



**Minnesota Department of Health  
2008 Scoliosis School Screening Workgroup  
Saint Paul, Minnesota**

**October 13, 2008**

**4:00-6:00 pm**

**Meeting Summary**

The Minnesota Department of Health (MDH) Scoliosis School Screening Workgroup met October 13, 2008 at Snelling Office Park in St. Paul, MN (see attachment for list of attendees). The purpose of the meeting was to provide recommendations on school-based scoliosis screening to the MDH. Dr. Penny Hatcher, MDH Child and Adolescent Health Unit Supervisor, opened the meeting with a welcome and introductions. Georgie Peterson, meeting facilitator, reviewed the meeting agenda and logistics.

Dr. Hatcher presented a summary of the literature review and briefly outlined the purpose of the workgroup, principles of screening, overview of scoliosis, history of school-based screening for scoliosis in Minnesota, current role and recommendations of the MDH and other organizations, available screening tools, and referral criteria.

Some workgroup members asked about criteria used for the literature review. The literature review consisted of: (A) contacting professionals for guidance on current literature and recommendations and (B) conducting a general literature review through the MDH library. Professionals who were contacted included Gillette Children's Specialty Healthcare, Shriners Hospital for Children, the National Scoliosis Foundation, and several nurses involved in starting school-based scoliosis screening in MN. There were additional research studies that could have been included, such as existing research documents, in-process clinical trials, and the recommendation of the American Academy of Family Physicians. Workgroup members were invited to submit additional references that were not included in the September 2008 MDH Review of the Literature and Current Practice Recommendations (see "Additional References" on last page). Although some information may have been missing, the workgroup decided it was possible to move ahead addressing the five key questions.

Prior to addressing the five key questions, preliminary discussion included the following topics (all information and statistics below were provided by workgroup members during the discussion and were not verified unless otherwise noted):

**Calculation of scoliosis prevalence**

The summary presentation included the note "Most studies agree that girls have a higher prevalence of scoliosis than boys." A workgroup member stated that the

definition of prevalence should be clarified, and that it is the probability of progression that is higher in girls than in boys, not necessarily the prevalence.

### **Scoliosis prevalence and treatments in the past compared with today**

Scoliosis used to be more common as a resulting complication of polio. Surgical treatment in the 1960s and 1970s required body casts post-operatively for 6-12 months and resulted in substantial morbidity. Surgical fusion resulted in 50-60% success rates.

Today, surgical treatment is over 95-99.5% successful. Neurologic compromise occurs in approximately 1/2000 surgical patients (unclear if this data refers to paraplegia or other nerve damage). Those with curves greater than 90 to 100 degrees have neurologic compromise rate of 10%. Estimated costs associated with each case of paraplegia are \$1-1.5 million in lifetime care.

### **Risks and values of screening**

Risks include neurologic compromise (see discussion above) and negative implications of referral including multiple x-rays and social outcomes. For screening to be valuable, the following principles of screening need to be met: (1) health problem seen as important; (2) includes an asymptomatic phase during which screening is the only way to identify; (3) simple test available; (4) has an accepted treatment; (5) has an accepted benefit; and (6) benefits outweigh costs of screening.

### **Bracing**

A current prospective study examining the effectiveness of bracing, electrical stimulation, and non-treatment was mentioned. The prospective study followed curve progression with the above mentioned treatments. Another workgroup member stated that approximately 80% of children treated with a brace do not need surgery.

### **Genetic testing**

For children with Adolescent Idiopathic Scoliosis, a genetic test is available that predicts curve progression with 87-90% accuracy. The test examines 53 markers, with scores ranging from 1-200. Children with a score of 40 or less are not likely to have a curve that progresses. Cost for each test may be up to \$3,000. The workgroup decided that genetic testing was a “second step” and would not immediately affect school-based scoliosis screening.

### **Number of Minnesota schools/students**

In response to a question regarding the number of students in Minnesota, a Minnesota Department of Education representative provided the following school statistics. There are approximately:

- ▶ 890,000 students, 10% of which are non-public or home-schooled
- ▶ 60,000 students per grade
- ▶ 1500 buildings: 900 elementary, 400 high school, remainder are mix of middle schools, etc.
- ▶ 150 charter schools

### **Possible addition of scoliosis screening on MN State High School League Sports Qualifying Physical Examination Clearance form**

Workgroup members discussed the possibility of adding scoliosis screening to the Minnesota State High School League Sports Qualifying Physical Examination Clearance form. The workgroup decided against adding the screening to the form. While the form does not include a specific screening for scoliosis, it does list an examination of the back as a required component. Concern was expressed that addition of further requirements would make the physical too long.

### **Role of Child & Teen Checkups**

Minnesota Department of Health/Department of Human Services recommended the use of Child & Teen Checkups documentation templates that include spinal and postural examination for children ages 8-10 and 11-14.

Discussion was opened to the workgroup to address five key questions. Written comments from absent workgroup members were read during discussions.

Discussion of each key question concluded with a show-of-hands vote. Votes for absentee workgroup members were counted based on input submitted prior to the meeting. The MDH employees attending for supporting purposes did not vote (see attached list of attendees for non-voting workgroup members). Workgroup recommendations reflect the majority vote for each key question.

### **Key Questions**

- 1. What could be the MDH's overall recommendation for school scoliosis screening?**
  - a. Universal screening in schools
  - b. \*Selective screening in schools**
  - c. No screening in schools
  - d. Neutral – screening as a local school decision

#### ***Key discussion points:***

Prior to voting on what to recommend, there was group discussion regarding the value of screening and the risks of screening and/or treatments. The consensus among the group was that screening should only occur if acceptable methods of treatment currently exist. The workgroup decided that bracing, whether effective or not, is an accepted treatment. The workgroup also discussed the purpose of current treatment and its effectiveness in preventing deleterious outcomes.

Additionally, the workgroup discussed concerns related to the cost and potential benefits of school-based screening. Many schools perform multiple screenings on the same day (e.g. hearing and vision) and implement creative solutions to complete these screenings effectively and efficiently.

Workgroup members contended that the MDH assuming a neutral position would effectively equal recommending against screening in schools.

**Workgroup Recommendation:** b. Selective screening in schools.

**2. What could the periodicity schedule be for school scoliosis screening?**

- a. Gender
- b. Age

**Key discussion points:**

Workgroup members concluded that one year before menarche is the optimal time to screen girls (workgroup members defined normal range of menarche as approximately 9 to 15 years old). Several workgroup members questioned the age of menarche in females, including immigrants, and the possible impact on recommended screening ages. Note: Research examining the Third National Health and Nutrition Examination Survey (NHANES III) data (see “Additional References” on last page) found that 50% of girls have reached menarche at 12.43 years of age (Chumlea et al., 2003).

**Workgroup Recommendation:** Girls are to be screened in the fall of 5<sup>th</sup> grade AND spring of 6<sup>th</sup> grade. No screening recommended for boys.

**3. What screening methods could be used?**

- a. Visual Examination
- b. Adam's Forward Bending Test (FBT)
- c. \*Scoliometer
- d. Other

**Key discussion points:**

The workgroup recommended the use of the scoliometer per instructions. As the child is already in a forward bending position with proper use of the scoliometer, the workgroup decided it was unnecessary to refer to the Adam's Forward Bending Test in the recommendation.

**Workgroup Recommendation:** c. Scoliometer, used according to instruction.

**4. Referral:**

- a. What constitutes referral criteria for school scoliosis screening?
- b. To whom could a child be referred?
- c. What criteria could be used to rescreen a child in a school & how often could rescreening occur?

***Key discussion points:***

The workgroup determined that eliminating the watch list and referring children to a primary care clinician with an angle of trunk rotation (ATR) of 6 degrees or greater may alleviate school challenges in monitoring and rescreening children.

***Workgroup Recommendation:*** Refer all children screened with an ATR greater than or equal to 6 degrees. A child should be referred to their primary care clinician. No watch list or further rescreening is recommended for children with an ATR less than 6 degrees.

**5. What could be the role of MDH in Scoliosis Screening in Schools?**

*Although the workgroup was not able to address this key question due to lack of time, the MDH proposes the following role:*

The MDH child health staff, including school health consultant (Cheryl Smoot) will offer direct and indirect support, education, and training on scoliosis screening. The MDH will provide consultation and technical assistance to Gillette Children's Specialty Healthcare and Shriners Hospitals for Children for scoliosis screening education and training. The MDH website will be kept up-to-date on school-based scoliosis screening recommendations, including recommendations from the workgroup.

**Additional References:**

*Not provided at time of workgroup meeting*

**Bracing**

Fernandez-Feliberti, R. (1995). Effectiveness of TLSO bracing in the conservative treatment of idiopathic scoliosis. *J. Pediatric Orthopaedics* 15:176-181.

Lonstein, J.E. (1994). The Milwaukee Brace for the treatment of adolescent idiopathic scoliosis: a review of one thousand and twenty patients. *J. Bone & Joint Surgery* 76:1207-1221.

Nachemson, A.L., Peterson, L.E. (1995). Effectiveness of treatment with a brace in girls who have adolescent idiopathic scoliosis. *J. Bone & Joint Surgery* 77:815-822.

Rowe, D.E., Bernstein, S.M., Riddick, M.F., Adler, F., Emans, J.B., and Garderner-Bonneau, D. (1997). A meta-analysis of the efficacy of non-operative treatments for idiopathic scoliosis. *J. Bone & Joint Surgery* 79:664-674.

**Effectiveness of Screening**

Richards, B.S., Beaty, J.H., Thompson, G.H., Willis, R.B. (2008). Estimating the effectiveness of screening for scoliosis. *Pediatrics* 121(6):1296-1297.

**Age at Menarche**

Chumlea, W.C., Schubert, C.M., Roche, A.F., Kulin, H.E., Lee, P.A., Himes, J.H., and Sun, S.S. (2003). Age at menarche and racial comparisons in US girls. *Pediatrics* 111:110-113.

Euling, S.Y., Herman-Giddens, M.E., Lee, P.A., Selevan, S.G., Juul, A., Sorensen, T.I.A., Dunkel, L., Himes, J.H., Teilmann, G., and Swan, S.H. (2008). Examination of US puberty-timing data from 1940 to 1994 for secular trends: panel findings. *Pediatrics* 121:S172-S191.

**Recommendation of the AAFP**

U.S. Preventive Services Task Force. Screening for Idiopathic Scoliosis in Adolescents: Recommendation Statement. (May 15, 2005). *American Family Physician*. Available online at: <http://www.aafp.org/afp/20050515/us.html>.

**New training video:**

Medtronic and Scoliosis Research Society. "Spine Check: A School Nurse's Guide to Scoliosis Screening." (Oct. 2008).

*MDH staff viewed video. Video contains no mention or demonstration of scoliometer.*