Texas Risk Assessment for Type 2 Diabetes in Children
Introduction

- The Texas Risk Assessment for Type 2 Diabetes in Children (TRAT2DC) is a legislative mandated program developed, coordinated, and administrated by The University of Texas Pan-American Border Health Office.

- The program assesses children who may be at high risk to develop type 2 diabetes in Education Service Center Regions 1, 2, 3, 4, 10, 11, 13, 15, 18, 19, and 20, impacting 1.1 million children yearly.
Introduction

- During vision/hearing and scoliosis screenings of 1st, 3rd, 5th, 7th, and 9th graders in public and private schools, certified individuals assess children for the acanthosis nigricans (AN) marker.

- Children who are identified with the AN marker undergo additional assessments of body mass index (BMI), BMI percentile, and blood pressure.
The TRAT2DC program educates, trains, and certifies school nurses, or other individuals who are qualified to become proficient in conducting these assessments.

Along with conducting the risk assessment, school nurses are also a valuable resource because they can provide parents with additional information about the health risks associated with type 2 diabetes, develop an action plan for behavior change, and connect the family to medical care in the community.
ICD-9 Code 701.2 Acquired AN Member Claims Among Children 0-17 Years Old

Source: Texas Medicaid SFY 1999-2007, Texas Health and Human Services
Impact of Program

Midland ISD Steps Program

- To help reduce childhood obesity among students in Midland ISD through a 12-week walking program

- Goal: 16,028,000 steps

- 9,918 participants (included students, parents, teachers and community members)
Impact of Program

Laredo ISD

- Utilize the outcomes from the Risk Factor Electronic System (RFES) to combat childhood obesity
- Provide intervention programs for students identified with AN and a high BMI
- LISD school board increased physical activity by 15 minutes each day for elementary and middle school students
Impact of Program

Laredo ISD

- Collaborated with Gateway Community Health Center in which the center provides a family-based weight management program

Focuses on:
- Healthy eating
- Active living
- Self esteem
Texas Risk Assessment for Type 2 Diabetes in Children

History of Program

House Bill 1860 (1999)
House Bill 2989 (2001)
House Bill 2721 (2003 & 2005)
Senate Bill 415 (2007)
Risk Assessment Process
During vision/hearing and scoliosis screenings of 1st, 3rd, 5th, 7th and 9th graders in public and private schools, certified individuals assess children for the AN marker, a skin condition that signals high insulin levels.

Children who are identified with the AN marker undergo additional assessments of BMI, BMI percentile, and blood pressure.

Certified individuals make medical referrals for children with AN, which include BMI, BMI percentile, and blood pressure.
Risk assessment referrals are issued to the parents of these children, alerting each parent of their child's risk factors and encouraging further evaluation from a health professional.

Becoming aware of and understanding what the risk factors suggest can stimulate the changes necessary to prevent or delay future health problems for children at risk of developing type 2 diabetes and other conditions.
The TRAT2DC is under the Texas Health and Safety Code Sections 95.002, 95.003 and 95.004

For more information:
http://tlo2.tlc.state.tx.us/statutes/hs.toc.htm
The TRAT2DC is in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA) Privacy Rule under the following sections:

- § 164.512 Uses and disclosures for which an authorization or opportunity to agree or object is not required
  - A covered entity may use or disclose protected health information to the extent that such use or disclosure is required by law and the use or disclosure complies with and is limited to the relevant requirements of such law.
  - (i) A public health authority that is authorized by law to collect or receive such information for the purpose of preventing or controlling disease, injury, or disability

For more information:
http://www.hhs.gov/ocr/privacy/hipaa/understanding/index.html
Acanthosis Nigricans (AN)

- AN is a cutaneous marker associated with hyperinsulinemia and insulin resistance and is considered a risk factor for type 2 diabetes and other chronic diseases.

- Because of the increasingly alarming rates of children developing type 2 diabetes, AN assessments are important and can help identify children with high insulin levels who may be at risk for developing the disease.

- Children who are identified with the AN marker undergo additional assessments of body mass index (BMI), BMI percentile, and blood pressure.
Defining Acanthosis Nigricans

- Brown to black, rough or velvety marker
- AN is most frequently seen on neck, but may also be found in the axillae, abdomen, elbows, knees, or soles of feet
Defining Acanthosis Nigricans

- AN results from hyperinsulinemia, a compensatory result of insulin resistance, creating the risk for pancreatic exhaustion
- Strong relationship between hyperinsulinemia and obesity, including other conditions
Defining Acanthosis Nigricans

- Term coined by dermatologist, Paul Gerson Unna in 1889
- Assessing for AN is performed by visually examining and palpating the marker
Significance of Acanthosis Nigricans

Over the years studies have shown:

- AN has been found to be a significant finding in overweight African-American and Hispanic youth
- AN can be used to rapidly identify those patients with multiple risk factors for type 2 diabetes
- Detection of AN may also enhance patient and clinician receptivity to discussing risk reduction
- Using AN status in addition to BMI as a selection criteria appears as reliable means for initial screening to reduce the incidence of cardiovascular disease and type 2 diabetes
Children with Acanthosis Nigricans

Once a child is identified with AN, the following assessments are conducted:

- Body Mass Index (BMI)
- Blood pressure (BP)
Body Mass Index (BMI)

- BMI is a measurement that helps determine overweight status by using a mathematical formula that takes into account a child’s height and weight.

- After BMI is calculated for children and adolescents with AN, the BMI number is plotted on Centers for Disease Control and Prevention (CDC) BMI-for-age growth charts.
Defining Children’s BMI

Obesity: BMI ≥ to 95 percentile

- A child with a BMI equal or greater to the 95th percentile should undergo an in-depth medical assessment. Use of this percentile identifies children who will have a greater chance of maintaining obesity into adulthood. This is also significant as studies have shown that BMI above the 95th percentile is associated with elevated blood pressure, hyperlipidemia, and obesity-related disease and mortality.

Defining Children’s BMI

Overweight: BMI 85th to 94th percentile

- A child whose BMI falls at the 85th to the 94th percentile should be evaluated carefully and should be given particular attention to secondary complications of obesity.

Procedure to measure height:

1. Before you begin, ask child to remove shoes, hat, and bulky clothes.

2. Direct the child to stand erect with shoulders level, hands at sides, thighs together, and weight evenly distributed on both feet.
Guidelines for Collecting Heights

**Procedure to measure height:**

3. Ask the child to adjust the angle of his/her head by moving the chin up or down in order to align head into the Frankfort Plane.

4. Ask child to maintain his/her position.

5. Record height to the nearest 1/8th inch.
Guidelines for Collecting Weights

Procedure to measure weight:
1. Ask child to remove outer clothing and shoes.
2. Place the scale in the “zero” position before the child steps on the scale.
3. Ask the child to stand still with both feet in the center of the platform.
4. Record the measurement to the nearest ¼ lbs.
BMI Categories for Children

- **Obesity**
  - (BMI ≥ 95 percentile)

- **Overweight**
  - (BMI 85th to 94th percentile)

- **Normal Weight**
  - (BMI 5th to 84th percentile)

- **Underweight**
  - (Less than the 5th percentile)

CDC Congressional Testimony on new definitions of Body Mass Index Categories, September 2008

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BMI Examples

10 year old Boy
- Weight: 100 lbs
- Height: 56.25 in
- BMI = 22.25
- BMI Level: *Obesity*

10 year old Girl
- Weight: 100 lbs
- Height: 56.25 in
- BMI = 22.25
- BMI Level: *Overweight*
Hypertension increases the risk for cardiovascular disease and is a complication of obesity.

Hypertension has also been associated with insulin resistance and hyperinsulinemia.

Elevated blood pressure in childhood correlates with hypertension in early adulthood, supporting the need to track blood pressure in children.
BP Measurement Guidelines

- Correct measurement requires appropriate size cuff
- Right arm is preferred for consistency
- Blood pressure should be recorded twice
- Measure in controlled environment after 3-5 minutes of rest

BP Categories for Children

- Child’s age and height percentile is used to determine systolic and diastolic pressures

- Hypertension (H) ≥ 95th percentile
- Pre-hypertension (PH) 90th to < 95th percentile
- Normal (N) < 90th percentile

BP Examples

10 year old Boy
- Height: 56.25 in
- 1st BP reading: 116/78
- 2nd BP reading: 117/80
- BP Average: 116.5/79
- BP Category: Pre-hypertensive

10 year old Girl
- Height: 56.25 in
- 1st BP reading: 116/78
- 2nd BP reading: 117/80
- BP Average: 116.5/79
- BP Category: Hypertensive
Reporting

The following is recorded into the RFES, https://rfes.utpa.edu

- Date of birth (age)
- Sex
- Race/Ethnicity
- Weight (lbs.)
- Height (in.)
- AN present (yes or no)
- Two BP readings
- Seen by a physician (yes or no)
- Received treatment (yes or no)

Submit information by March 31, of current year
### Children’s Blood Pressure (BP) Categories

- Use tables adjusted for heights and weight for boys and girls
- Use child’s age and height percentile to determine systolic and diastolic pressures

#### Age/Height Adjusted BP table

**Table:** Blood Pressure for Boys by Age and Height Percentile

<table>
<thead>
<tr>
<th>AGE</th>
<th>BP%-%ile</th>
<th>Systolic BP by height %-%ile</th>
<th>Diastolic BP by height %-%ile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5% 10% 25% 50% 75% 90% 95%</td>
<td>5% 10% 25% 50% 75% 90% 95%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>58 59 60 61 61 62 63</td>
<td>73 73 74 75 76 77 78</td>
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<td></td>
<td>95th</td>
<td>115 116 117 119 121 122 123</td>
<td></td>
</tr>
<tr>
<td></td>
<td>99th</td>
<td>122 123 125 127 128 130 130</td>
<td></td>
</tr>
</tbody>
</table>

**Result:** Child’s Systolic and Diastolic BP are hypertensive because both fall above the 95th percentile --
Certified individuals make medical referrals for children with AN, which include BMI, BMI percentile, and blood pressure.

Risk assessment referrals are issued to the parents of these children, alerting each parent of their child's risk factors and encouraging further evaluation from a health professional.

Becoming aware of and understanding what the risk factors suggest can stimulate the changes necessary to prevent or delay future health problems for children at risk of developing type 2 diabetes and other conditions.
Referral Letter

The referral letter must include:

- Process of the risk assessment
- Reasons the individual was identified
- The risks associated with type 2 diabetes
- Statement concerning an individual’s or family’s need for further evaluation for type 2 diabetes and related conditions
The referral letter must include:

- Instructions to help the individual or family receive evaluation by physician or health care provider

- Information on procedures for applying for the state child health plan program and the state Medicaid program
Referral Materials

Sample Referral Letter

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BMI Chart

Body mass index-for-age percentiles: Boys, 2 to 20 years
Fact Sheet Provides:

- Total number of students assessed
- Total number of students with AN
- BMI of students with AN
- BP of students with AN

To find facts sheets, please visit our website at https://rfes.utpa.edu
Fact Sheet

Fact Sheet Provides:

- Number of students referred
- Number of students seen by physician
- Percentage of students on free/reduced lunch

To find facts sheets, please visit our website at https://rfes.utpa.edu
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Fact Sheet

- Number of Students with AN by Grade:
  - 1st Grade: 84
  - 3rd Grade: 181
  - 5th Grade: 254
  - 7th Grade: 235
  - Other Grades: 84

- Blood Pressure of Students With AN:
  - Hypertensive: 40%
  - Pre-Hypertensive: 44%
  - Normal: 16%

- BMI of Students with AN:
  - Normal: 721
  - Obese: 30
  - Overweight: 55
  - Underweight: 4

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Risk Factor Electronic System (RFES)
Texas Risk Assessment for Type 2 Diabetes in Children

Record/Report
- Enter assigned username and password
- Enter the risk assessment information for each child with AN

https://rfes.utpa.edu

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Annual Fact Sheet: Region 10

Number of Students with AN by Grade

Blood Pressure of Students With AN

Blood Pressure of Students With AN

Body Mass Index

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