The Center for
Health and Health Care in Schools

School Nurses, School-Based Health Centers and Childhood Overweight

A report from a roundtable meeting to explore the role of school health professionals in preventing childhood overweight

Virginia Robinson
Julia Graham Lear
Nancy Eichner

August 2006

2121 K Street, NW, Suite 250, Washington, DC 20037
202-466-3396 fax: 202-466-3467 www.HealthInSchools.org

Acknowledgments

This report, *School Nurses, School-Based Health Centers and Childhood Overweight*, was produced with support from the Robert Wood Johnson Foundation. Special thanks to Terry Bazzarre, PhD, MS, senior program officer at the Robert Wood Johnson Foundation for his on-going encouragement and contributions to this project.

Table of Contents

SCHOOL NURSES, SCHOOL-BASED HEALTH CENTERS AND CHILDHOOD OVERWEIGHT

A report from a roundtable meeting to explore the role of school health professionals in preventing childhood overweight

Washington, DC, April 27-28, 2006

Are the increasing numbers of overweight children in our elementary and high schools evidence – like canaries in coal mines – that children's environment has become toxic and serious consequences lie ahead if action isn't taken soon? If so, can the schools, where children spend most of their waking hours, be part of that action? And more specifically, is there a role for medical personnel already present in many schools—nurses and school-based health centers – in preventing or treating overweight?

An Overview

A group of experts, including school nurses, administrators, and representatives of professional organizations that focus on school health issues, was convened by the Center for Health and Health Care in Schools at George Washington University and the Robert Wood Johnson Foundation to talk about the seriousness of child overweight and its potential for causing devastating illness and disability in childhood and later in adult life. The participants were awed by and respectful of the wide-ranging nature of health problems they were confronting and the diverse contexts in which health services are provided in schools. But they also saw examples that suggest schools can, given support and imagination, address the problem of childhood overweight directly and aggressively.

The Washington, D.C. meeting was part of an obesity initiative being mounted by the Robert Wood Johnson Foundation, which has identified childhood overweight and obesity as primary public health problems. Conference participants came from a range of perspectives, representing state and local school boards, pediatricians, school health project managers, spokespersons for parent groups and school nurses, state legislators, and veterans of early and ongoing efforts to educate public and professionals about the problems of overweight.

Some things seemed clear from the outset. Nothing will happen to stem the explosion of childhood overweight, participants agreed, unless health professionals can reach the hearts and minds of parents, school administrators, state legislators, and school board members.

There was no doubt in the minds of conference participants that overweight is the result of imbalance in the "calories in-calories out" equation, and that there are multiple social and economic reasons why American children increasingly eat more calories than they expend in physical activity. Family attitudes toward food, advertising aimed at children, serving sizes in fast food and restaurant meals, the

quality of food served in schools, cutbacks in recess and physical education in schools, and lack of concern about overweight on the part of medical professionals figure all in the picture and that many of these factors are beyond the reach of school health professionals.

But there was also notice of successes—school programs that have made a difference in attitudes towards overweight in children and have helped both children and adults to achieve unexpected weight losses. What are needed, one participant suggested, are "brilliantly packaged vignettes" of successful school programs that will help newcomers to the issue to "see themselves in the model." It does little good, conference participants agreed, to distribute colorful brochures touting healthful living and eating. More likely to be understood and remembered by both lay persons and professionals are engaging approaches such as video clips that make clear the role of school health professionals in promoting a healthy school environment and show how schools can help children and their families adopt healthful habits for eating and physical activity.

The conference found it useful first to identify the barriers that need to be overcome in introducing programs that promote healthy weight into schools, and then to recommend steps that can lead to successful and productive programs.

Barriers

Student health and academic performance. To begin with, the conference agreed that it is necessary to persuade school administrators, state legislators, and members of state and local boards of education that student health, including healthy weight, is a component of successful academic performance. The conference recognized that solid evidence to support this argument is lacking and urged that research continue to explore the relationship between student health and academic success, looking particularly at the possibility that health programs are cost-effective for schools in terms of improved attendance and academic performance.

Differing perspectives on the use of BMI measurement. Conference participants were told that schools *have* found it possible to reach parents with messages about their children's weight status and the need for action when they are given concrete evidence of actual health problems arising from their children's overweight. Although there is some growing evidence of successful efforts to include body mass index information in student health report cards, some participants questioned whether schools should administer BMI assessments and to what extent BMI results should be communicated to parents. These reservations reflected concern that BMI should *not* be reported if schools lack effective ways to refer children and their parents to resources that can help them achieve healthy body weights, and if schools do not have policies that promote access to healthful lower-calorie foods and do not provide opportunities for daily physical activity.

School staff attitudes and knowledge. There may also be barriers to good weight management practices within schools, in the form of resistance by teachers or administrators to the time required for health education, for example, or to changes in

school food options or opportunities for physical activity during the school day. The limited numbers of nurses available to schools, and concerns about whether school nurses have had adequate training in weight management science and practice were also seen as potential barriers.

Adverse consequences of focusing on obesity. Additional concerns worried about "stigmatizing" overweight children, leaving them open to teasing or harassment by fellow students. A few expressed concerns as to whether emphasizing weight in school might lead to eating disorders among students of normal size who might perceive themselves as overweight.

Lack of best practice treatment options. The absence of treatment options was cited as a significant barrier to implementing weight reduction programs. It was suggested that for schools to measure body mass index and then offer no programs or services for students whose measurements are in high-risk categories may be worse than not measuring body fat at all. However, it was also acknowledged that research reviews have not supported specific treatment interventions. There were also reports that pediatricians or other physicians have dismissed school findings of body mass index when parents have brought those results to doctors and asked for help with their children's weight problems. Physicians, including those at the conference, have noted that they are not reimbursed by health plans or other insurers for time spent in weight counseling.

Difficulty of replicating successful healthy-weight interventions. The United States is strongly committed to state/local control of education, and that leads to many differences among states, among school districts within states, and among schools in districts. This means that "one size will not fit all" in weight management. With schools varying in the programs they offer and the staff they have on site, it is difficult to replicate initiatives that have been successful under different circumstances.

Other barriers to successful school weight management programs include lack of opportunities to buy fresh fruits and vegetables in many urban communities; continued availability of soft drink and other high-calorie options in schools; intensive advertising of high-sugar foods to children; snacks and candy available to schoolchildren in shops and stores near schools; and little safe space for exercise in many neighborhoods.

Recommendations

The conference acknowledged that there will be wide diversity in the kinds of healthy weight promotion and management programs that appear in schools. But conferees agreed that some elements need to be present in all programs and suggested ways in which limited resources can be utilized to the best effect.

- ***Body Mass Index.*** Measuring body mass index (BMI) has surfaced as one technique for addressing childhood overweight. Some states such as Arkansas have enacted laws requiring BMI measurement of students in some or all grade

levels K - 12, and some but not all of those states specify that parents must be informed of the BMI results. The conference expressed concern that to measure BMIs without taking follow-up action such as referring students to appropriate healthcare would be unproductive. An alternative view was that a better use of BMI results might be "surveillance," to document that a problem exists that calls for action by lawmakers or administrators.

- ***Professional development.*** Concerned that many school nurses may be inadequately prepared professionally to administer weight management programs, the conference suggested that workshops should be made available, through teleconferences or online video, or at designated sites in states. It was suggested that an efficient approach might be to make training available to state school nurse coordinators, who could then pass the information on to school nurses.
- ***Motivational interviewing.*** Conferees cited the need to reach parents with information about student overweight and the need to motivate both parents and students to make necessary behavioral changes. "Motivational interviewing," a technique for achieving behavioral change used by many therapists, in which the interviewer does not prescribe solutions but helps the patient to review and select options for change, may be especially effective in talking to overweight students and their parents.
- ***Dissemination and replication.*** Childhood overweight is currently being addressed by a number of school programs, but information about what works and what does not is hard to come by, conference attendees were told. Print information about what another school is doing is largely ineffective, speakers said, but what does seem to get results is enabling prospective adopters to visit existing programs. There is also need for a "kit" of information for beginning programs.
- ***Networking.*** The conference participants heard repeatedly of the value of community collaboration with schools by social service agencies, health providers, civic groups, and nonprofit entities such as hospitals. In some successful networks, each group offers to take a piece of the action, contributing what it knows best how to do.
- ***Prevention.*** The conference participants also agreed that the best way to remedy childhood overweight is to prevent it from developing in the first place and suggested that information and guidance on eating and exercise should be part of health education programs that reach all students. For guidance to be effective, schools must examine their policies on foods available to students and opportunities for physical activity during the school day.
- ***Health/Wellness Councils.*** Conference presenters who have worked with these district-wide health councils stressed their value to school weight management programs, as a way of adding resources and giving credibility to school efforts. It was noted that a federal mandate for all schools participating in the National School Lunch or Breakfast programs to have "wellness policies" in place by the beginning of the coming school year does not include school health personnel in the list of required participants but does not bar their participation.

Lighthouse Programs

The following school-based programs were described at the conference.

Childhood Healthy Lifestyle Program, Atlanta, Georgia
After increased prevalence of obesity was observed in two school-based health clinics in one elementary school and one middle school in Atlanta, Georgia, school-wide body mass index assessments revealed that 17 percent of students at Whiteford elementary and 24.9 percent of students at Coan middle school were above the 95th percentile, meaning they were severely overweight, and another 19.5 percent at Whiteford and 24 percent at Coan were in the high-risk 85-percent to 95-percent category. The Lifestyle initiative proposed to establish a health promotion program for all students and a weight loss/fitness program for overweight students. The program found it difficult to identify curricula for use in schools, but decided to implement the Take 10 exercise program in the participating elementary school and Planet Health in the middle school. For weight reduction, the program enrolled both overweight and at-risk students into twice-weekly exercise classes and twice-monthly nutrition classes. The clinics followed body mass index by blood work to measure lipids, glucose, and insulin resistance, and the program found parents, many of whom had experience with diabetes, more responsive to evidence of health problems that may lead to diabetes than to general information about overweight. Challenges to implementation of the Lifestyle program included lack of parental involvement at the middle school level, fear of ridicule by other students by students enrolled in the weight-loss program, difficulty in persuading teachers to add Take 10 to other responsibilities in the elementary school, and difficulty in conducting school-wide educational sessions in middle school because of academic schedules.

California's School Nutrition Policy Campaign
A major campaign to educate policymakers about childhood obesity began in California in 1998, with mobilization of grassroots teams in six assembly districts in Los Angeles that launched town hall meetings to address such issues as the quality of school food, school health education, school physical education, after-school programs, and classes for parents. Legislation passed by the state assembly in 2001 set policy standards for nutrition in schools K-12, after a heated political campaign in which supporters included the state governor, the state school superintendent, every major health organization, every major school organization, health care providers and insurers, and consumer groups; and opponents included some school districts and "industry, industry, industry." Although a "soda tax" has so far failed to pass in the state legislature, the Los Angeles school district banned soda sales in all its schools in 2005.

The Partnerships Project, Columbus, Ohio
Three foundations invited university, business health, health care, and education leaders from the community to address obesity problems in Columbus. An initial meeting led to creation of the Partnership Project, in which participants such as United Way are now filtering their programs through the partnership, and each agency or sector has taken on "a piece of the action." Among other activities, the project asks

schools and other community organizations to host workshops or events, with the goal of giving families opportunities to participate in weight loss and dietary counseling in their own communities on a weekly basis. Among the resources the project uses are maps available from city planners that can be used to identify community resources such as parks and grocery stores, by postal zip codes.

Act 1220: Body Mass Assessment in Arkansas

After the state legislature passed a law in 2002 making it obligatory for all schools in Arkansas to include a body mass index as part of an annual report to parents, the state became the first to make body mass index a part of every student's health record. Goals of the new law, Act 1220, were to change the environment within which children go to school and learn health habits every day and to enhance awareness of child and adolescent obesity in order to mobilize resources and create support structures. To implement the law, the Department of Health used dollars from a tobacco settlement to enable the state to purchase instruments for measuring height and weight, which were distributed to all schools. Body mass assessments were conducted by school personnel to protect the privacy of students. Currently, the state has received foundation funding to analyze the results of the first two years of the program, in part to try to determine the effects over time on students found to be overweight or at risk of overweight, including the extent to which they or their parents sought medical advice and whether they experienced increased teasing, bullying, or eating disorders. In addition to the requirement for body mass index assessment, Act 1220 called for elimination of vending machines in public elementary schools statewide, and mandated professional education of all cafeteria workers, public disclosure of "pouring contracts," and establishment of parent advisory committees in all schools. Results of the initial evaluation of this program appeared in the July/August 2006 issue of *Health Affairs,* "Arkansas Fights Fat: Translating Research Into Policy To Combat Childhood and Adolescent Obesity."

The Tween Study, New Haven, Connecticut

A pilot study begun in 2000 in New Haven Public Schools by personnel from the Yale School of Nursing aimed to determine the effects on clinical outcomes of an after-school, school-based intervention using nutrition education, exercise, and coping skills training in middle schools. The study also planned to explore the experiences of youth and families in the management and understanding of obesity as it relates to preventing type 2 diabetes. Prior to the study, it was found that weight generally was not associated with health issues and was believed to be out of the control of both youth and families. Following the initial two-year study, a broader three-year school-based study is incorporating culturally sensitive nutrition education and enhanced physical activity, along with coping skill training to help children make healthy lifestyle choices, into the school curriculum in five middle schools in New Haven, with weekly health coaching for participants. Baseline data on more than 100 youths with body mass index greater than 85 percent and a family member with diabetes revealed that the majority of those young people were insulin resistant. Further data collection and analysis is ongoing.

Appendix 1. Summary of Action Recommendations

A. *Recommendations for convening, developing partnerships, and training*

1. *Define and test school health professionals' roles in preventing/managing childhood obesity.* Convene a panel of school health professionals (school nurses, school-based health center staff and state school nurse consultants) to: (1) define the roles of school nurses and school-based health center staff in preventing or managing childhood obesity; (2) identify specific knowledge and skills essential for successful performance of those roles, (3) design a training program to fill gaps in school health professionals' knowledge/skills, (4) test the clinical and organizational viability of the model via small grant program, and (5) communicate results.

2. *Create a school-community chronic disease management model.* Building on work from the National Diabetes Education Program , establish a task force of child and school health experts to explore the roles of school nurses and school-based health center staff in managing chronic diseases in partnership with community-based health professionals, with childhood overweight serving as an initial focus.

3. *Structuring a school health professional-parent leaders partnership to promote joint advocacy at the school, community and state levels in the fight against childhood obesity.* Building on earlier work by CDC and using relationships with school health professional organizations, PTAs, and policy advocates nurtured by the recent Roundtable, convene representatives of these groups to develop models for action at the school, community and state levels. Follow up with a process similar to that in recommendation #1: identify roles and knowledge required, develop strategies to implement, test model(s) through grant initiative, and communicate results.

B. *Recommendations for research*

1. *Define the links between health and academic achievement.* This was the primary research question of interest to the participants. With federal No Child Left Behind legislation continuing to drive the priorities of K-12 school administrators and school boards, the strongest research interest among Roundtable participants was rigorous investigation of causal links between student health status and academic performance. This diverse group from health and education concurred that findings to date have been either inconclusive or unpersuasive.

2. *Refine the CDC 8-component coordinated school health program model.* For 20 years, the CDC Division of Adolescent and School Health has disseminated this 8-pronged, school-based approach to building better health programs and better health outcomes for children and adolescents. An evaluation that looked at variations in program implementation and examined associations among the

variants with healthier weight outcomes could support a program that has an established infrastructure and potential for enhanced outcomes.

3. *Facilitate obesity surveillance using BMI.* Using BMI as a tool for surveillance attracted broad interest, with a specific recommendation that a standardized sampling methodology for BMI surveillance should be developed.

4. *Evaluate the effectiveness of motivational interviewing in managing students who are at risk for overweight or overweight.* An increasingly common tool used by school-based health centers is motivational interviewing. There is great interest in research that would provide guidance concerning the utility of motivational interviewing for managing weight issues. There is also great interest in projects that will replicate promising school-based practices related to childhood obesity with a view to increasing the evidence base available to school health professionals.

Recommendations for education and training

While outside the scope of school health professionals' practice and within the purview of Action for Healthy Kids and the National Association for Health Education among others, there was keen interest in recommendations concerning health education. These included a desire for guidance on characteristics of a well-designed k-12 nutrition education curriculum, replication of curricula with promising results in nutrition and physical activity, and, in a broader vein, more effective state-by-state dissemination strategies that focus on community-level approaches for increasing physical activity, improving school-wide nutrition, and involving families in these efforts.

Appendix 2. Conference Planning Committee

Terry Bazzarre, PhD, MS, *Senior Program Officer*
The Robert Wood Johnson Foundation

Margie Tudor Bradford, RN, *Member, School Board*
Bardstown Independent School District

Barbara Frankowski, MD, *Chair, Council on School Health*
American Academy of Pediatrics

Bruce P. Guernsey, MSW, *President*
National Assembly on School-Based Health Care

Whitney Meagher, MSW, *Program Coordinator, Health and Welfare*
National PTA

Sue Will, MPH, RN, NCSN, FNASN, *President*
Donna Mazyck, MS, RN, NCSN, *President-Elect*
National Association of School Nurses

Amy Winterfeld, JD, *Program Principal, Health Program*
National Conference on State Legislatures

Appendix 3. Conference Participants

Midge Barrett, MS, RN
Director, Center for Children's
Health Innovation
Nemours Health and Prevention Services
252 Chapman Road
Christiana Bldg., Suite 200
Newark, DE 19702
Phone: 302-444-9103
Fax: 302-444-9200
E-mail: mabarret@nemours.org

Terry Bazzarre, PhD, MS
Senior Program Officer
Robert Wood Johnson Foundation
Route One and College Road East
P.O. Box 2316
Princeton, NJ 08543-2316
Phone: 609-627-7567
E-mail: tbazzar@rwjf.org

James Bogden, MPH
Director, Safe & Healthy Schools
National Association of State Boards
of Education
277 South Washington Street
Suite 100
Alexandria, VA 22314
Phone: 703-684-4000
Fax: 703-836-2313
E-mail: jimb@nasbe.org

Margie Tudor Bradford, RN
Member, School Board
Bardstown Independent School District
305 Cathedral Manor
Bardstown, KY 40004-1208
Phone: 502-348-8709
E-mail: mtudorb@aol.com

Laura Brey, MS
Director of Training and Technical Assistance
National Assembly on School-Based
Health Care
Raleigh Office
6305 Rushingbrook Drive
Raleigh, NC 27612
Phone: 919-866-0920
Fax: 919-866-0930
E-mail: lbrey@nasbhc.org

Barbara N. Fish, MA
Member, Board of Education
West Virginia Board of Education
112 Woodshire Drive
Parkersburg, WV 26104
Phone: 304-485-4443
Fax: 304-428-8229
E-mail: Barbara@bfish.org

Harold Goldstein, DrPH
Executive Director
California Center for Public
Health Advocacy
P.O. Box 2309
Davis, CA 95617
Phone: 530-297-6000
Fax: 530-297-6200
E-mail: hg@publichealthadvocacy.org

LaVerne Green, MSN
Office of Minorities & Special Populations
Bureau of Primary Health Care, HRSA
US Department of Health and Human Services
Parklawn Building
5600 Fishers Lane
Rockville, MD 20857
Phone: 301-594-4451
E-mail: lgreen@hrsa.gov

Brenda Greene, MFA
Director, School Health Programs
National School Board Association
1680 Duke Street
Alexandria, VA 22314
Phone: 703-838-6756
Fax: 703-548-5516
E-mail: bgreene@nsba.org

Julie Farkas
Senior Program Officer
Consumer Health Foundation
1400 16th Street, NW, Suite 710
Washington, DC 20036
Phone: 202-939-3390
Fax: 202-939-3391
E-mail: chf@consumerhealthfdn.org

Bruce P. Guernsey, MSW
President, National Assembly on School-Based Health Care
Program Director, Coordinated School Health and School Based Health Centers
Prevention Services Division
Colorado Dept. of Public Health & Environment
4300 Cherry Creek Drive South
FCHSD-AH-A4
Denver, CO 80246
Phone: 303-692-2377
Fax: 303-782-5576
E-mail: Bruce.Guernsey@state.co.us

Elaine Gustafson, MSN, APRN, CS, PNP
20 Rogers Rd.
Hamden, CT 06517
Phone: 203-676-9988 (cell)
E-mail: Elaine.gustafson@yale.edu

Nora Howley, MA
Deputy Director
Action for Healthy Kids
4711 West Golf Road, Suite 625
Skokie, IL 60076
Washington Contact Information
Phone: 301-592-1271
Fax: 301-592-1247
E-mail: nora@actionforhealthykids.org

Veda Johnson, MD
Medical Director, Whitefoord and Coan School-Based Clinics
Assistant Professor, Department of Pediatrics
Emory University School of Medicine
49 Jessie Hill Jr. Drive
Atlanta, GA 30303
Phone: 404-778-1419
E-mail: veda_johnson@oz.ped.emory.edu

Kathryn E. Keller, MPA
Program Officer—School-Aged Children's Healthcare
Health Foundation of Greater Cincinnati
Rookwood Tower
3805 Edwards Road, Suite 500
Cincinnati, OH 45209-1948
Phone: 513-458-6616
Fax: 513-458-6610
E-mail: kkeller@healthfoundation.org

Leonard Massie Jr., MS
Principal
LaSalle Elementary School
D.C. Public Schools
501 Riggs Road, NE
Washington, DC 20011
Phone: 202-576-6120
E-mail: leonard.massie@k12.dc.us

Donna Mazyck, MS, RN, NCSN
President-Elect
National Association of School Nurses
Health Services Specialist
Maryland State Department of Education
200 West Baltimore St.
Baltimore, MD 21201
Phone: 410-767-0313
E-mail: dmazyck@msde.state.md.us

J. Michael McGinnis, MD, MPP
Senior Scholar
Institute of Medicine
The National Academies
500 Fifth St., NW
Washington, DC 20001
Phone: 202-334-3963
Fax: 202-334-1412
E-mail: mmcginnis@nas.edu

Whitney Meagher, MSW
Program Coordinator, Health and Welfare
National PTA
1400 L Street, NW, Suite 300
Washington, DC 20005
Phone: 202-289-6790, ext. 216
Fax: 202-289-6791
E-mail: wmeagher@pta.org

Robert Murray, MD
Chair-Elect, AAP Council on School Health
Director, Center for Healthy Weight and Nutrition
Columbus Children's Hospital
700 Children's Drive
Columbus, OH 43205
Phone: 614-722-4950
E-mail: murrayro@chi.osu.edu

Margaret K. O'Bryon, MURP
President & CEO
Consumer Health Foundation
1400 16th Street, NW, Suite 710
Washington, DC 20036
Phone: 202-939-3390
Fax: 202-939-3391
E-mail: chf@consumerhealthfdn.org

Kimberly Perry
Chair, DC Action for Healthy Kids
Director, DC Hunger Solutions
1875 Conn. Ave., NW, Suite 540
Washington, DC 20009
Phone: 202-986-2200 ext 3023
Fax: 202-986-2525
E-mail: kperry@dchunger.org

Keshia M. Pollack, PhD, MPH
Fellow, Research & Evaluation
Robert Wood Johnson Foundation
Route 1 and College Road East
Princeton, NJ 08543
Phone: 609-627-7530
E-mail: kpollack@rwjf.org

Diane Powell, PhD
Assistant Superintendent for Support Services
D.C. Public Schools
825 N Capital Street, NE
Washington, DC 20002
Phone: 202-442-
E-mail: diane.powell@k12.dc.us

Debbie Ritchie, RN
Council President, AACCPTAs, Inc.
Parent Involvement Chair, Maryland PTA
3464 Marble Arch Drive
Pasadena, MD 21122
Phone: 410-439-3949
Fax: 410-439-3493
E-mail: dtritchie@aol.com

Virginia Robinson
Editor & Consultant
Center for Health and Health Care in Schools
2121 K Street, NW, Suite 250
Washington, DC 20037
E-mail: robinsoneditor@attglobal.net

Joy Rockenbach
Arkansas Center for Health Improvement
1401 West Capitol Avenue
Suite 300, Victory Building
Little Rock, AR 72201
Phone: 501-526-2260
Fax: 501-526-2252
E-mail: RockenbachJoyC@uams.edu

Kathy Strasser, RN, BSN
School Nurse
Norwood City School District
2020 Sherman Avenue
Norwood, OH 45212
Phone: 513-924-2882
Cell: 513-379-2588
Fax: 513-396-5559
E-mail: strasser.k@norwoodschools.org

Vicki Taliaferro, RN, BSN, NCSN
Health Services Specialist
Maryland State Department of Education
200 West Baltimore Street, 4th Floor
Baltimore, MD 21201
Work: 410-767-0305
Fax: 410-333-8148
E-mail: vtaliaferro@msde.state.md.us

Howard L. Taras, MD
American Academy of Pediatrics
Member, Task Force on Obesity
University of California – San Diego
Professor of Pediatrics
9500 Gilman Dr., #0927
La Jolla, CA 92093-0927
Phone: 619-681-0665
Fax: 619-681-0666
E-mail: htaras@ucsd.edu

Howell Wechsler, EdD, MPH
Director, Division of Adolescent and
School Health
National Center for Chronic Disease
Prevention and Health Promotion
Centers for Disease Control and Prevention
4770 Buford Highway, MS K-29
Atlanta, GA 30341-3717
Phone: 770-488-6100
Fax: 770-488-6191
E-mail: hwechsler@cdc.gov

Pamela Weddington
Vice President of Communications
MEE Productions, Inc.
340 N. 12th Street, Suite 503
Philadelphia, PA 19103
Phone: 215-829-4920
Fax: 215-829-4903
E-mail: MEEComm@aol.com

Amy Winterfeld, JD
Program Principal
Health Program
National Conference on State Legislatures
7700 East First Place
Denver, CO 80230
Phone: 303-364-7700 ext. 1544
Fax: 303-364-7800
E-mail: amy.winterfeld@ncsl.org

Sherri Wright, RN
Chair, Health and Safety Committee
Virginia PTA
School Health Facilitator
Danville Public Schools
Central Office Annex
31 Baltimore Avenue
Danville, VA 24541
Phone: 434-799-6406 ext 235
Fax: 434-799-6467
E-mail: swright@mail.dps.k12.va.us

The Center for Health and Health Care in Schools

Julia Graham Lear, PhD, Director
jgl@gwu.edu

Olga Acosta Price, PhD, Deputy Director
oaprice@gwu.edu

Nancy Eichner, MUP, Senior Program Manager
neichner@gwu.edu

Theresa Chapman, Executive Coordinator
chapman@gwu.edu

Brandi Robinson, MPH, Program Associate
bnrobin@gwu.edu

Sandra Madueke, Graduate Research Assistant
sandra@gwu.edu

Elizabeth Anderson-Hoagland, Graduate Research Assistant
elah@gwu.edu

Appendix 4

InFocus: Body Mass Index for Children, May 2006

In the mid-19th century, a Belgian mathematician famous for his statistical prowess developed a technique for measuring the amount of fat in the human body. The "Quatelet Index" created by Lambert Adolphe Jacques Quatelet became what we know as "body mass index," a statistical correlation of the relationship between the height and weight of an individual arrived at by dividing body weight in kilograms by height in meters squared.

Used throughout the world in the centuries after Quatelet arrived at his formula, body mass index (BMI) as an indicator of health risk was not commonly practiced by clinicians in the United States until the late 1900s. It has now been widely publicized in this country. A computer search engine given the descriptor "body mass index" comes up with 145,000 entries, offering not only calculators that instantly convert height and weight in pounds and inches into the Quatelet index but also a host of commercial diet and weight control programs that promise to correct any unwelcome conditions the BMI reveals.

Recent converts to the BMI are schools in states (including, as of 2005, Arkansas, Illinois, New York, Tennessee, and West Virginia) that are mandated by their state legislatures and school boards to measure body mass index of all students annually, and in many states, to convey that information to parents. In Pennsylvania, in 2005, the state health department instituted a mandatory Growth Screening program for school grades K – 4. Schools must calculate student BMIs and plot them against the CDC growth charts. The program will be expanded by three grades each year until all 12 grades are covered. There are also an unknown number of schools or school districts that appear to have decided on their own to measure BMI as part of traditional height-and-weight assessments. All of this new interest means that a substantial percentage of children are now having body mass index percentiles added to their school health records.

Given that so much BMI assessment is taking place in schools, it is especially important to emphasize that "BMI is used differently for children than it is with adults," according to the Centers for Disease Control and Prevention (CDC) in the United States Department of Health and Human Services. "Children's body fatness changes over the years as they grow. Also, girls and boys differ in their body fatness as they mature," the CDC points out.

This is why BMI for children is referred to as BMI-for-age and is plotted on gender-specific growth charts for measuring body fat in children, with each chart containing a series of curved lines indicating specific "percentiles." Those percentiles simply mean that if a child is in a given percentile—say the 60th percentile, for example—60 percent of children of the same age and gender have a lower BMI.

Body mass index decreases during the preschool years, then increases into adulthood, and the percentile curves show this pattern of growth. Useful for measuring body mass

index from ages 2 to 20, BMI-for-age provides a reference for adolescents that can be used beyond puberty, the CDC points out.

The CDC advises healthcare professionals to use the following established percentile cutoff points to identify underweight and overweight in children:

- Underweight—BMI-for-age less than 5th percentile
- Normal—BMI-for-age 5th percentile to less than 85th percentile
- At risk of overweight—BMI-for-age 85th percentile to less than 95th percentile
- Overweight—BMI-for-age 95th percentile or more.

Those age-related BMI charts were developed by the National Center for Health Statistics (NSHS) in response to increasing use of body mass index as a way of assessing children's health. BMI gained momentum in 1994, when an expert committee recommended that body mass index be used routinely to screen for overweight in children 11 to 21 years of age. A second recommendation, in 1997, by a committee looking into assessment and treatment of childhood obesity, fueled further interest by concluding that BMI could be used to screen for overweight in children 2 years of age and older (2 years was chosen as the first age at which stature could reliably be measured).

The NCHS notes that pediatric growth charts in one form or another have been used by pediatricians, nurses, and parents to track the development of infants, children, and adolescents in the United States since 1977, when the first charts were developed by the NCHS and were adopted by the World Health Organization for international use.

It was assumed in 1977 that the growth charts might need to be revised periodically, to reflect changes in the growth patterns of Americans as reflected in data from the National Health and Nutrition Examination Survey (NHANES). Since the 1960s, the NHANES periodically has collected height, weight and other health information on the American population. When the charts were revised in 2000, new body-mass-index-for-age charts for boys and girls ages 2 to 20 years were added, and the NCHS explained they were to be used in place of the 1977 weight-for-stature charts.

Some Caveats

The increasing popularity of body mass as an indicator of health in children is leading to some cautions. The Centers for Disease Control and Prevention points out that growth charts, including the BMI Index-for-Age charts, "are not intended to be used as the sole diagnostic instrument." "Instead," the CDC says, "growth charts are tools that contribute to forming an overall clinical impression for the child being measured."

In a study published in the journal *Pediatrics* in March 2006, researchers asked whether changes in the body mass index percentile really reflect changes in the body composition of children and concluded that although high correlations have been reported between BMI and both total body fat and percentage of body fat during childhood, BMI is not a precise indicator of the underlying proportion of fat and lean tissue. "The extent to which BMI percentile changes may or may not reflect

corresponding changes in body fatness (or leanness) in children is not known," the researchers noted.

Although it dealt only with U.S. adults, another study has found that the "lipid accumulation product" performs better than body mass index in predicting cardiovascular risk. The researchers noted that "obesity is commonly understood to imply excess fat," but what may be more significant is how fatty tissues are distributed in various parts of the body—at the waistline, for instance. In other words, at least in adults, having a "pot belly," regardless of body size, is believed to predispose to increased prevalence of obesity-related disease, while fat predominantly deposited around hips and buttocks does not seem to carry the same risk.

Questions have been raised as to whether schools are the appropriate site for body mass index screenings, and it remains unclear to what extent the BMI results are being used by parents or school health personnel to counsel or refer for treatment students found to be overweight. Also not known is whether emphasis on body mass is creating concerns among adolescents leading to eating disorders such as bulimia or anorexia.

A wide body of research since the mid-1990s does show that body mass index, for both children and adults, is now an accepted measure of the causes of and possible treatments for a broad range of disorders, including not only diseases such as diabetes and heart disease, but also seemingly less related conditions such as asthma. In a 2006 report on obesity in children, the journal *Future of Children* notes that taking measures such as height, weight, and body mass annually, and converting them to an age-and-gender-specific BMI percentile for each child "makes it possible to monitor individual children over time" and provides an opportunity for early intervention in obesity prevention.

The *CDC has issued a number of tools for calculating BMI-for-age, including:*

- *A web calculator and tables of calculated BMI values for selected heights and weights of children 2 to 20 years of age;*
- *A BMI web calculator for English and metric systems;*
- *A CDC table--Calculated Body Mass Index Values for Selected Heights and Weights for Ages 2 to 20.*
- *A 44-page booklet, The BMI Table for Children and Adolescents, is available in print from the CDC.*

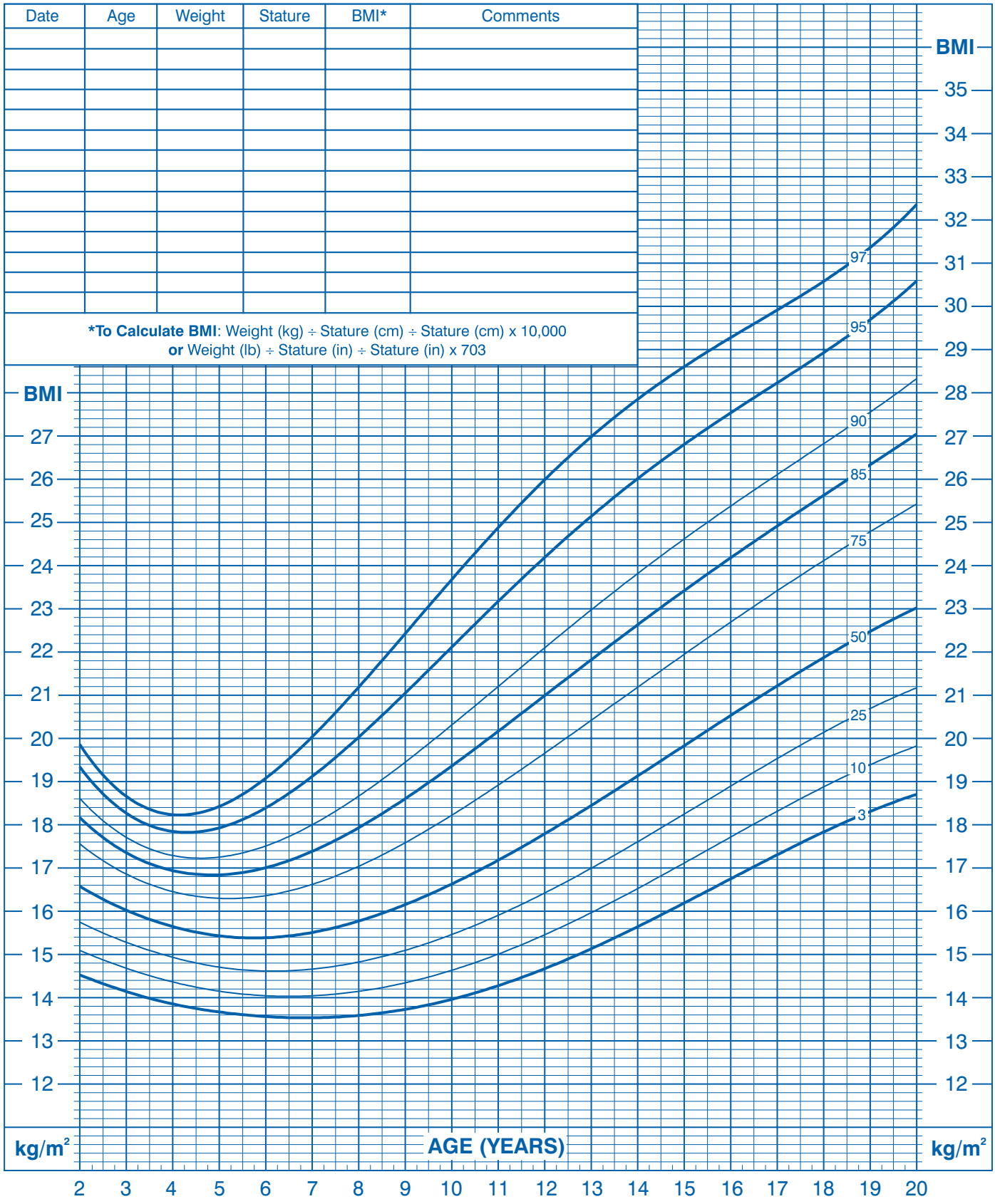
2 to 20 years: Boys
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

***To Calculate BMI**: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

SAFER • HEALTHIER • PEOPLE™

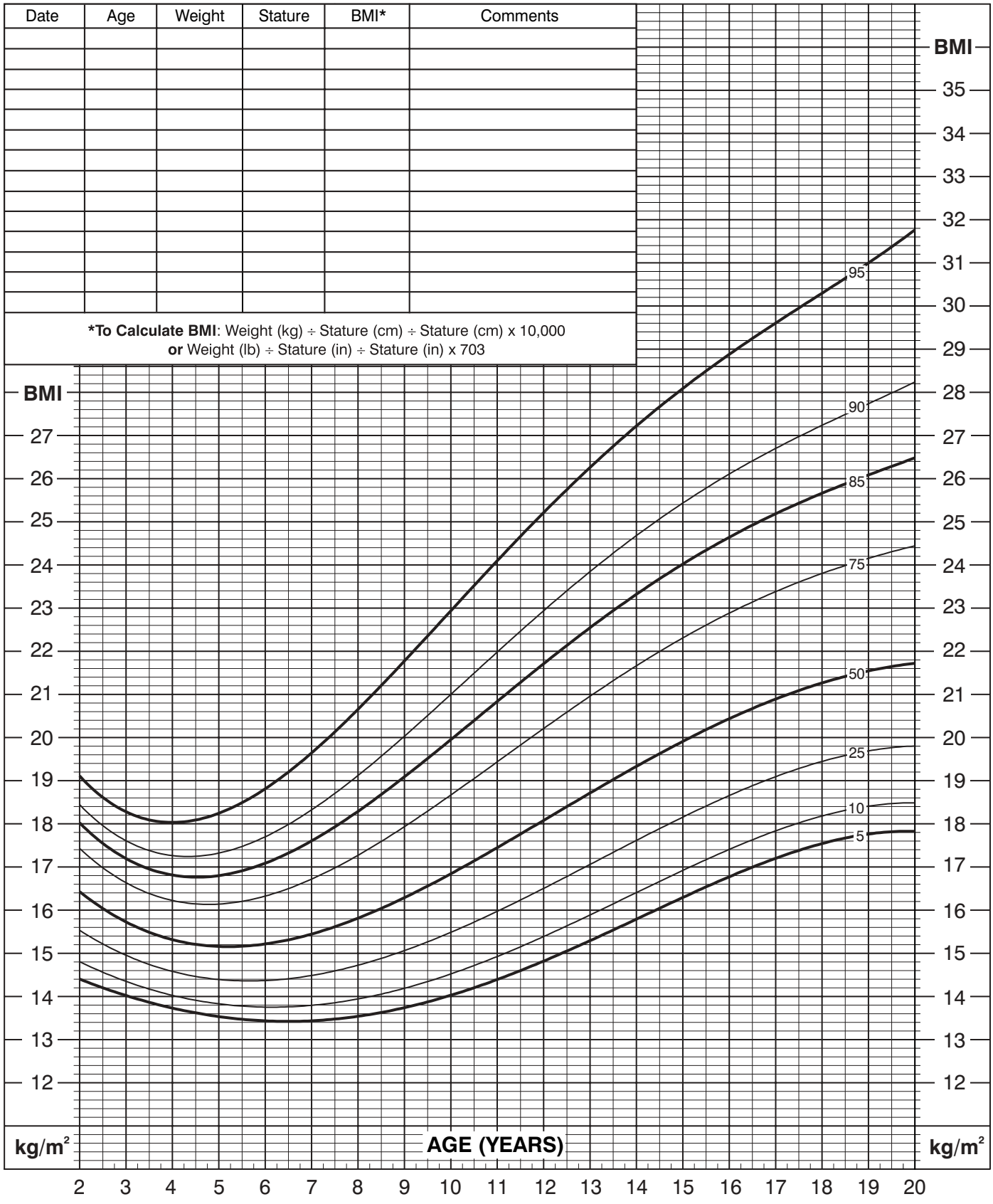
2 to 20 years: Girls
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

***To Calculate BMI**: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

CDC
SAFER • HEALTHIER • PEOPLE™