KEEPING STUDENTS HEALTHY:
Promoting physical activity and healthy eating
in NH and VT schools.

CHILDHOOD OBESITY

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May 8, 2009
A true epidemic…

- In last 2 decades, prevalence of obesity has more than doubled in 6-12 year olds and more than tripled in adolescents.*

*Ogden et al, JAMA.2002:288(14):1728-1732
A true epidemic...

- Data from the **2003-2004 NHANES** published in April 2006 by Ogden et al* show:
  - 17.1% of US children (6-19 yo) are obese with BMI >95%.
  - Obesity increased from 13.8% to 16% in girls and from 14% to 18.2% in boys since the 1999-2002 survey.
  - Additional 16.5% of children (6-19 yo) are overweight with BMI between 85-95%.
  - Total overweight and obese children = 33.6%.

*JAMA. April 5, 2006;295(13):1549-1555
Even among children ages 2-5 yo, 26% are overweight or obese with 14% being obese.

Additionally, these data show that 70% of adults are overweight (BMI ≥ 25) or obese (BMI ≥ 30) with 5% qualifying as morbidly obese (BMI ≥ 40).

*JAMA. April 5, 2006;295(13):1549-1555*
UPDATE!

November 28, 2007 CDC News Release:

- For the 1st time in 25 years, the latest NHANES Data from 2005-2006 show no significant increase in obesity prevalence for either men or women
  - 2003-2004: 31.1% men obese, 33.2% women obese
  - 2005-2006: 33.3% men obese, 35.3% women obese
- No statistically significant increase.
May 2008: Ogden, et al reported in JAMA*
No statistically significant increase in BMIs for children ages 2-19 between the 2003-04 and 2005-06 NHANES surveys.

*JAMA 2008:299(20):2391-2400
U.S. Childhood Overweight and Obesity National Trends

*Obesity Rates Quadrupled in 6-11 yr olds over 40 years*

Troiano RP, 1995; Ogden CL, 2006
Data released on Sept. 27, 2006 by the Foundation for Healthy Communities:

Review of 1,453 medical charts of children ages 6-12 all across NH show:

- **32.8% of children 6-12 are overweight or obese**
  - 13.3% of girls 6-12 are obese
  - 19.9% of boys 6-12 are obese
Trust for America’s Health Report - 2008

- UT - 8% childhood obesity = 50/50
- VT - 11% childhood obesity = 43/50
- RI - 12% childhood obesity = 42/50
- CT - 12% childhood obesity = 37/50
- ME - 13% childhood obesity = 34/50
- NH - 13% childhood obesity = 33/50
- MA - 14% childhood obesity = 27/50
- DC - 23% childhood obesity = 1/50
Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs. overweight for 5’4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1986
(*BMI ≥30, or ~30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1987

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1988
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1989

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~30 lbs. overweight for 5’4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1991
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1992

(*BMI \geq 30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1993

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1994

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1995

(*BMI ≥30, or ~30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1996
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1997

(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1998
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1999
(*BMI $\geq 30$, or ~ 30 lbs. overweight for 5’ 4” person)

No Data          <10%           10%–14% 15%–19%  $\geq 20%$
Obesity Trends* Among U.S. Adults

BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2001

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2002

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2003

(*BMI \geq 30, or \approx 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2004

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2005

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2006

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2007
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Defining Obesity

- **BMI** = \(\frac{\text{wt in lbs}}{\text{ht}^2 \text{ in inches}} \times 703\) (calculate and plot on chart)

For children:
- \(\text{BMI} \geq 85^{\text{th}}\) to \(95^{\text{th}}\)% for age = **overweight**
- \(\geq 95^{\text{th}}\)% for age = **obese**
- \(\geq 97\)% for age = **severe obesity**

For adults:
- **BMI** \(\geq 25\) = overweight
  - **BMI** \(\geq 30\) = obese,
  - **BMI** \(\geq 40\) = morbidly obese
Why BMI?

- Estimates body fat content more accurately than weight for age
- Simple to calculate and follow
- Easier to use than skin caliper testing or measurement of hip to waist
- May overestimate body fat in athletes with increased muscle mass
- May underestimate body fat in elderly or others who have lost muscle mass
Fat for Life?
Six Million Kids Are Seriously Overweight. What Families Can Do.
By Geoffrey Cowley & Sharon Begley
If you grow up to be half the man your father is, that's plenty."
Do obese kids = obese adults?

- Chance of obese child becoming obese adult increases from 20% at age 4 to 80% by adolescence.*
- Obese adults who were obese as children have higher BMIs than obese adults who were normal weight as children.**

*Whitaker et al: NEJM. 1997;337:869-873
**Schwarzndberg S, MinnMed. 2005:62-66
Complications of Obesity

- **Cardiovascular Disease**
  - Dyslipidemias
    - AS changes by age 2 (Bogalusa Heart Study)
    - AHA meeting 11/08 - Dr. Raghuveer - studied 70 children with obesity/cholesterol disorders had comparable carotid a. thickening to 45 yo
  - Hypertension – nearly ½ of obese kids are hypertensive or prehypertensive
- **Metabolic Syndrome**
Complications continued...

- **Orthopedic problems**
  - Slipped Capital Femoral Epiphysis
  - Genu Varum

- **Type 2 Diabetes Mellitus**
  - Insulin resistance
  - Hyperinsulinemia
  - Impaired Glucose tolerance
  - Metabolic Syndrome

- **GI Disorders**
  - Steatohepatitis
  - Gall bladder disease
Complications continued...

- Menstrual Irregularities/PCOS
- Psychological Disorders
  - Low Self-esteem
  - Depression
- Pseudotumor Cerebri
- Obstructive Sleep Apnea
- Increased incidence of Asthma
Complications in NH…

NGA report on Healthy Living 2006 (www.nga.org)

Trimming Waistlines = Healthier Americans
Due to the obesity epidemic, as many as 4,870 or 1 in 3 New Hampshire babies born in 2000 will develop diabetes during their lifetime.
Causes of Obesity

- **Basically**: Energy intake > Energy expenditure
- **Genetic Causes**:  
  - Adoptive studies show body weight ends up closer to biologic than adoptive parent  
  - Increased risk of obesity in children with obese parents  
  - Humans have evolved genes favoring energy storage
BUT...

Rate of obesity is increasing too rapidly to be due to variation in gene pool alone!
Environment

- Social/Lifestyle Changes:
  - Decreased family meals with 2 career and single parent families – assoc. with increased fast or convenient foods and decreased fruit/vegs
  - Decreased walking as increased auto use*
    - Walking has decreased by 40% in adults and by 60% in children since 1977.
  - Decreased playing outside due to increased traffic and crime.
  - Innovations lead to decreased activity:
    - Remotes, garage door openers, escalators, pcs., convenience foods,

*US Dept Transportation Bureau of Transportation Statistics, JNHTS 2001 Highlights report, BTS03-03
Walking the dog
Physical Inactivity

- PE in schools much reduced:
  - Daily PE in only: (AHA Shape of the Nation Report 2006)
    - 8% elementary schools
    - 6.4% middle schools
    - 5.8% high schools
    - Schools requiring PE in each grade dropped from 42% in 1991 to 28% in 2003
    - Only 1 state requires daily PE from K-12 (Illinois)
  - 20% boys and 25% girls (9-13) have no free time physical activity (CDC-YMCLS 2002)
  - 31% HS students get less than recommended physical activity (CDC-YRBS 2002)
Physical Inactivity cont...

- Fully *two-thirds* of US adults get *less than* the recommended amount of physical activity*.
- Fully *40%* of U.S. adults do not participate in any leisure-time physical activity.*
- In NH - *19.9%* adults have no physical activity (national average = 22%).**

* - National Center for Bicycling and Walking
** - Trust for America’s Health 2007
"Your lifestyle's too sedentary... You don't have a rash... It's moss."
Physical Inactivity continued…

- Federal Government now recommends \textit{1 hour} moderate physical activity/day for all children as well as adults
Television

Multiple studies show link with childhood obesity:

- Incidence of obesity is highest in children watching TV ≥ 4 hours/day*
- Incidence of obesity is lowest in children watching TV ≤ 1 hour/day*
- > 25% American kids watch > 4hrs/d**
- 6 month – 2 yo watch an average of 2 hrs/d**
- Several studies show that decreasing “media” use alone resulted in decreased BMI after 1 year

*Crespo et al: Arch Ped Adol Med, 155:360-365
**Pediatrics 2003; 112(2):424-430
Computers/VCRs/DVD players/video games are all increasingly used by younger children.

AAP Recommendation is to limit total screen time for children to <2 hrs/day.
“Can Johnny come out and eat?”
Diet-restaurants...

- Increased eating out: from 16 to 29% from 1977-1995*
- By mid 1990’s Americans eating 23 meals/month out with 8 of 23 from fast food restaurants*
- USDA survey in 1995 showed school age kids get >40% of calories out of home.

*USDA data from NCFS 1977-78 and CSFII 1994-95
Fast Food

- Has evolved from occasional treat to staple of American diet
- Americans now eat 28 lbs FF/year*
- On average, eat fast food 8X/mo
- **Supersizing** – increased calories by > 200 calories - now results in our consuming >80% rec. calories in 1 meal

20 Years Ago

210 Calories
2.4 ounces

Today

610 Calories
6.9 ounces

Calorie Difference: 400 Calories

How to burn* 400 calories:
Walk 2 hr 20 Minutes

*Based on 130 pound person
Cheeseburgers

20 Years Ago

333 calories

Today

590 calories

Calorie difference: 257 calories
Cookies

20 Years Ago

55 calories
1.5 inch
diameter

Today

275 calories
3.5 inch diameter

Calorie difference: 220 calories
Soda

- Consumption has increased by 300% in 20 years*
- 12 oz soda provides 10 tsp sugar and 150 kcal and 60% increased risk of obesity
- Serving sizes have increased from:*
  - 6.5 oz - 1950s
  - 12 oz - 1960s
  - 20 oz - 1990s

Soda Continued...

- 56-85% school kids drink at least 1/day*
- 20% adoles boys drink ≥ 4/day*
- Only 14% adols drink sugar free soda**
- Consumption displaces intake of milk:
  - In 1950’s boys drank twice as much and girls drank 50% more milk as soda
  - In 1990’s boys and girls drink twice as much soda as milk

*Gleason P et al. USDA, FNS, Office of Analysis, Nutr., Eval. 2004

**Harnack L. J Am Diet Assoc. 1999;99:436-441
May 2006...

President Clinton announces successful negotiations with major beverage companies.
School Lunches

- 1946 National School Lunch Act established to safeguard health of kids*
- Costs have grown from $70 mil to 6.4 bil by 2001*
- Typically high in sat fats, carbs and kcal.
- Guidelines:*  
  - <30% kcal from fat and <10% kcal from sat. fat
  - At least 1/3 of RDA of kcal. Protein, Vit A, Vit C, Iron and calcium

*USDA Food and Nutrition Srvc, NSLP fact sheet 2004
School Lunches

- NSLP supplemented by surplus agricultural stocks – (ie) – corn

- Vending Machines in Schools*
  - in 43% elem, 74% middle and nearly all high schools
  - NSLP requires they don’t operate in caf during school lunch – but poor enforcement
  - Dispense high “empty” kcal foods – child can consume 500-1000 kcals between classes

*CDC SHPPS 2000
The Center for Science in the Public Interest (CSPI)* evaluated all 50 states and DC regarding foods sold *OUTSIDE* of the school entrée, including a la carte items, food sold as fundraisers, at concession stands and at school stores and issued a School Food Report Card in June 2006.

5 Key Considerations:
- 1. Beverage nutrition standards.
- 2. Food nutrition standards
- 3. Grade levels to which policies apply
- 4. Time during school day policies apply
- 5. Locations on school campus to which policies apply
School Meals cont...

- Results: Kentucky A-
- 12 States B
- 15 States C or D
- 23 States (including NH) F
- Only 10 states have any school food and/or beverage nutrition standards that apply to the whole campus, for all grades for the entire school day.
- Even among those schools with the strongest nutrition policies, 82% have no sodium limits, 57% had no limits on sales of sports drinks and 86% had no limits on high fat milk intake for any age.
CSPI goes on to note that Federally subsidized school meals are required to meet nutritional standards set by Congress and the USDA. While the USDA has no authority to regulate foods sold outside of the cafeteria or outside of meal times, their policies addressing school meals do not address: *portion sizes (excess caloric consumption), trans fats, refined sugars and sodium*, all which have become increasingly problematic in children’s diets.
NH does not set standards for school meals to be higher than what USDA requires (22 states do)

NH does not set nutritional standards for foods sold in vending machines, a la carte, in school stores or bake sales (22 states do)

NH does not limit when and where these foods may be sold on school campus beyond USDA requirements. (26 states do)

NH does not require schools to screen for BMI (16 states do)
Tackling Obesity:

HONEY! LET'S SHRINK THE KIDS.
U.S. Childhood Overweight and Obesity National Trends

Reversal is the goal

6-11y

2003-2006 NHANES IV

2010

2020

2030

0

10

20

30

40
Prevention

- Of key importance as 90-95% of obese persons who lose weight, regain it.
- It is unclear if obesity prevention programs currently available are effective.
- Reducing sedentary behaviors appears to be more effective than dietary education.
Exercise for Prevention

- Multiple studies have shown physical activity is associated with a lowered risk of CVD, DM and death.
- Gregg et al studied 2,896 adults with DM and found walking at least 2 hrs/wk reduced mortality by 34-39% and walking 3-4 hrs/wk reduced mortality by 54%*
- Studies suggest that increased exercise (reducing sedentary behavior) could help reverse the obesity epidemic.

*Arch Int Med, 2003;163:1440-1447
Role of the Schools
(NH Childhood Obesity Task Force Recommendations)

**GENERAL RECOMMENDATIONS:**

- Measure/follow BMIs.
- Encourage faculty/staff to model healthy lifestyles.
- Provide community education for parents/administrators/staff/faculty/local officials, etc. on benefits of healthy eating and increased activity.
- Offer curriculum on healthy lifestyles and media literacy.
Healthy NH

Fruits and vegetables... more is better! Eat at least 5 servings a day. Limit 100% fruit juice.

Cut screen time to 2 hours or less a day.

Participate in at least one hour of physical activity every day.

Restrict soda and sugar-sweetened sports and fruit drinks. Instead, drink water and 3-4 servings a day of skim or 1% milk.
Role of Schools

**NUTRITION:**
- Improve nutritional content of school menus, a la carte items, vending machine items, school store and concession stand foods.
- Provide only skim and 1% milk or water for beverages. Avoid sweetened beverages (soda/sports drinks).
- Involve students in making dietary changes.
- Provide adequate time for students to eat meals.
- Provide training for food service staff.
- Partner with local organizations such as Farm to School Program.
Consider a school garden
Role of Schools

**PHYSICAL ACTIVITY:**
- Incorporate activity into classroom curriculums.
- Work with local school boards to increase PE requirements.
- Promote/teach lifelong activity skills (hiking, snowshoeing, etc) in addition to traditional sports.
- Implement walking programs during recess/PE or after school - map and mark a walking route.
- Hold regular bike/walk to school events - i.e. - walking school bus.
Role of Schools

**PHYSICAL ACTIVITY ~ CONTINUED:**

- Partner with local organizations/businesses to bring activities to schools - i.e. - karate or dance classes.
- Work with students to construct fitness trail on school grounds.
- Use older students to model/facilitate physical activities and earn community service credits.
- Allow school facilities to be used during non-school hours - (ie- gym, track).
- Help facilitate transportation to/from after school activities.
Since its launch, in Fall 2005, over 19,170 people have participated and have collectively walked 114,577 miles.

163 organizations have participated (many schools)
Coming: June 1~7, 2009

**WALK NH WEEK**

Anyone interested in organizing a community walk call 225-0900
School Meals – some good news

Making It Happen! School Nutrition Success Stories – tells the stories of 32 schools across the US from K-12 who have used innovative strategies to improve the nutritional quality of foods and beverages sold outside the Federal meal programs.*

*Joint project of the Food and Nutrition Program of the USDA, the CDC, HHS and US Dept. Ed.
Findings: Students will buy and consume healthful foods and beverages – AND – schools can make money.

Of the 17 school reporting income data, 12 increased their revenues and 4 reported no change.
School Meals – good news cont...

- Strategies employed were:
  - 1. Establish nutrition standards for competitive foods.
  - 2. Influence food and beverage contracts.
  - 3. Make more healthy foods/bevs available.
  - 4. Adopt marketing techniques to promote healthy foods.
  - 5. Limit student access to competitive foods.
  - 6. Use fundraising activities/rewards that support student health.
School Meals – good news cont...

- Foods promoted included:
  - Water, - fruit salads
  - 100% fruit juice - whole grain breads
  - Milk - bagels
  - Cheese - trail mix
  - Yogurt - granola bars
  - Fresh fruits and vegetables - air-popped popcorn
  - Veggies and dip
  - Vegetable salad
School Meals – good news cont...

- **Foods Excluded:**
  - candy
  - soft drinks
  - sweetened drinks
  - fried chips
  - deep-fried foods
  - snack cakes
A few examples…

1. Massachusetts  Shrewsbury School District:
   - The foodservice has been serving healthier options:
     - Replacing fried items with fresh food offerings
     - Substituting yogurt, bagels, fresh fruit, 100% fruit juice and milk for fatty chips
     - Closed the high school snack bar during lunch

Result: sales in the caf increased by $400/week
School Meals – good news cont...

2. **Maine School Union 106**
   - After much discussion and controversy over removing soda and low nutrition snacks from vending machines, whose profits benefit the Student Council, a compromise was reached when the principal agreed to leave the vending machines on all day if they were filled with healthy snacks and beverages.

   - **Result**: All high schools in the district report increased or unchanged revenues from the vending sales.
School Meals – good news cont...

California Vista High School, San Diego
- The school district changed from allowing privately owned vending machines to buying their own to place in the high school and to stock with healthy food and beverages such as granola bars, Oriental snack mix, salads, and tuna.
- Soda is still available but priced higher than water, juice or milk.

- Results: The machines gross $25,000/month, making $6,000/month in profit

- For more information on the Making It Happen stories Go to: “www.cdc.gov/healthyyouth/nutrition/making it happen/pdfr”
Summary

- For the first time in >25 years, epidemic Adult and Pediatric obesity prevalence may be stabilizing in the USA.
- Individuals, families, communities, public health organizations, schools, government, and medical professionals all must play a role to reverse this.
- Evidence exists that reducing sedentary behaviors and increasing activity can help reverse the obesity epidemic.
- Improving the nutritional quality of meals and providing increased opportunity for physical activity in the schools will help reverse childhood obesity.
QUESTIONS?