Medical screening policy and physical assessment - Scoliosis

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Objectives

- Importance of screening
- Components of screening
- Scoliosis as special entity.
Introduction

In order to address potential health problems that are barriers to learning or symptoms of underlying medical condition, a school often engages in screening activities.

Screening activities include vision, hearing, postural assessment, BMI etc.
The HAAD recommendations

- All students from Grade 1-12 are required to receive the following screening tests on an annual basis. This screening is conducted by the School Nurse at the school.
  1. Medical History
  2. Body Mass Index (BMI percentile)
  3. Vision Screening (Eyesight test)
HAAD’s Comprehensive screening

- **Grade 1:**
  1. Medical History (M)
  2. Body Mass Index (BMI percentile) (M)
  3. Vision Screening (Eyesight test) (M)
  4. Hearing Screening ®
  5. CBC ®
  6. Physical Examination ®
  7. Dental Screening ®

*M = Mandatory  R = Highly Recommended*
Continuation...

- **Grade 5:**
  1. Medical History (M)
  2. Body Mass Index (BMI percentile) (M)
  3. Vision Screening (Eyesight test) (M)
  4. Hearing Screening ®
  5. Physical Examination ®
  6. Dental Screening ®

*M = Mandatory  
*R = Highly Recommended*
Continuation...

- **Grade 9:**
  1. Medical History (M)
  2. Body Mass Index (BMI percentile) (M)
  3. Vision Screening (Eyesight test) (M)
  4. Hearing Screening ®
  5. CBC (for females why?)®
  6. Physical Examination ®
  7. Dental Screening ®

*M = Mandatory  R = Highly Recommended*
## HAAD School Screening Tests Schedule

<table>
<thead>
<tr>
<th>Grade</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>*</td>
<td>*</td>
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<td>*</td>
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<td>*</td>
<td>✓</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<tr>
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<td>*</td>
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<td>*</td>
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<td>*</td>
<td>✓</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td></td>
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<td></td>
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<td></td>
<td>✓</td>
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<td>Complete blood count R</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓ (f)</td>
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<tr>
<td>Dental screening R</td>
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<td></td>
<td>✓</td>
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<td></td>
<td>✓</td>
<td></td>
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</table>

### Additional information:
- In addition, school nurses should give health promotion guidance to students during individual consultation and to groups, on topics including nutrition, physical activity, preventing injuries, smoking prevention oral health and mental health.
- School nurses should request a medical history for all students joining the school (including KG).
- If a child joins the screening program for the first time; all catch-up screening tests must be done.

### Keys:
- **m**: Male
- **f**: Female
- **M**: Mandatory
- **R**: Highly recommended
- **✓**: Screen when
Body Mass Index (BMI)

- Understand BMI and its importance for health care providers
- Learn how to plot BMI on the BMI-for-age growth charts
US Preventive Task Force:

- Screening for Obesity in Children and Adolescents
- Summary of Recommendation
  The USPSTF recommends that clinicians screen children aged 6 years and older for obesity and offer them or refer them to comprehensive, intensive behavioral interventions to promote improvement in weight status.

The Global School-Based Student Health Survey (2005):

- 21.3 % at risk of becoming obese.
- 11.8 % of 13 to 15 year olds in the UAE were obese.

The Global School-Based Student Health Survey (2010):

- 38.4 % of students in grades 8, 9, and 10, were overweight.
- 14.4 % of students who were obese.

Diabetes rate in the United Arab Emirates is the second highest in the world.
Body Mass Index

• An indicator used to determine whether a person is at a healthy body weight.

• Body Mass Index (BMI) = Weight (kg) / Height (m)^2

• BMI is an effective SCREENING test to check for possible overweight; but alone it is not a diagnostic tool
Body Mass Index (BMI percentile)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Principal cut-off points</th>
<th>Additional cut-off points</th>
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</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.50</td>
<td>&lt;18.50</td>
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<tr>
<td>Severe thinness</td>
<td>&lt;16.00</td>
<td>&lt;16.00</td>
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<tr>
<td>Moderate thinness</td>
<td>16.00 - 16.99</td>
<td>16.00 - 16.99</td>
</tr>
<tr>
<td>Mild thinness</td>
<td>17.00 - 18.49</td>
<td>17.00 - 18.49</td>
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<tr>
<td>Normal range</td>
<td>18.50 - 24.99</td>
<td>18.50 - 22.99</td>
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<tr>
<td>Overweight</td>
<td>25.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Pre-obese</td>
<td>25.00 - 29.99</td>
<td>25.00 - 27.49</td>
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<tr>
<td>Obese</td>
<td>30.00</td>
<td>27.50 - 29.99</td>
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<tr>
<td>Obese class I</td>
<td>30.00 - 34.99</td>
<td>30.00 - 32.49</td>
</tr>
<tr>
<td>Obese class II</td>
<td>35.00 - 39.99</td>
<td>32.50 - 34.99</td>
</tr>
<tr>
<td>Obese class III</td>
<td>40.00</td>
<td>37.50 - 39.99</td>
</tr>
</tbody>
</table>

BMI is Not the Same for Adults and Children

• Adult BMI is evaluated by use of cut-off numbers; for example BMI >30 is indicative of adult obesity

• The BMI for children is useful only when it is plotted on the “BMI-for-age Growth Chart”
CDC Standardized Growth Chart

Formula to calculate BMI

Percentiles (5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th)

Published May 30, 2000
Using BMI-for-age Percentiles to Assess Risk

- > 95th percentile: Obesity
- 85th to < 95th percentile: Overweight
- Between the 5th and 85th percentile: Healthy weight
- < 5th percentile: Underweight
Measurements

• BMI measurements between the 5th and 85\textsuperscript{th} percentiles are considered in normal range.

• BMI’s outside this range indicate a need for further assessment.

• Children and teens with a BMI above the 95\textsuperscript{th} percentile are more likely to have risk factors for cardiovascular disease and become overweight adults and may need further intervention.
Measurements

- Children and teens under the 5th percentile may be at risk and may need further intervention.

- Further investigation is warranted if a child’s growth pattern makes a major shift.
Scoliosis
Why should school screen for scoliosis

Without a screening program scoliosis may go undetected because.

• Students are unlikely to receive physical exams at this age unless they have health problems
• Scoliosis is painless, no symptoms other than abnormal curve in the back
• Idiopathic scoliosis often develop during pre adolescence and could be detected by parents when children are unclothed
• Long hair and loose clothes can conceal the deformity.
Outline:

- Vertebral Column
- Normal Spine Curvatures
- What is Scoliosis?
- Forms & Causes of scoliosis
- Symptoms of scoliosis
- Diagnosis
- Scoliosis treatment
- Scoliosis screening
The spinal column (or vertebral column) extends from the skull to the pelvis and is made up of 33 individual bones termed vertebrae. The vertebrae are stacked on top of each other group into four regions:

<table>
<thead>
<tr>
<th>Term</th>
<th># of Vertebrae</th>
<th>Body Area</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Cervical</td>
<td>7</td>
<td>Neck</td>
<td>C1 – C7</td>
</tr>
<tr>
<td>Thoracic</td>
<td>12</td>
<td>Chest</td>
<td>T1 – T12</td>
</tr>
<tr>
<td>Lumbar</td>
<td>5 or 6</td>
<td>Low Back</td>
<td>L1 – L5</td>
</tr>
<tr>
<td>Sacrum</td>
<td>5 (fused)</td>
<td>Pelvis</td>
<td>S1 – S5</td>
</tr>
<tr>
<td>Coccyx</td>
<td>3</td>
<td>Tailbone</td>
<td>None</td>
</tr>
</tbody>
</table>
Normal Spinal Curvature

There are 4 natural curves in the vertebral column.
Linear Spinal Curvatures

Kyphosis
Spine curves backward in the chest area “Roundback”

Lordosis
Spine curves forward at the waist “Swayback”

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Sideways curvature of the spine

- Scoliosis

- Spine turns on its axis like a corkscrew

- Normal spine has a “I” appearance

- Scoliosis produces an “S” or “C” appearance
Degrees of Curvature

Scoliosis is a lateral deviation of the normal vertical line of the spine which, when measured by an X-ray, is greater than 10 degrees.

- **MILD**
  - 10-15°

- **MODERATE**
  - 16-23°

- **SEVERE**
  - 24-44°
Most Common Forms

1. Right thoracic 90% of thoracic curvatures are to the right

2. Right thorocolumbar

3. Left lumbar

4. Double major-S curve
Causes for Scoliosis

**Congenital**
- Problem with the formation of vertebrae or fused ribs during prenatal development
- Present at birth

**Neuromuscular, Connective Tissue & Chromosomal Abnormalities**
- Caused by a neurological disorder of CNS or muscular weakness
- Cerebral palsy, Muscular dystrophy, Spina bifida, Paralysis
Continuation...

- Marfan’s Syndrome
- Down’s syndrome

**Idiopathic**

- Structural spinal curvature with no established cause
- Appears in a previously straight spine
- 80-85% of cases
Signs of Scoliosis

1. Whole body leaning to one side

2. Uneven shoulder height

3. One hip sticks up higher than the other (Parents often first notice possible scoliosis when they see that one pant leg is shorter than the other.)

4. Uneven rib cage

5. Rib protrusion on one side of the spine
Diagnosis

- Physician Physical Exam
- Scoliometer measurements
- X Ray
- MRI
Incidence

- 10% of population will have some degree of adolescent curvature
- Affects approx 1 million children in the US
- 3-5 out of every 1,000 cases are severe enough to require treatment
- 25% will require medical attention to monitor for progression
Continuation...

YEARLY in the US (all forms)

- Affects 2-3% of the general population - 6 million
- 600,000 physician office visits
- 30,000 children are treated with a brace
- 38,000 undergo spinal surgery

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Scoliosis Treatment

Observation:
- Minor curvatures (<20 degrees)
- Skeleton is close to maturity
- Exercises may help with surrounding muscular strength

Brace:
- Around torso and hips
- Helps hold spine in place while it grows
- Can be removed for sports

Surgery:
- Major curvatures (>45 degrees)
- Rapid deterioration/progression
- Generally spinal fusion
Weighing In on the Back Pack Issue

• Children should carry no more than 10-15% of their body weight in a backpack.

• Backpack should be worn on BOTH shoulders to evenly distribute the weight

• Heaviest books should be closest to the back
Scoliosis Facts

- Race, ethnic background & socioeconomics do not appear to be factors
- Tends to occur in families
- Usually painless and without symptoms; child is generally unaware of curvature
- Untreated scoliosis of greater than 30 degrees can lead to back pain in adults
60% of curvatures in rapidly growing pre pubertal children will progress

Increased risk for osteoporosis & gall bladder problems later in life

Poor nutrition may play a role
Girls Vs Boys

- Primary age of onset 10-15 years
  During the last major growth spurt of adolescence

- Time of greatest risk:
  **Girls:** 6 months before & after onset of menstruation
  **Boys:** Time when their voices deepen risk

- Mild scoliosis occurs equally between boys and girls.

- More serious curves (>30 degrees) are 8-10X greater in **girls** than in **boys**.
Screening

Purpose:
Identify physical characteristics that are suggestive of excessive or abnormal curvatures of the spine
Screening is not meant to be a diagnostic exam or substitute for physician evaluations

Target Population:
Adolescents during age of puberty and accelerated growth 7th graders

Adolescents have a decreased frequency of routine physical exams
HAAD Recommendation

Updated HAAD Standards for School Health Screening (version 0.9):

“Scoliosis screening to be recommended for G5 (M& F) and G7 (M)”

However, it was decided to delay it until Phase 2 of implementation.
Screening Program

- Screening averages approx 1-2 min per student

- Screening for most schools can be completed in 1-2 hrs

- Nurses must review scoliosis training either via classroom or self review module every 2 years. After training review each nurse will confirm update by signing a confirmation form and faxing to chapter office.
Parent Permission Form

Permission form MUST have:
✓ Parent signature
✓ YES permission given

Make sure student name, address are legible and complete with City & Zip

After screening be sure to mark Positive or Negative and Initials BEFORE moving on to the next student

Turn forms over so other students cannot see their classmate’s form.
Student position

- Lose, not tense or stiff
- Be sure student holds head/chin up
- Looking forward- not down
- Relaxed shoulders & arms
- Knees straight
- Stand with feet slightly apart
- Toes on the tape
the screener stands 1.2-2.4 m from the tape mark.

Steps of Screening Process

1. Standing Position
   ✓ Observe from front
   ✓ Observe from Side
   ✓ Observe from back

2. Forward Bending Position (Adam’s Test)
   ✓ Observe from Back
   ✓ Observe from Side
   ✓ Observe from Front

3. Side bends
Step 1: Standing Position - Front View

- head not straight or centered.
- difference in shoulder height.
- unequal distance between the arms and body.
- Differences in the length of arms.
- Uneven waist creases.
- uneven hip heights.
- leg length difference.
Step 2: Standing Position- Side View

- Accentuated round back.
- Accentuated swayback.
Step 3: Standing Position- Back View

- head not straight or centered.
- difference in shoulder height.
- Uneven shoulder blades (scapulae)
- unequal distance between the arms and body.
- Differences in the length of arms.
- Uneven waist creases.
- uneven hip heights.
- lateral curvature of the spine.
- leg length difference.
Step 4 : Adam’s Bending Technique

- student puts chin to chest.
- Hands together.
- Arms outstretched with straight elbows.
- Bend forward at waist (90 degrees).
Step 5: Bending Position- Back View

Look For:

- Rib prominence (one side is higher than the other).
- Lumbar Prominence.
- Differences in height of hip crests.
Step 6: Bending position - Side View

Look for exaggerated rounding of the back

Kyphosis
Step 7: Bending Position- Front View

- Head not directly over the feet (twisting to one side).
- Is one side of torso more rounded than the other?
- Look for lumbar prominence.
Step 8: Side Bends

Ask the student to bend at the waist to each side

Look for S curvatures
Results

• Screening is subjective  Trust your observations

• When in doubt ask for another opinion or mark YES

• Be sure to mark either YES or NO and sign initials

• Mark each student’s form before moving on to the next student

<table>
<thead>
<tr>
<th>Screening Results:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoliosis</td>
</tr>
<tr>
<td>___</td>
</tr>
</tbody>
</table>

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Final Thoughts

No student can be screened unless there is a signed permission form in hand.

Parents cannot give verbal or phone permission

Students cannot sign for parents

Screen at your own pace

Screening is subjective. When in doubt ask for a second opinion or mark Yes.

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Reference


