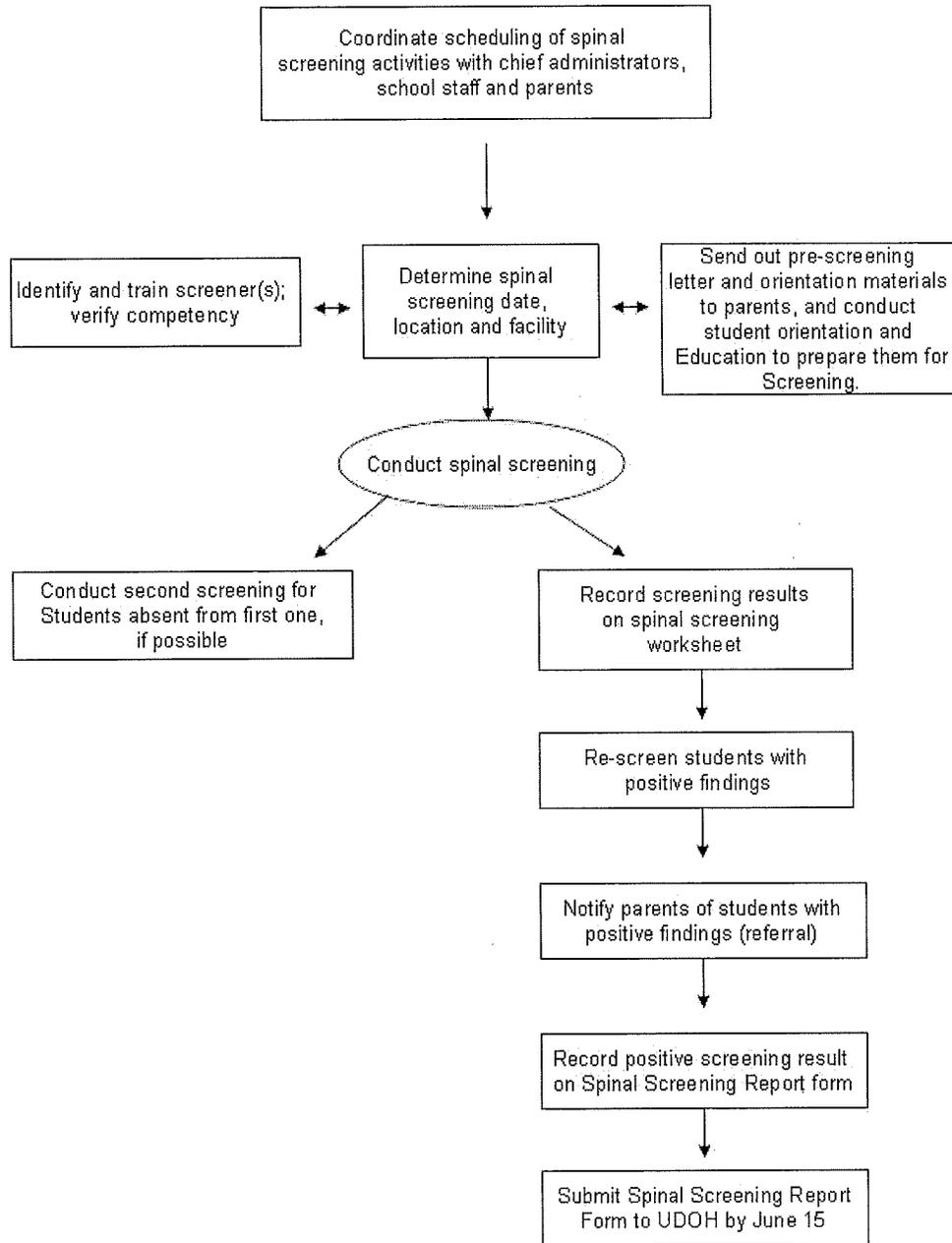
**Totals:** Sum the numbers in each column and enter them in the last row.

The form should be signed by the school/district nurse and submitted by facsimile (801.538.9440) to the Utah Department of Health, School Nurse Consultant by June 15<sup>th</sup> of each school year.

## **Appendix B**

### **Additional Materials and Resources**

### School Spinal Screening Flowchart



## Utah Law

**53A-11-201.** Rules for examinations prescribed by Department of Health -- Notification of impairment.

(1) (a) Each local school board shall implement rules as prescribed by the Department of Health for vision, dental, abnormal spinal curvature, and hearing examinations of students attending the district's schools.

(b) Under guidelines of the Department of Health, qualified health professionals shall provide instructions, equipment, and materials for conducting the examinations.

(c) The rules shall include exemption provisions for students whose parents or guardians contend the examinations violate their personal beliefs.

(2) The school shall notify, in writing, a student's parent or guardian of any impairment disclosed by the examinations.

Amended by Chapter 4, 1996 General Session

**53A-11-202.** Personnel to perform health examination.

A local school board may use teachers or licensed registered nurses to conduct examinations required under this chapter and licensed physicians as needed for medical consultation related to those examinations.

**School Spinal Screening Guidelines**  
**Utah School Nurses Association** **Fall Conference 2009**

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**Resources**

<b>Scoliometers</b>	School Health Corporation 1.800.323.1305 <a href="http://www.schoolhealth.com">www.schoolhealth.com</a>
<b>General Spinal Screening Information</b>	American Academy of Orthopaedic Surgeons <a href="http://aaos.org">http://aaos.org</a> National Scoliosis Foundation <a href="http://www.scoliosis.org">www.scoliosis.org</a> Scoliosis Research Society <a href="http://www.srs.org">www.srs.org</a> Shriners Hospital for Children-Utah <a href="http://www.shrinershq.org/Hospitals/Salt_Lake_City/default.aspx">http://www.shrinershq.org/Hospitals/Salt_Lake_City/default.aspx</a> Shriners Hospitals for Children—Salt Lake City This unique health care facility is dedicated to improving the lives of children by providing pediatric orthopaedic specialty care at no charge to patients or families. Children up to age 18 are eligible to receive care if there is a possibility they can benefit from the services available. Skilled orthopaedic surgeons are available to evaluate, monitor and treat idiopathic scoliosis. Admission is based solely on medical need. Neither income nor insurance status is criteria for a child's acceptance as a patient. For more information call 801-536-3500 or log on at <a href="http://www.shrinershospitals.org">www.shrinershospitals.org</a> .
<b>Financial Assistance</b>	CHIP and UPP are resources available to families who qualify.  Children's Health Insurance Partnership (CHIP) 1-877-KIDS-NOW <a href="http://health.utah.gov/chip">http://health.utah.gov/chip</a>  Utah's Premium Partnership for Health Insurance (UPP) <a href="http://health.utah.gov/upp">http://health.utah.gov/upp</a>
<b>Spinal Screening Report</b>	For questions about the report Utah Department of Health School Nurse Consultant 801-538-9450
<b>Utah School Nurses Association</b>	For questions about the training materials, contact USNA at <a href="http://www.utahschoolnurses.org">http://www.utahschoolnurses.org</a>

## **Definitions**

The most commonly used terms necessary for an understanding of identification, management and follow-up of abnormal spinal curvature.

**Abnormal spinal curvature** – an anatomic, structural deviation from the normal spine curve, such as scoliosis and kyphosis.

**Cervical spine** – neck portion of the spine.

**Cobb method** – method of measuring the angle of the scoliosis curve on a X-ray.

**Forward Bend Test** – procedure used to assess the possible presence of abnormal spinal curvature (also known as the Adams or 3-bend test).

**Idiopathic** – a condition with no known cause.

**Kyphosis** – abnormally increased roundness in the spine of the upper back as viewed from the side; also known as round back, hunchback, or humpback.

**Lordosis** – abnormally increased curvature in the spine of the lower back as viewed from the side; also known as sway back.

**Lumbar spine** – portion of the spine in the small of the back.

**Milwaukee brace** – an appliance used to treat abnormal spinal curvature.

**Orthosis** – the clinical term for brace.

**Sacrum** – lowest portion of the spine below the lumbar area.

**Scheuermann's disease** – abnormally increased roundness of the upper back as viewed from the side; kyphosis; hunchback or round back.

**Spinal instrumentation** – a surgical procedure for the correction of abnormal spinal curvature by insertion of rods and hooks to hold the spine in a corrected position.

**Scoliometer** – an apparatus for measuring the clinical deformity of patients with scoliosis.

**Screening** – a test or procedure to determine the need for a professional diagnostic examination.

**Spinal fusion** – joining together of spinal segments so that they function as one.

**Structural Scoliosis** – side-to-side curve of the spine with twisting of the affected vertebrae.

**Thoracic spine** – the chest part of the spine.

**TLSO (Thoracic Lumbosacral Orthosis)** – an orthosis designed to support and bend these parts of the spine.

## References

- Allington NJ, Bowen JR. Adolescent idiopathic scoliosis: treatment with the Wilmington brace. *J Bone Joint Surg.* 78A(7):1056-1062, 1996.
- Asher M, Beringer GB, Orrick J, and Halverhout N. The current status of Scoliosis screening in North America, 1986. *Spine* 14(7): 652-662, 1989.
- Bunnell W. An objective criterion for scoliosis screening. *J Bone Joint Surg.* 66A:1381, 1984.
- Bunnell W. The natural history of idiopathic scoliosis before skeletal maturity. *Spine.* 11(8): 773-776, 1986.
- Bunnell W. When does scoliosis need a referral? *Patient Care.* Sept. 1987, 53-60.
- Bunnell W. Outcome of spinal screening. *Spine.* 18(12): 1572-1580, 1993.
- Climent JM, and Sanchez J. Impact of the type of brace on the quality of life of adolescents with spine deformities. *Spine.* 24(18): 1903-8, 1999.
- Cote P, Kreitz BG, Cassidy JD, Dzuz AK, and Martel J. A study of the diagnostic accuracy and reliability of the scoliometer and Adam's forward bend test. *Spine.* 23(7): 796-802, 1998.
- Fallstrom K, Cochran T, and Nachemson A. Long-term effects on personality development in patients with adolescent idiopathic scoliosis. *Spine.* 11(7):756-768, 1986
- Goldberg CJ, Dowling FE, Hall JE and Emans JB. A statistical comparison between natural history of idiopathic scoliosis and brace treatment in skeletally immature adolescent girls. *Spine.* 18(7): 902-908, 1993.
- Goldberg CJ, Dowling FE, Fogarty EE, et al. School scoliosis screening and the United States Preventative Services Task Force. An examination of long-term results. *Spine.* 20(12): 1368-1374, 1995.
- Grossman TW, Mazur JM, & Cummings RJ. An evaluation of the Adams forward bending test and the scoliometer in a scoliosis school screening setting. *J Pediatr Orthop.* 15(4): 535-538, 1995.
- Haasbeck, JF. Adolescent idiopathic scoliosis. Recognizing patients who need treatment. *Postgraduate Medicine /Scoliosis.* 101(6): 287-216, 1997.
- Huang, S. Cut-off point of the scoliometer in school scoliosis screening. *Spine.* 22(17):1985-1989, 1997.
- Kahanovitz N and Weiser S. The psychological impact of idiopathic scoliosis on the adolescent female. *Spine.* 14(5): 483-485, 1989.

- Katz DE, Richards S, Browne, RH, & Herring, JA. A comparison between the Boston brace and the Charleston bending brace in adolescent idiopathic scoliosis. *Spine*. 22(12): 1302-1312, 1997.
- Little DG, Song KM, Katz D, and Herring JA. Relationship of peak velocity to other maturity indicators in idiopathic scoliosis in girls. *J Bone Surg AM*. 82(5): 685-93, 2000.
- Lonstein JE. Why school screening for scoliosis should be continued. *Spine*. 13:1198-1199, 1988.
- Lonstein JE. Adolescent idiopathic scoliosis. *The Lancet*. 344, 1407-1412, 1994.
- Lonstein JE. Scoliosis. *Lovell and Winter's Pediatric Orthopedics*. pp 625-680. Edited by RT Morrissy and SL Weinstein. Philadelphia. Lippincott-Raven. 1996.
- McLean WE, Green NE, Pierre CB, et al. Stress and coping with scoliosis: Psychological effects on adolescents and their families. *J Pediatric Orthop*. 9:257-261, 1989.
- Murrell GAC, Coonrad RW, Moorman CT, et al. An assessment of the reliability of the scoliometer. *Spine*. 18(6) 709-712, 1993.
- Nachemson AL and Peterson L. Effectiveness of treatment with a brace in girls who have adolescent idiopathic scoliosis. *J Bone Joint Surg*. 77A(6) 815- 822, 1995.
- Noonan KJ, Weinstein SL, Jacobson WC, et al. Use of the Milwaukee brace for progressive idiopathic scoliosis. *J Bone Joint Surg*. 78A(4) 557-567, 1996.
- Noonan KJ, Dolan LA, Jacobson WC, Weinstein SL. Long-term psychosocial characteristics of patients treated for idiopathic scoliosis. *J Pediatr Orthop*. 17(6): 712-7, 1997.
- Peterson, L, Nachemson AL. Prediction of progression of the curve in girls who have adolescent idiopathic scoliosis of moderate severity. *J Bone Joint Surg*. 77A(6): 823-827, 1995.
- Rowe DE, Bernstein SM, Riddick MF, et al. A meta-analysis of the efficacy of non-operative treatments for idiopathic scoliosis. *J Bone Joint Surg* 79(5): 664-674, 1997.
- Scoliosis Research Society Graphics Scoliosis Research Society. Screening Procedure Guidelines for Spinal Deformity. Scoliosis Research Society. Rosemont, Ill: 1995.
- Scoliosis Research Society. Spinal Deformity: Scoliosis and Kyphosis A Handbook for Parents. Scoliosis Research Society. Rosemont, Ill: 1995.
- Sorenson KH. Scheuermann's Juvenile Kyphosis. Copenhagen, Munksgaard, 1964.
- Torell G, Nordwall A, and Nachemson A. The changing pattern of scoliosis treatment due to effective screening. *J Bone Joint Surg*. 63A(3): 337-341, 1981.
- Treuer S, Kleinman R, and Bleck EE. Growth landmarks and the evolution of scoliosis: A review of pertinent studies on their usefulness. *Develop. Med. Child. Neurol*. 22:675 - 684, 1980.
- Upadhyay SS, Nelson IW, Ho EKW et al. New prognostic factors to predict the final outcome of brace treatment in adolescent idiopathic scoliosis. *Spine*. 20(5): 537-545, 1995.

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- Yawn BP, Yawn RA, Hodge D, Kurland M, Shaughnessy WJ, Ilstrup D, and Jacobsen SJ. *JAMA*.282(15):1427-32,1999.
- Yawn BP, and Yawn RA. The estimated cost of school scoliosis screening. *Spine*. 25(8):2387-2391, 2000.
- Weinstein SI, Zavala DC, and Ponseti IV. Idiopathic scoliosis: long term follow up and progression in untreated patients. *J Bone Joint Surg*. 63A: 702-712,1981.
- Weinstein, SL. Adolescent idiopathic scoliosis: prevalence and natural history. *Instructional Course Lectures XXXVIII*:115-128.
- Winter RB. The pendulum has swung too far. Bracing for adolescent idiopathic scoliosis in the 1990s. *Othopedic Clinics of North America*. 25(2):195-204, 1994.
- Wynne-Davie R. Familial (idiopathic) scoliosis: a family survey. *J Bone Joint Surg*. 50(1):24-30, 1968.

## SPINAL SCREENING WORKSHOP PRE-TEST

Name: \_\_\_\_\_

In front of each statement, place a **T** for True or an **F** for False.

- \_\_\_\_\_ 1. Boys and girls have an equal chance of developing scoliosis, but curves that progress occur mostly in girls.
- \_\_\_\_\_ 2. Most cases of scoliosis are usually detected during early adolescence.
- \_\_\_\_\_ 3. Kyphosis is an exaggerated arch or roundness of the spine during early adolescence.
- \_\_\_\_\_ 4. One problem with scoliosis is that no one can predict for sure which curves will progress, so it requires monitoring to see if it is getting worse.
- \_\_\_\_\_ 5. The success of bracing depends on the number of hours the brace is worn.
- \_\_\_\_\_ 6. Scoliosis is a side to side curve of the spine.
- \_\_\_\_\_ 7. Kyphosis is often mistaken for poor posture.
- \_\_\_\_\_ 8. Diseases with well known causes are known as "idiopathic."
- \_\_\_\_\_ 9. Although scoliosis may be present in 2% to 3% of the adolescent population, the number of cases requiring bracing or surgery is very small.
- \_\_\_\_\_ 10. The state law requiring spinal screening is optional.
- \_\_\_\_\_ 11. Screener certification is valid indefinitely.
- \_\_\_\_\_ 12. Tracking referrals to assure that a proper diagnosis is made when abnormalities are suspected is part of an effective screening program.
- \_\_\_\_\_ 13. Children who were not screened because of absence may wait until the following year to be screened.
- \_\_\_\_\_ 14. The recommended test for the detection of spinal deformity is known as the forward-bend test.
- \_\_\_\_\_ 15. All children adapt easily to the use of the brace.
- \_\_\_\_\_ 16. A parent may choose to take his/her child to a doctor for a professional evaluation in lieu of screening.
- \_\_\_\_\_ 17. There are resources for an orthopedic evaluation if the family has no money.
- \_\_\_\_\_ 18. A referral is considered complete when the outcome of the student's professional examination (referral results) has been reported to the school nurse.

END OF PRE-TEST

**Spinal Screening Program**

**PRACTICUM CHECKLIST (see pages 9-12 of guideline)**

**SCREENER:**

**P**

- 1. Greets student \_\_\_\_\_
- 2. Gives clear instructions for Position 1 \_\_\_\_\_
  - a. Checks for shoulder height \_\_\_\_\_
  - b. Checks for unequal space between arms and flanks \_\_\_\_\_
  - c. Checks for uneven hips \_\_\_\_\_
- 3. Gives clear instructions for Position 2 \_\_\_\_\_
  - a. Checks for chest cage hump \_\_\_\_\_
  - b. Checks for lumbar hump \_\_\_\_\_
- 4. Gives clear instructions for Position 3 \_\_\_\_\_
  - a. Checks for exaggerated roundness in upper back \_\_\_\_\_
  - b. Checks for exaggerated arch in lower back \_\_\_\_\_
- 5. Gives clear instructions for Position 4 \_\_\_\_\_
  - Checks for exaggerated roundness on upper back \_\_\_\_\_
  - or between lower rib cage and small of the back \_\_\_\_\_
- 6. Gives clear instructions for Position 5 \_\_\_\_\_
  - a. Checks head alignment \_\_\_\_\_
  - b. Checks shoulder height \_\_\_\_\_
  - c. Checks for asymmetry of shoulder blades (one stands out more or is higher than the other) \_\_\_\_\_
  - d. Checks for spine curve \_\_\_\_\_
  - e. Checks for unequal spaces between arm and flanks on either side of body \_\_\_\_\_
- 7. Gives clear instructions for Position 6 \_\_\_\_\_
  - a. Checks for chest cage hump \_\_\_\_\_
  - b. Checks for lumber hump \_\_\_\_\_

Screener's Name: \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator: \_\_\_\_\_

**Spinal Screening Program**  
**SPINAL SCREENING WORKSHOP**  
**POST TEST**

Name: \_\_\_\_\_

**For questions 1-9:**

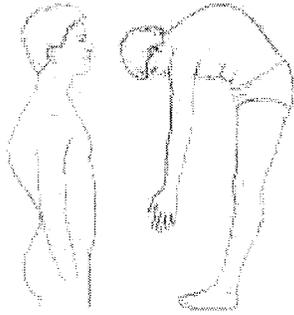
circle "T" for true statements or "F" for false statements.

1. The goal of spinal screening in the school is to identify spinal curves early and refer to prevent progression.
2. Carrying a heavy load such as books on one side can cause idiopathic scoliosis.
3. To get the best results from a spinal orthosis (brace), the student needs to wear it as prescribed.
4. If positive findings are present after the first spinal screening, the next step is to notify the parents.
5. An appearance of a curve means you have identified scoliosis.
6. According to Utah law, screening for abnormal spinal curvature must be performed on children between ages 10 and 14.
7. A child who is home ill on screening day should be rescheduled for screening within two weeks of the missed screening.
8. Serious progression of a spinal curve is most likely to occur during the rapid growth spurt of adolescents.
9. If a family has no financial resources for an orthopedic evaluation, no referral can be made or treatment received.

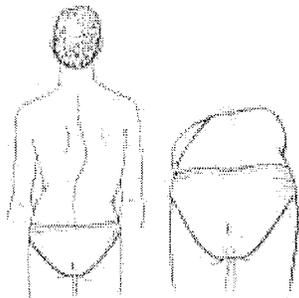
**For questions 10 – 20, match each statement with the correct response.**

Circle **R** for **Rescreen/ Refer** or **N** for **Normal Finding**.

10. One shoulder higher than the other
11. Head centers directly above pelvis
12. One shoulder blade higher or more prominent than the other
13. Equal space between the arms and the body on both sides
14. One hip higher than the other
15. Space between the arms and the body is greater on one side than the other
16. Excessive roundness of the thoracic spine seen in the side view
17. Upper body appears to lean to one side even when they stand up straight
18. The head is not centered directly above the pelvis
19. The drawing below illustrates a student who you would R (rescreen/refer) or N (normal finding).



20. The drawing below illustrates a student who you would R (rescreen/refer) or N (normal finding).



**Questions 21 – 25** are multiple choice. Circle the correct answer for each question. There is only one correct answer per question.

21. What is the most important factor in the treatment of spinal problems?

- a. Bracing only
- b. Surgery and a brace
- c. Surgery following exercise
- d. Early detection

22. When screening, the student will be viewed both standing and bending over

- a. From the front and back
- b. From the back only
- c. From the side and back
- d. From the front, side and back

23. When is a referral considered complete?

- a. When the family is notified to see a physician
- b. When the child is evaluated by the physician
- c. When the physician decides to start treatment

- d. When the physician's evaluation is reported to the school nurse.
24. How can the screener help the student who has been diagnosed with a spinal deformity?
- a. Tell them they should never participate in any sports
  - b. Encourage them to follow their treatment plan
  - c. Tell them surgery is always needed
  - d. Encourage them to see you monthly for re-screening
25. What is the cause of idiopathic scoliosis?
- a. Participating in heavy contact sports
  - b. Slouching while watching television
  - c. Carrying a heavy book bag over one shoulder
  - d. The actual cause is unknown

END OF POST-TEST

**SPINAL SCREENING CERTIFICATION WORKSHOP**

**POST-TEST ANSWER SHEET**

**Name:** \_\_\_\_\_

(Circle your answers)

- |         |             |
|---------|-------------|
| 1. T F  | 13. R N     |
| 2. T F  | 14. R N     |
| 3. T F  | 15. R N     |
| 4. T F  | 16. R N     |
| 5. T F  | 17. R N     |
| 6. T F  | 18. R N     |
| 7. T F  | 19. R N     |
| 8. T F  | 20. R N     |
| 9. T F  | 21. a b c d |
| 10. R N | 22. a b c d |
| 11. R N | 23. a b c d |
| 12. R N | 24. a b c d |
|         | 25. a b c d |

Answers to Pre-Test

1	T	10	F
2	T	11	T
3	T	12	F
4	T	13	T
5	T	14	T
6	T	15	F
7	T	16	T
8	F	17	T
9	T	18	T

Answers to Post Test

1	T	14	R
2	F	15	R
3	T	16	R
4	F	17	R
5	F	18	R
6	T	19	R
7	F	20	R
8	T	21	D
9	F	22	D
10	R	23	D
11	N	24	B
12	R	25	D
13	N		