Diabetes Prevention and Control in Children and Youth: How do We Navigate?

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Pediatric Type 2 Diabetes and Obesity in Japan

4 fold rise in 6-15 year olds, 80% of diabetes in Japan is now type 2

Increase in Incident Cases of Type 2 DM

8-45% of new onset cases of diabetes
10-fold increase in incident cases

Fagot-Campagna et al., J Pediatr 136:664-672, 2000
Prevalence of DM in Youth Age, Race/Ethnicity and DM Type

Source: Pediatrics 118:1510-18, 2006
The Types of Diabetes in the Young: The Overlap

Type 1 diabetes

Childhood obesity

Monogenic Diabetes

Type 2

Diabetes + Syndromes

Secondary Diabetes
Now Available from the National Diabetes Education Program (NDEP), a partnership of the NIH, the CDC, and more than 200 partner organizations

www.YourDiabetesInfo.org/media/Youth_NDEPSchoolGuide.pdf
Team Approach

Effective diabetes management, using a team approach, is critical for the following reasons:

• For the immediate safety of students with diabetes
• For the long-term health of students with diabetes
• To ensure that students with diabetes are ready to learn and have equal access to all educational opportunities
• To minimize the possibility that diabetes-related emergencies will disrupt classroom activities
Contents of the School Guide

• Diabetes Primer for School Personnel
• Actions for School Personnel, Parents/Guardians, and Students with Diabetes
• Tools for Effective Diabetes Management
• School Responsibilities Under Federal Laws
• Resources
• Glossary of Diabetes Terms
• Bibliography
### Average Ages for Diabetes Related Skills (years)

<table>
<thead>
<tr>
<th>Skill</th>
<th>Average Age</th>
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</thead>
<tbody>
<tr>
<td><strong>Hypoglycemia:</strong></td>
<td></td>
</tr>
<tr>
<td>Recognizes &amp; treats</td>
<td>4-9</td>
</tr>
<tr>
<td>Able to treat</td>
<td>6-10</td>
</tr>
<tr>
<td>Anticipates/prevents</td>
<td>9-13</td>
</tr>
<tr>
<td><strong>Blood glucose testing (by meter):</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7-11</td>
</tr>
<tr>
<td><strong>Insulin injection:</strong></td>
<td></td>
</tr>
<tr>
<td>Gives to self (at least sometimes)</td>
<td>8-11</td>
</tr>
<tr>
<td>Draws 2 insulins</td>
<td>8-12</td>
</tr>
<tr>
<td>Able to adjust doses</td>
<td>12-16</td>
</tr>
</tbody>
</table>
Average Ages for Diabetes Related Skills (years)

Diet:

- Identifies appropriate pre-exercise snack: 10-13 years
- States role of diet in care: 9-5 years
- Able to alter food in relation to blood glucose level: 10-15 years
Transitions: The Need

• Transition stage can be challenging
• Diabetes complicates emotional & social challenges
• Transition resources can:
  – strengthen relationships between young adults & adult care teams
  – assist with a smoother transition
Transitions: Key Challenges

• Youth/young adults:
  – Loss of health insurance
  – Less confidence in the new adult care team
  – Turning points

• Families:
  – Lack of understanding of the critical transition issues
  – Lack of planning
  – Unable to “let go”

• Adult care professionals:
  – Lack of interaction & follow-up between HCPs & young adult
  – Inadequate transfer of medical records
  – Issues related to interim care during the 2 to 3 months when the young adult is transitioning
Transitions: Online Tool
www.YourDiabetesInfo.org/transitions
The Types of Diabetes in the Young: The Overlap

Type 1 diabetes

Type 2 diabetes

Childhood Obesity

Monogenic Diabetes

Diabetes + Syndromes

Secondary Diabetes
Fifteen Percent of US Adolescents\textsuperscript{a} Have Pre-Diabetes, According to NHANES 2005-06

\textsuperscript{a}Adolescents = 12-19 years of age.
IFG = impaired fasting glucose (100-125 mg/dL).
IGT = impaired glucose tolerance (2-h OGTT 140-199 mg/dL).
Pre-diabetes = IFG and/or IGT.

Progression From Pre-diabetes to Diabetes in Adolescents

OGTT in 117 obese children and adolescents

At T=0:
- 33 (84%) had IGT

At 2 years:
- 8 IGT subjects developed T2D (24.2%)
- 15 IGT subjects reverted to NGT (45.5%)
- 10 IGT subjects remained IGT (30.3%)

**Best predictors of development of T2D:**
- Severe obesity (BMI ≥ 97th percentile) and persistent weight gain
- African-American race

SEARCH
(Prevalence of CVD Risk Factors in Children and Youth with DM)

- Prevalence of 2 CVD risk factors – 21%
- 7% in children 3-9 years
- 25% in children 10-19 years (p<0.0001)
- Girls – 23%, Boys 19% (p=0.04)

- 68% AI, 37% Asian, 32% AA, 35% Hispanics, 16% Whites (p<0.0001)
- At least 2 risk factors – 92% of type 2, 14% of type 1 (p<0.0001)
- Age, race/ethnicity, diabetes type independently associated with odds of having 2 CVD risk factors

Diabetes Care 29;1891,2006
Prevalence of Elevated CVD Risk Factors Among US 3-to-6 Year Olds with a BMI > 95th Percentile for Age and Sex

Girls

Boys

Obesity Increases Cardiovascular Risk Factors* in Children 5-17 Years Old

*Hypertension, high plasma insulin, abnormal total cholesterol, LDL, HDL, or triglyceride.

The Growing Problem of Diabetes in Our Children and Youth Predicts a Growing Burden of CVD with all its Attendant Morbidity and Mortality

The Growing Problem of Diabetes in Our Children and Youth is Being Driven Overwhelmingly by the Growing Epidemic of Obesity---the most Powerful non-Genetic Risk Factor for Development of Type 2 Diabetes---We are Faced with the Challenge of Navigating the Obesity Epidemic in Order to Stem the Diabetes Epidemic!
Treating T2DM in the Young is Difficult: What to Teach?

• Basics of disease process
  – Obesity → Insulin resistance → Pre-diabetes → Diabetes

• Lifestyle management
  – Nutrition and weight management
  – Exercise
  – Risk factor reduction/avoidance

• Basics of meds
  – Proper administration
  – Safety measures

• Control vs. Complications

• Coping

Paula Jameson
ARNP MSN CDE
There is Urgency for Diabetes Prevention in the Young---New! Bilingual Tip Sheet Series
The Obesity Epidemic

• An unintended consequence of economic, social and technological changes
  – Food supply is low in cost, abundant, palatable, and high in caloric density
  – Labor saving technologies have virtually eliminated requirements for physical activity as a part of everyday life
Multiple risk exposure is a growing problem in the obese young

- 58% of overweight children have ≥1 CV risk factor
- 39% of obese and 50% of severely obese children are at risk for diabetes and CVD

JUST WHAT HAS GONE WRONG IN THIS PICTURE----HOW HAVE WE LOST THIS KID?

- Who decided on the nature of his snacks?
- Why is he inside and sedentary in daylight?
- Who decided on the size of the servings?
- What is the caloric composition in the snacks?
- Where are his parents?
- What messages is he getting from the television?
- How will his decision-making toward food evolve?
Figure 5.2: The full obesity system map with thematic clusters (see main text 5.1.2 for discussion). Variables are represented by boxes, positive causal relationships are represented by solid arrows and negative relationships by dotted lines. The central engine is highlighted in orange at the centre of the map.

Map 5
Full Generic Map
Thematic Clusters (filled)

- Marketing to children
- Agricultural policies
- Food away from home
- Breastfeeding
- Stress
- Physical Education
- Transportation systems

Obesity-Associated Illnesses That Occur in Childhood

- Idiopathic intracranial hypertension
- Pulmonary disorders
  - Obstructive sleep apnea
  - Hypoventilation syndrome
- Hypertension
- Hypercholesterolemia
- Proteinuria
- Nonalcoholic fatty liver disease
- Gallbladder disease
- *Type 2 diabetes mellitus*
- Polycystic ovarian syndrome
- Orthopedic
  - Blount’s disease
  - Slipped capital femoral epiphysis
- Skin
  - Acanthosis nigricans
  - Striae
Prevalence of Overweight Children and Adolescents in the USA is Increasing

Prevalence of Overweight Children Among Racial-Ethnic Groups

![Bar chart showing the prevalence of overweight children among different racial-ethnic groups over different years.](chart_image)

- **Caucasian**: 1986, 1992, 1998

*Strauss and Pollack. JAMA 2001;286:2845.*
Changes in Dietary Patterns That May Contribute to Obesity in Children

- Calories from Snacks (1977-1996)
- Meals Away from Home (1977-1995)

Morton and Guthrie. *Fam Econ Nutr Rev* 1998;11:44.
Changing Portion Sizes

1954
Burger King
2.8 oz
202 calories
4.3 oz
310 calories

1955
McDonald’s
2.4 oz
210 calories
7 oz
610 calories

1900
Hershey’s
2 oz
297 calories
7 oz
1,000 calories

1916
Coca-Cola
6.5 fluid oz
79 calories
16 fluid oz
194 calories

1950s
Movie popcorn
3 cups
174 calories
21 cups (buttered)
1,700 calories
CAN CURRENT OBESITY TRENDS IN THE U.S. BE CHANGED?

“The only way to really stay out of trouble is to avoid it”

_My Daddy, 1955_
Preventing Childhood Obesity: Health in the Balance (IOM, 2005)

- Immediate steps for confronting the epidemic:
  - **Federal Government**:
    - Establish an interdepartmental task force and coordinate federal actions
    - Develop nutrition standards for foods and beverages sold in schools
    - Fund state-based nutrition and physical-activity grants with strong evaluation components
    - Develop guidelines regarding advertising and marketing to children and youth by convening a national conference
    - Expand funding for prevention intervention research, experimental behavioral research, and community-based population research; strengthen support for surveillance, monitoring, and evaluation efforts
  - **Industry and Media**:
    - Develop healthier food and beverage product and packaging innovations
    - Expand consumer nutrition information
    - Provide clear and consistent media messages
  - **State and Local Governments**:
    - Expand and promote opportunities for physical activity in the community through changes to ordinances, capital improvement programs, and other planning practices
    - Work with communities to support partnerships and networks that expand the availability of and access to healthful foods

Groundswell of Prevention Activities
Early Childhood 2010: Innovations for the Next Generation—in our “War” against child obesity and overweight

Topics:

- Obesity Prevention including Let’s Move—Michelle Obama’s initiative to prevent obesity- www.letsmove.gov
- Home Visiting
- Quality Child Care
- Healthy Workforce/Professional Development
- Early Identification of development issues
Partnerships Needed to Implement Comprehensive Childhood Prevention Program

**Comprehensive Reduction in Childhood Obesity**

- Entertainment & Sports Industry
- Major Sports Franchises
- Worksites & Schools
- Media, Communications
- Non-Traditional Partners
- Food Industry
- Providers & Hospitals
- Community Groups
- Urban Planners, Developers, Architects
Walter Sanders
Berlin Airlift, 1948
“Prosecution of war requires complex logistics and coordination”
U.S. Army Archives
Conf of the Big 3, Churchill, Roosevelt, and Stalin, 1945
“To win wars it often requires alliances and coalitions”
JUST HOW DO THE “WARS” ON TOBACCO AND OBESITY COMPARE IN THE MOST IMPORTANT AREAS?

- Note that the very elements that were most powerful in facilitating a “war” on tobacco are distinctly absent in the obesity epidemic!
The newly-formed **Partnership for a Healthier America Foundation** strives to support the five pillars of the First Lady’s *Let’s Move* Initiative:

1. Offering parents the tools and information they need—and that they’ve been asking for—to make healthy choices for their kids.
3. Getting healthier food into our nation’s schools.
4. Ensuring that all our families have access to healthy, affordable food in their communities.
5. Increasing opportunities for kids to be physically active, both in and out of school.
Vision

To serve as a nonpartisan catalyst to link and mobilize the private sector, foundations, thought leaders, media, and communities around the specific goals outlined in the First Lady’s Initiative to substantially reduce childhood obesity within a generation.

Mission

- The Partnership will serve as a nonpartisan convener across the private, non-profit and public sectors to accelerate existing efforts addressing childhood obesity and to facilitate commitments towards the First Lady’s national target of solving childhood obesity within a generation.

- Core activities will include:
  1. Developing a strong membership network of leaders across sectors with commitment to scaling meaningful and measurable solutions.
  2. Convening members annually to affirm, align and announce commitments.
  3. Promoting broad understanding among all sectors about the role healthy food, physical activity and the environment play in reversing the childhood obesity epidemic.
  4. Facilitating and measuring the impact of members’ commitments against clear and transparent targets.
  5. Connecting potential partners in the private and non-profit sectors to each other and to the correct points of contact in government to ensure efficient leveraging of actions, sharing of knowledge and lessons learned both at the community, state and national levels.
"NEW PARTNERSHIP"

Alert stakeholders

PHA board review & approval

Negotiation of terms of agreement

Input from Founder's Council; others

PHA Strategic Working Group vetting and review

Advisory input; consultation

Engagement of PHA CEO/staff with WH staff

Discussions with WH staff

Interested Party seeks to Play a Role in the Reduction or Elimination of Child Obesity

General scheme of interaction with WH staff around partnership negotiation
### Application
- President / Board invite industry leaders to pledge a commitment
- Interested parties reach out to Foundation with pledges

### Negotiation
- Board evaluates based on sector-specific criteria (TBD) and signs MOU with member
- Accepted applicants offered one-year membership, conditional on upholding terms of MOU

### Review
- Members report progress against target metrics to Foundation
- Applicants failing to meet targets or advance their commitment may lose membership (and co-branding)

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**Contents of Partner MOU**

- Statement of the member commitment in measurable terms as established by industry standards (e.g., reduce sugar content consumed by 5%)
- Alignment on metrics and timeline used to track the member commitment (e.g., percent and volume of product sold with reduced sugar content)
- Agreement to share data needed to track commitments
- Agreement on public release of data in Annual Data Report
- Standard legal framework and Partnership rules, such as co-branding rights

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* President and Board to be final determinants of tier criteria and membership approval
## Model for Membership

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<th>Tiered</th>
<th>Substantial</th>
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| - Program staff must invite new members with Board approval  
- Restricted to senior leaders (e.g., C-level executives, political leaders) |
| - Partners: enter into formal MOU under sector-specific criteria and agree to be tracked against transparent performance metrics  
- Sponsors: make substantive pledges to support the goals of the First Lady’s initiative and targets (approved at Board discretion) |
| - Commitments must substantially progress First Lady’s goals  
- Commitments must address member’s direct impact on obesity challenge (when possible)  
- Evaluated based on agreed performance metrics |

## Core Principles

- Make goals and drive for commitment applicable to all industries and sectors at all levels of society
- Facilitate commitments that match private funding to meaningful and scalable community and government programs
- Maintain a manageable and influential group of dedicated members to support strategy and implementation
CURRENT INITIATIVES IN PROGRESS THROUGH PHA EFFORTS

- Healthy Weight Commitment Foundation pledge to reduce 1.5 trillion calories
- PSAs by Senate wives through NAB
- “Chef’s Move” initiative with 1000 public schools
- Salad Bar initiative at 1000 schools
- Walmart negotiations regarding “healthy foods”
- Walgreen’s “Fresh Food” Initiative
- Darden Restaurants with menu changes
Carl Mydans
USS Missouri, 1945
Sometimes it’s a long time before it’s over!
Alfred Eisenstaedt
Times Square, 1945
“Victory is sweet”
Joe Rosenthal
Iwo Jima, 1945
“It’s especially good when we can celebrate victory together, for the good of all”
The Ominous Legacy of Obesity: Not the Future We Desire for Our Children! To Navigate the Problem of Diabetes, we must stem obesity!

- Pulmonary Disease
  - Abnormal function
  - Obstructive sleep apnea
  - Hypoventilation syndrome

- Nonalcoholic Fatty Liver Disease
  - Steatosis
  - Steatohepatitis
  - Cirrhosis

- Gall Bladder Disease

- Gynecologic Abnormalities
  - Abnormal menses
  - Infertility
  - Polycystic ovarian syndrome

- Osteoarthritis

- Skin

- Gout

- Phlebitis
  - Venous stasis

- Idiopathic Intracranial Hypertension
- Stroke
- Cataracts
- Coronary Heart Disease
  - Diabetes
  - Dyslipidemia
  - Hypertension
- Severe Pancreatitis
- Cancer
  - Breast, uterus, cervix, colon, esophagus, pancreas, kidney, prostate
- Osteoarthritis
Diabetes Prevention and Control in Children and Youth: How do We Navigate?

- We must recognize it as a growing and serious problem among our children and youth.
- For type 1 diabetes, still the most common form, a variety of help is available.
- Much-needed attention is now being paid to the periods of transition.
- For type 2 diabetes, the fastest-growing form, the major driver is obesity, and it is on obesity that we must declare war in order to effectively stem the diabetes epidemic.