Site Specific Approaches

Prevention or Management of Pediatric Obesity

July 14-15, 2004

Hyatt Regency Bethesda

Bethesda, MD

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Sponsors

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Agenda

July 14, 2004

7:30am **Continental Breakfast and Registration**

8:00am **Welcome and Introduction to the Workshop**
Robert Kuczmarski, DrPH, National Institute of Diabetes and Digestive and Kidney Diseases, NIH

Workshop Chair: Ken Resnicow, PhD, University of Michigan School of Public Health

8:15-10:00 am **Session 1**
Moderator: Howell Wechsler, EdD, MPH, National Center for Chronic Disease Prevention and Health Promotion, CDC

School Based Intervention Studies
State of the science: successes and what didn't work in selected major representative trials:

- **8:15am** **CATCH: A Coordinated Approach to Child Health**
  Larry S. Webber, PhD, Tulane University School of Public Health and Tropical Medicine
- **8:30am** **SPARK Programs for Physical Activity Promotion**
  James F. Sallis, PhD, San Diego State University
- **8:45am** **Planet Health**
  Karen Peterson, DSc, Harvard School of Public Health
- **9:00am** **PATHWAYS: A Randomized Trial for the Primary Prevention of Obesity in American Indian Children**
  Benjamin Caballero, MD, PhD, Johns Hopkins University
- **9:15am** **Bienestar: A School-Based Diabetic Control Program**
  Roberto P. Treviño, MD, Social & Health Research Center
- **9:30am** **All Other School Studies + STOPP-T2D**
  Ken Resnicow, PhD, University of Michigan School of Public Health
- **9:45am** **Creating a Healthy School Environment**
  Howell Wechsler, EdD, MPH, National Center for Chronic Disease Prevention and Health Promotion, CDC

10:00am **Break**

10:30am **Discussion with Panel Including Speakers from Session 1**
Facilitator: Howell Wechsler, EdD, MPH, National Center for Chronic Disease Prevention and Health Promotion, CDC

11:30am **Free Time**

12:00-12:45 pm **Working Lunch**

12:00-2:15 pm **Session 2**
Moderator: John P. Elder, PhD, San Diego State University

Home; Other Underutilized/Potential Sites; Novel Modalities
State of the science: what worked and potential research partners:

- **12:00pm** **The GEMS Phase 1 Program: Four Pilot Studies**
  Eva Obarzanek, PhD, National Heart, Lung, and Blood Institute, NIH

- **12:15pm** **Family-Based Behavioral Interventions**
  Leonard H. Epstein, PhD, University of Buffalo

- **12:30pm** **Media - VERB**
  Faye L. Wong, PhD, National Center for Chronic Disease Prevention and Health Promotion, CDC

- **12:45pm** **Web-based Weight Management Programs**
  Victor J. Strecher, PhD, University of Michigan

- **1:00pm** **Take Ten Program**
  Harold W. Kohl, III, PhD, National Center for Chronic Disease Prevention and Health Promotion, CDC

- **1:15pm** **Exercise Interventions for Improvement of Body Composition in Youths**
  Bernard Gutin, PhD, Medical College of Georgia

- **1:30pm** **Home-Based Studies in Hispanics**
  John P. Elder, PhD, San Diego State University

1:45pm **Break**

2:00pm **Discussion with Panel Including Speakers from Session 2**
Facilitator: John P. Elder, PhD, San Diego State University

3:30-5:30 pm **Session 3**
Moderator: Diane Beth, MS, RD, LDN, North Carolina Department of Health and Human Services

Community and Trans-Community Sites
Review of what worked, ongoing trials, and innovative approaches from other fields:

- **3:00pm** **Trial of Activity in Adolescent Girls: A Work in Progress**
  Leslie A. Lytle, PhD, RD, University of Minnesota

- **3:15pm** **GO-GIRLS**
  Ken Resnicow, PhD, University of Michigan School of Public Health

- **3:30pm** **Obesity Prevention among Inner-City Preschool Minority Children**
  Marian L. Fitzgibbon, PhD, Northwestern University Feinberg School of Medicine

- **3:45pm** **Prevention of Childhood Overweight: The Role of Child Care Settings**
  Barbara A. Dennison, MD, New York State Department of Health

- **4:00pm** **Break**

- **4:15pm** **Applying Theory and Methods of Community-Based Drug Abuse Prevention to Pediatric Obesity Prevention**
  Mary Ann Pentz, PhD, University of Southern California

- **4:30pm** **The Built Environment and Obesity in Children**
  Ross C. Brownson, PhD, Saint Louis University

- **4:45pm** **The Role of CBPR in Childhood Obesity Prevention & Treatment**
  Alice Ammerman, DrPH, RD, University of North Carolina at Chapel Hill

- **5:00pm** **Changing Physical Activity, Body Image, and Food Choice Behaviors Throughout a Community**
  Sylvia Moore, PhD, RD, University of Wyoming

■ **5:15pm** **Eat Smart, Move More North Carolina**
Diane R. Beth, MS, RD, LDN, North Carolina Department of Health and Human Services

5:30pm **Discussion with Panel Including Speakers from Session 3**
Facilitator: Diane R. Beth, MS, RD, LPN, North Carolina Department of Health and Human Services

6:30pm **Adjourn**

July 15, 2004

7:30am **Continental Breakfast**

8:00–12:30pm **Session 4**

- **8:00am** **Overview of Previous Day**
  Ken Resnicow, PhD, University of Michigan School of Public Health
- **8:15am** **Reducing Children's Screen Time to Prevent Obesity**
  Thomas N. Robinson, MD, MPH, Stanford University
- **8:30am** **School Based Studies in Perspective**
  Mary Story, PhD, RD, University of Minnesota

8:45am **Discussion**

Discussion led by panel of Ken Resnicow, PhD, Thomas N. Robinson, MD, MPH, and Mary Story, PhD, RD

Discussion of future research directions, guided by a pre-assembled list of questions made available to participants, emphasizing the following major areas:

- **Lessons Learned and Other Directions that Should be Encouraged**
- **Barriers and Constraints to Research**
- **Outstanding Research Challenges and Opportunities in Each of the Major Sites**
- **Approaches to Standardize Outcomes**
- **Role of Partnerships in Research and the Need for Applicants to Establish Partnerships**

10:00am **Break**

10:30am **Discussion Continued**

12:30pm **Adjourn**

Planning Committee

Robert Kuczmarski
National Institute of Diabetes and Digestive and Kidney Diseases, NIH

Barbara Linder
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Division of Nutrition Research Coordination, NIH

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National Cancer Institute, NIH

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Van Hubbard
National Institute of Diabetes and Digestive and Kidney Diseases / Division of Nutrition Research Coordination, NIH

Martina Vogel-Taylor
Office of Disease Prevention, NIH

Susan Yanovski
National Institute of Diabetes and Digestive and Kidney Diseases, NIH

Workshop Purpose and Goals

The purpose of the workshop is to provide a forum in which selected experts:

- Present review and synthesis of relevant past and on-going research across major intervention sites.
- Identify possible new intervention approaches.
- Discuss the state of the art for site-based obesity prevention or management intervention initiatives focusing on children and adolescents.
- Provide opinions and recommendations on future research needs, directions, and opportunities that will inform the trans-NIH strategic plan for obesity research conducted at or across various intervention sites.
- Identify additional areas that can be considered in future research:
  - Research innovation that should be encouraged in or across these sites.
  - Relevant lessons from other areas of health promotion/disease prevention.
  - Promising combinations of sites or modalities for research on the prevention or management of child/adolescent obesity.

Definition of Sites

Places where children and adolescents spend the majority of their time and where they can be reached through prevention or treatment interventions:

- **Home/family.** A site where research dedicated to the role and mechanism of families in the initiation, support, and reinforcement of fundamental food and beverage consumption, physical activity practices, and sedentary behaviors, or behavioral determinants associated with these practices, will be crucial to initiate or sustain changes in dietary, physical activity, and related behaviors.

- **School.** A site where research can be conducted to increase knowledge, influence attitudes and dietary and physical activity practices, and leverage the role of peer influence.

- **Community**
  a) Institutional (e.g., daycare/preschool, after-school care, faith-based, community/recreational centers, YMCA, etc.)
  b) Environmental (e.g., playgrounds, walk/bike paths, shopping malls, etc.)

- **Integrated trans-community.** A comprehensive community approach to prevent or control childhood obesity might be one that integrates the various individual community sites, school, home/family, and other key influential entities that constitute the community, perhaps combined with innovative modalities.

- Innovative media collaborations and modalities (e.g., Internet, media, industry as a site/partner)

- Primary care provider specifically excluded because this will be addressed in a separate targeted initiative. However, community health care settings, e.g., role of WIC clinics in public health departments will be considered.

Speaker Abstracts

The Role of CBPR in Childhood Obesity Prevention & Treatment

Alice Ammerman, DrPH, RD, University of North Carolina at Chapel Hill

Community-based participatory research (CBPR), as an approach meant to enhance both research and community outcomes, has received increased attention from the research and public health communities in an effort to address the persistent problems of health disparities. Done properly, CBPR benefits community participants, practitioners, and researchers. CBPR is designed to create bridges between scientists and communities, allowing both groups to exchange knowledge and experience. This collaboration can assist in developing culturally appropriate study designs, measurement instruments, and intervention approaches, making projects more efficient and potentially more effective. Finally, CBPR can establish a level of trust that enhances both the quantity and the quality of data collected. The ultimate benefit is the prospect of examining a community's unique circumstances to test intervention approaches most relevant to its needs and thus most likely to be sustainable.

AHRQ awarded funding for a systematic evidence report to the RTI International – University of North Carolina (RTI-UNC EPC). The resulting systematic review consolidates and analyzes the body of literature that has been produced to date on CBPR in several areas relating to key questions focused on improving health in communities. Specifically, the evidence review was conducted to consider:

- What defines community-based participatory research?
- How has CBPR been implemented to date with regard to the quality of research methodology and community involvement?
- What is the evidence that CBPR efforts have resulted in the intended outcomes?
- What criteria and processes should be used for review of CBPR in grant proposals?

Findings from the evidence review will be discussed in the context of an NHLBI-funded church and home-based obesity prevention pilot project including African American girls aged 6-9 and their primary female caregivers (Girls Rule!). Challenges faced by funding agencies and review panels as well as investigators proposing CBPR approaches will be addressed.

Eat Smart, Move More…North Carolina: Statewide and Community Approaches and Partnerships to Promote Healthy Weight (and prevent chronic diseases) in Children and Adults.

Diane Beth, MS, RD, LDN, Nutrition Coordinator/5 A Day Coordinator, Physical Activity & Nutrition Branch, NC Division of Public Health

"Obesity is preventable, but it requires an approach that begins with our children and is consistent throughout our society…we must involve individuals and families, business and industry, government and NGO's, and policy makers at all levels." Carmen Hooker Odom, Secretary NC DHHS

Multilevel, evidence-informed approaches (focusing on policy and environmental change) are being used in North Carolina to impact the health of children and adults. North Carolina's model for the prevention of chronic disease through nutrition and physical activity is focused on communities, organizations and families. Many internal NC DPH staff and external partners (NC Cooperative Extension, Universities, the NC Department of Public Instruction, etc) have embraced the initiative and the goals and recommendations of three documents which form the basis for action in NC. These include the *Moving Our Children Toward a Healthy Weight… Finding the Will and the Way and the NC Blueprint for Changing Policies and Environments in Support of Healthy Eating (and Physical Activity).*

DPH staff and partners work hard to ensure that programs have an integrated…infrastructure, focus on policy and environmental change and consistent communication strategies.

Specific approaches, which are being used to address healthy weight in children, include some of the following:

- Eat Smart: North Carolina's Recommended Standards for All Foods Available in Schools
- **N**utrition **A**nd **P**hysical **A**ctivity **S**elf **A**ssessment for **C**hild **C**are–**NAP-SACC**
- Food package changes and enhanced nutrition (and physical activity) education in the WIC Program
- The Winner's Circle Healthy Dining Program (in community and school venues)
- Eat Smart Move More NC grants and NC Statewide Health Promotion Program funding which supports activities at the local level to create and support policy and environmental change for healthy eating and physical activity.

More information and resources on the ESMMNC initiative can be found at *www.EatSmartMoveMoreNC.com*

The Built Environment and Obesity in Children

Ross C. Brownson, PhD, Saint Louis University

Childhood obesity is a function of energy balance—an adequate level of physical activity among children is essential to maintain this balance. In the past decade, interest in the role of the built (or physical) environment in determining levels of physical activity has grown. This presentation will provide an overview of the evidence linking the built environment with physical activity in children. New studies in both the public health and urban planning literatures show important correlations between specific features of the built environment and physical activity, although most studies have been conducted among adults. The presentation also will review potential harms when the built environment is unsafe (e.g., pedestrian injuries). Certain methodologic challenges will be highlighted and future areas of research will be considered. Finally, policy measures (e.g., building and land-use policies) will be considered for their roles in influencing the built environment and pediatric obesity.

Prevention of Childhood Overweight: The Role of Child Care Settings

Barbara A. Dennison, MD, New York State Department of Health

Prevalence rates for overweight are increasing among all segments of our population, including children, and even toddlers. Dietary behaviors and habits of physical activity or inactivity have their origins in early childhood. Young children are spending increasing amounts of time in child-care settings. These settings and the childcare staff most likely influence the development of the children's lifestyle behaviors. Early educational experiences can increase children's knowledge and awareness. Repeated exposure to novel foods can change food preferences and food consumption patterns while physical education curriculum can increase the amount of time spent in moderate and vigorous physical activities. The *Brocodile the Crocodile* program sought to expand beyond the childcare center to the child's home environment by using take-home activities targeting nutrition, physical activity and TV/video viewing. The *Fit by 5* program builds on these efforts, using community-based participatory research methods and ecological and change theories to expand the reach further into the community. Asset-based community development efforts led to community-based activities for young children and their families as alternatives to watching TV. This culminated in a popular and successful week-long community based "TV Turn-off Week" during the "National TV Turn-off Week".

Preliminary findings for the *Rural Community Partnership to Promote Fitness by Age 5* study will be presented. The challenges of sustainability (through policy and environmental changes) against "unfair" competition will be discussed. Future research needs and directions will also be suggested.

Family-Based Behavioral Interventions

Leonard H. Epstein, PhD, University at Buffalo School of Medicine and Biomedical Sciences

Obesity runs in families, and parents provide an environment and support for eating and activity patterns. Research suggests that including parents as active participants in family-based behavioral treatment programs enhances treatment effects, and that treating the parent and child separately is more effective than treating them together. Treatment of childhood obesity with the parents as the exclusive agents of change is associated with better weight change than treatment where only the child is targeted. In addition, we have found that parent weight loss predicts child weight loss, and that parent modeling is related to both child and parent weight loss. These results support the use of family-based behavioral interventions for pediatric weight control, and may reflect mechanisms underlying the role of parent weight change in child weight change. Challenges for implementation of family-based treatment are also presented.

Research cited from our laboratory was funded by grants from NICHD and NIDDK.

Obesity Prevention Among Inner-City Preschool Minority Children: Hip Hop to Health, Jr.

Marian L. Fitzgibbon, PhD, Northwestern University Feinberg School of Medicine

Overweight is an increasing public health concern, especially among minority children. Effective strategies are needed for the prevention of overweight beginning in the preschool years. The primary objective of the current study was to assess the impact of a culturally proficient dietary/physical activity intervention on changes in body mass index (BMI) (kg/m^2). The design was a randomized controlled trial and conducted between September, 1999 and June, 2002. The trial was conducted in 12 Head Start preschool programs in Chicago, Illinois. Children in six preschools completed a 14-week (3 times weekly) classroom curriculum designed to decrease percentage of energy from fat, increase dietary fiber, and increase physical activity. Children in six control preschools completed a 14-week general health curriculum that did not address diet or physical activity. Both interventions were delivered by trained early childhood educators. Of 409 (89.5% Black) 2-5 year old preschool children who completed the baseline assessment, 362 had anthropometric data at the post-intervention assessment (88.5%), 289 at Year 1 follow-up (70.7%), and 300 at Year 2 follow-up (73.3%). The primary outcome measure was change in BMI and the secondary measures were parental report of child dietary intake and physical activity. Children in the intervention schools had significantly smaller increases in BMI compared to the control schools at one year follow-up, 0.05 vs. 0.59 kg/m^2 respectively; difference -0.54 [95% confidence interval {CI } -0.90 to -0.18], $p < 0.01$; and two year follow-up, 0.53 vs. 1.06 kg/m^2 respectively; difference -0.53 kg/m^2 [95% CI -0.97 to -0.10], $p = 0.02$, with adjustment for baseline age and BMI. The only significant difference between intervention and control children in food intake or physical activity was the difference at Year 1 follow-up in saturated fat intake as percent of calories, 11.6 vs. 12.8 ($p = 0.002$). Hip-Hop to Health Jr. was effective at both Year 1 and Year 2 follow-up in reducing increases in BMI in preschool children. This represents a promising approach to prevention of overweight among minority children in the preschool years.

Exercise Interventions for Improvement of Body Composition in Youths

Bernard Gutin, PhD, Medical College of Georgia

Introduction

The pathophysiologic processes underlying cardiovascular disease and type 2 diabetes are influenced by body composition. Thus, it is important to understand how physical activity (PA) and diet interventions can enhance body composition.

Research findings

A descriptive epidemiology study of 487 adolescents found that that vigorous PA, but not moderate PA, was associated with lower percent body fat (%BF); this implies that PA interventions should emphasize vigorous PA.

A physical training (PT) study in obese 7-11 year olds found favorable effects of a 4-month intervention on %BF, visceral adipose tissue and bone density. Similar results were found for an 8-month PT intervention in obese 13-16 year olds. These efficacy studies involved 30-60 minutes of vigorous PA (mean heart rates >150 bpm) and were offered 5 d/wk after school in our research gym. At other research centers, such interventions have not produced favorable effects on adiposity in nonobese youths, suggesting that a greater amount or intensity of PA may be needed for nonobese youths. We are just completing a study (July, 2004) of a 10 month after-school intervention in black 8-11 year old girls who vary over the spectrum of adiposity; the program is held in the gyms of the schools that the girls attend during the school day and includes 80 min/d of moderate vigorous PA. Preliminary results show favorable effects on %BF and bone density. The MCG FitKid Project, which started in 2003, is based on the idea that youths are typically exposed to obesogenic environments that discourage vigorous PA and encourage unhealthy eating. We hypothesize that exposing youths who vary over the adiposity spectrum to a fitogenic after-school environment that encourages vigorous PA and healthy snacks will have favorable effects on fatness and fitness. Schools have been randomized to the intervention or control arms (9 in each arm). The intervention sessions include:

- a healthy snack
- 40 minutes of homework assistance to assure that the intervention does not have a deleterious effect on school performance
- ~20 minutes of sports skill development
- ~40 minutes of vigorous PA
- ~20 minutes of strengthening and stretching exercises

A mobile research lab equipped with a dual-energy x-ray absorptiometer allows measurements to be taken at the school sites and the intervention is offered on school grounds. Measurements are taken at the beginning and end of each school year and the youths will be followed from the 3rd through the 5th grades. Preliminary analyses of the 1st year's data indicate favorable effects of the intervention on %BF.

Continued

Implications

Taken together with results of PA studies at other centers, our results suggest:

- PA interventions of 30-60 min/d, without concomitant dietary intervention, can have favorable effects in obese youths, but more PA (~80 min/d) may be needed in nonobese youths;
- vigorous PA may be especially valuable to enhance body composition of nonobese youths;
- providing fitogenic after-school environments can be an important component of site-based obesity prevention efforts.

The Trial of Activity in Adolescent Girls (TAAG): A Trans-Community Intervention in Progress.

Leslie A. Lytle, PhD, University of Minnesota

TAAG is a multi-centered intervention trial to evaluate the effectiveness of school-community linked intervention strategies to decrease the decline in physical activity (PA) in adolescent girls. We have just completed the first of two intervention years and therefore, have no results to present. Through our formative, pilot and current intervention work we have identified the following challenges to implementing a trans-community intervention:

- Strong, collaborative partnerships between schools and community agencies providing PA opportunities for adolescent girls, outside of community sports teams, are rare;
- While schools and communities understand the potential benefits of working together toward a common goal (such as increasing PA opportunities for youth) their administrative and personnel structures, and sometimes their missions as agencies or schools are often incompatible;
- It takes a great deal of time and energy from a third party (TAAG intervention staff) to build and maintain communication links and programs between school and community stakeholders. Because of these challenges, long intervention periods are needed when attempting to build sustainable trans-community programs.

In addition to the challenges encountered in linking community agencies, another challenge we face in TAAG is to concurrently design individual-focused intervention strategies that will lead to PA changes in girls at the end of two years of intervention, as well as environmental-focused changes that will be sustained in the schools and evident in our follow-up phase in a different grade cohort. To enhance sustainability, we are testing an innovation that proactively identifies and trains program champions in schools and communities to institutionalize TAAG intervention goals. Finally, a research need identified in TAAG relative to the childhood obesity issue is the need to study what happens to youth energy intake when they are exposed to a PA intervention. We are not collecting any dietary information in TAAG and will not be able to assess if increases in energy expenditure may be offset by increases in energy intake.

Changing Physical Activity, Body Image, and Food Choice Behaviors Throughout a Community: Wellness IN (WIN) the Rockies

Sylvia A. Moore, PhD, RD, University of Wyoming

Children need supportive environments in order to achieve a healthy adult weight. While family situations are pivotal, school and community environments also have significant impacts. Thus, multidimensional, community-based efforts are needed to curb the obesity epidemic and allow children to grow and mature in a healthy way.

This model project sought to support healthy environments for children in rural communities by working with citizens of all ages to promote a healthy community. While elementary-school children were a targeted intervention group, programs and policies throughout the community were assessed relative to their impacts on physical activity, body image, and food choices. In each project community, interventions were identified and implemented by local citizens.

Communities had access to a number of interventions developed and tested specifically for community-based intervention. Height and weight measurements of fifth- and sixth-grade students helped assess impact of implemented programs and individual changes on overall health and allowed tracking of body mass index percentiles. Cross-sectional surveys were used to help measure and validate changes at the individual level among the community at large. Changes in health measures among a cohort of adults helped substantiate further the impacts of community programs and changes.

Project Description
(http://www.uwyo.edu/WinTheRockies/)

This project emphasized a health-centered approach in which children and other community citizens could achieve a healthy weight by developing healthy lifestyles related to physical activity, body image, and food choices. Specifically, this project worked with six rural communities - Preston and American Falls, Idaho; Lewistown and Miles City, Montana; and Powell and Torrington, Wyoming. These towns were encouraged and supported to make significant improvements in overall community health and to make the important transition from focusing on health to embracing health as a shared community value.

Objectives
At the individual and interpersonal/social levels, school children and others in the community were encouraged to:

- improve their physical well-being by improving their food and physical activity habits;
- improve their sense of self-worth, basing it more on healthy eating and physical activity habits and vitality than on body size and shape; and
- become more accepting of people of varying body sizes and shapes.

Continued

Resources

Examples of resources utilized in the communities include:

- a community portrait tool that allowed assessment of institutional/environmental support for healthy lifestyles in each town;
- WIN Kids lessons on physical activity, body image, and food choices (ages 10-13);
- tools to help primary care providers begin or expand meaningful dialogue with their patients about healthy and enjoyable lifestyles related to physical activity, body image, and food choices;
- "A New You: Health for Every Body" program for adults that emphasizes healthy living supported by a physically active lifestyle, "making peace" with food, and respecting body size diversity;
- point-of-purchase programs that promote consumption of healthful beverages and appropriate serving sizes;
- information on ways to discourage school policies that promote sales of sweetened beverages, candy, and other high-energy, low-nutrient products;
- guidance on implementation of community walking programs;
- community grants to fund local projects that supported WIN the Rockies principles.

Results

In response to WIN the Rockies personnel sharing their own data with them, citizens made the decision to increase physical activity and to promote health awareness. Walking programs were initiated and are ongoing in all communities - already engaging slightly more than 20% of the adult population in each community. Distribution of pedometers helped motivate initial participation and has reinforced behavioral change at the individual level. Strategically placed billboards replaced counter-productive advertising with messages about valuing health. In one community, the WIN the Rockies health awareness campaign led to plans for the community's first health fair. Frequent advertising in local newspapers lent constant support to local efforts and kept citizens informed about their own community's progress. Simultaneously, health awareness programs initiated in the schools integrated take-home messages and family activities and thus impacted both student and family behaviors. Evidence of this integration included placement of a vending machines for milk in a local school and a refrigerator for milk in a senior center, and a three-generation and other family walking teams in the physical activity programs. In all instances, the WIN the Rockies team members have been careful to serve as catalysts but to allow local leaders to emerge to assure long-term viability of the programs that communities choose to adopt.

Continued

Analyses of data, both qualitative and quantitative, is ongoing. Initial findings show that adults in these rural communities with a higher Body Mass Index were more likely to drink sweetened beverages, order super-sized portions, eat while doing other activities, and report a lower frequency of participation in physical activity. Body dissatisfaction in this population was associated with a greater likelihood that self-consciousness would keep individuals from participating in physical activity. Rural women in our study ate more fruits and vegetables and restricted portion sizes more than men, but the men drank more milk. Narrative research illustrated the power that others have on individual food and activity behaviors and that values, such as productivity and avoiding wastefulness, also have prominent impact on personal food and activity patterns.

Among the rural children who participated in this study, 78% reported doing something else while eating, and 44% reported watching TV or playing video games outside of school for three or more hours each day. This physical inactivity was reflected in poor performance on the one-mile run, with the average time falling below the 50th percentile for national fitness awards for both genders. Not surprisingly, the average BMI for these children fell between the 75th and 85th percentile for both genders. Nonetheless, these children responded very positively to programs that emphasized physical activity as fun and to programs that emphasized family involvement.

Implementation Risks and Challenges

Community-based research and interventions can be difficult to control in terms of both process and outcome. Since programs and activities occur in "real time," they lack the environmental control available in traditional clinical trials. However, people live in communities, and community-based approaches that build upon existing community interest can be effective. This project benefitted from relationships established and an initial database gathered by WIN the Rockies in its two-year research and intervention phase. Sustaining the momentum of positive changes in behavior that have begun to occur in the communities is essential to project success, and it may be the biggest challenge. Results from ongoing data analyses, communicated effectively to community members, will help maintain enthusiasm for the goal of improved community health.

Publications to date from this project:

Blakely F, Dunnagan T, Haynes G, Moore SA, Pelican S. "Moderate physical activity and its relationship to select measures of a healthy diet." *The Journal of Rural Health*. 2004; 20(2): 160-165.

Continued

Liebman M, Probst K, Moore SA, Pelican S, Holmes B, Wardlaw MK, Melcher LM, Harker JC, Dennee PM, Dunnagan T. "Gender differences in selected dietary intakes and eating behaviors in rural communities in Wyoming, Montana, and Idaho." *Nutrition Research* 2003; 23: 991-1002.

Liebman M, Pelican S, Moore SA, Holmes B, Wardlaw MK, Melcher LM, Liddil AC, Paul LC, Dunnagan T, Hayes GW. "Dietary intake, eating behavior, and physical activity - related determinants of high body mass index in rural communities in Wyoming, Montana, and Idaho. *International J of Obesity*. 2003; 27: 684-692.

Eisenmann JC, Milburn N, Jacobsen L, Moore S. "Reliability and convergent validity of the Godin Leisure-time Exercise Questionnaire in rural 5th-grade school children." *J Human Movement Studies*. 2002; 43: 135-149.

Supported by award number 0004499 through the IFAFS (Initiative for Future Agriculture and Food Systems) Competitive Grants Program/USDA.

The GEMS Phase 1 Program: Four Pilot Studies

Eva Obarzanek, PhD, MPH, RD, National Heart, Lung, & Blood Institute

GEMS is a two-phase program initiated to address the problem of obesity in African American girls, a group known to have a high risk of developing obesity and have higher CVD mortality risk during adulthood than other racial/ethnic groups. The age was targeted at 8-10 years because during puberty body fat deposition accelerates in girls. Phase 1 was a 3-year pilot phase to conduct formative research and needs assessment which culminated in the conduct of pilot studies using a clinical trial design that included random assignment to an active treatment or a comparison control group. The intervention duration was 12 weeks. Four field centers and a coordinating center collaborated in Phase 1 to develop similar eligibility criteria, common key measurements in anthropometry, diet, physical activity, and psychosocial factors, and a common protocol and manual of operations. However, each field center developed and pilot-tested its own intervention. Target behaviors for the interventions were increased intake of fruits and vegetables and consumption of water; decreased intake of sweetened beverage; guidance on reducing fat intake and controlling calories; increased physical activity; decreased sedentary activities; and one center included in their intervention a program to specifically reduce TV viewing.

Baylor
4-week summer day camp program followed by an 8-week Internet program where girls were asked to log on once per week from home.

Minnesota
Weekly after-school sessions conducted at schools

Memphis
Weekly evening sessions conducted at community centers.

Stanford
Daily (on weekdays) after-school dance classes at community centers plus 5 home sessions to reduce TV viewing.

The number of girls enrolled at each field center ranged from 35 to 61. The studies were not powered to detect significant differences in BMI between the intervention and usual care groups. Changes in BMI in the hypothesized direction were observed at two centers (Memphis, Stanford). Changes in the hypothesized directions were observed across the four field centers among a number of dietary and physical activity behaviors, as well as psychosocial factors. Important features of the interventions included their community settings; family involvement; attempt to influence mediators of change; and flexibility to address barriers to intervention attendance. The pilot studies showed which interventions were promising and provided the investigators with the experience and data necessary to revise and refine promising interventions that would subsequently be used in full-scale trials during Phase 2.

Applying Theory and Methods of Community-Based Drug Abuse Prevention to Pediatric Obesity

Mary Ann Pentz, PhD, University of Southern California

Multiple community influences affect pediatric obesity, which could be considered risk factors to be targeted in a comprehensive pediatric obesity prevention program. These include, but are not limited to, community environmental influences of food marketing, and community norms about eating and exercise; local media coverage and ads about foods, exercise, and physical attractiveness; school influences ranging from food choices in cafeterias, peer food preferences, inadequate school programs on nutrition and health, and lack of opportunity for exercise; parent and family food preparation and exercise habits; and local policies regarding food pricing, athletic facilities, and other physical environments conducive to safe exercise. The Midwestern Prevention Project, or Project STAR, is a multi-component community-based prevention program that addresses community, media, school, parent, and policy influences on adolescent drug use and related problem behavior. This presentation reviews the theory underpinning community-based prevention, the programs used to address each influence, and the methods by which the programs are linked and mutually supported. Research and measurement designs, program content and training, analyses, and results are discussed for their relevance to the prevention of pediatric obesity. Particular attention is paid to potential risk, protective, and mediational factors that may be common across both drug abuse and obesity prevention.

Reducing Children's Screen Time to Prevent Obesity

Thomas N. Robinson, MD, MPH, Stanford University

It has been hypothesized that television viewing and other screen use causes obesity via one or more of three mechanisms: displacement of physical activity, increased calorie consumption while watching or due to the effects of advertising, and/or reduced resting metabolism. Many observational studies have demonstrated weak but consistent associations between screen viewing time and body mass index. The results of several recent experimental studies in school and family settings have demonstrated that reducing children's screen time can reduce weight gain, reduce the risk of obesity or help promote weight loss in obese children. One school-based experimental trial was specifically designed to directly test the causal relationship between reducing television, videotape and videogame use and body fatness. The results of this study provide evidence that reducing screen viewing time is an efficacious strategy for reducing weight gain in children. Recent and ongoing studies are exploring the specific mechanisms linking television and other screen viewing and weight gain. The cumulative experimental evidence linking reduced screen time to changes in BMI across several studies, populations and settings make it one of the most (if not the most) evidence-based strategies currently available for obesity prevention.

SPARK Programs for Physical Activity Promotion

James F. Sallis, PhD, San Diego State University

The SPARK (Sports, Play, and Active Recreation for Kids) study was an NHLBI-funded study of health-related physical education (PE) and self-management programs for elementary schools. Programs implemented by

- PE specialists or
- trained classroom teachers were compared to
- usual PE controls over 2 years.

There was evidence children enjoyed the PE program and it improved quality of PE teaching, quantity of PE, physical activity during PE, some components of fitness, sports skills, and possibly academic achievement. Though physical activity outside of school was not increased significantly, students who participated more in the self-management program reduced BMI and improved beliefs about physical activity. Trained classroom teachers maintained improved PE classes at least 18 months after the intervention ended. M-SPAN (Middle School Physical Activity and Nutrition) was an NHLBI-funded study of environmental changes to increase physical activity and reduce dietary fat intake at school. The PE intervention increased physical activity during class by about 20%. Efforts to increase physical activity after lunch and after school were partially effective. When adult supervision and access to equipment were increased, student physical activity increased, but implementation varied widely across schools. The nutrition intervention was not effective, but strong barriers to change were identified. The M-SPAN PE and Active Recreation programs are being disseminated. SPARK dissemination has been in operation for 10 years, and an independent evaluation indicated that most trained teachers continued to implement the program up to 4 years after training. Continuing challenges include teacher acceptance of the self-management curriculum, difficulty and time required to change school policies, and funding of evidence-based school physical activity promotion programs. *www.sparkpe.org*

School-Based Obesity Prevention Studies In Perspective

Mary Story, PhD, RD, University of Minnesota

Currently, few successful models exist for the prevention of child obesity. The most effective strategies will likely be those that affect both energy intake and energy expenditure. The most important settings to target for obesity prevention in children and adolescents are believed to be family and schools. Schools have the potential to make valuable contributions to obesity prevention efforts. More than 95% of youth, ages 5-17 are enrolled in school, and no other institution has as much continuous and intensive contact with children. The combination of classroom health education, physical education classes and recess, food service, health services, and family contact make schools a viable forum for providing both individual-level and environmental-level programs to improve eating and physical activity behaviors, and in turn prevent obesity. While most school-based obesity prevention efforts to date have not had significant effects on physiologic variables such as body weight, several school-based interventions have been shown to be effective in improving diet and physical activity levels of youth. Programs have been successful in implementing environmental changes, including reductions in fat content of school lunches, modifying the prices of fruits and vegetables in the school cafeteria and in vending machines. The results of these studies have shown that the availability, promotion, and pricing of foods in schools can be changed to support more healthful food choices. Studies have also shown that school PE classes can be changed to make them much more active and increase the time spent in PE and in moderate to vigorous activity. School-based studies have also found that reductions in television and video viewing reduced the prevalence of obesity in youth.

The second generation of school-based interventions to prevent obesity will need to build on the lessons learned from previous studies. The family environment is a critical influence in the development of childhood obesity. Combined school and family programs can deliver more benefits than those managed in isolation from each other. Also, community programs that include policy changes and media campaigns are more effective when combined with family and school components. We can also learn from other areas of youth health promotion and prevention programming. Weissberg et al (American Psychologist 58: 425-432, 2003) based on a review of the literature from 4 content areas (substance abuse, risky sexual behavior, school failure and juvenile delinquency and violence) identified 6 characteristics associated with effective prevention programs:

- Uses a research-based risk and protective factor framework that involves schools, families, peers, and communities as partners to target multiple outcomes
- Is long term, age specific, and culturally appropriate

Continued

- Fosters development of individuals who are healthy and fully engaged through teaching them to apply skills and values in daily life,
- aims to establish policies, institutional practices, and environmental supports that nurture optimal development,
- Selects, trains, and supports interpersonally skilled staff to implement programming effectively, and
- Incorporates and adapts evidence-based programming to meet local community needs through strategic planning, ongoing evaluation, and continuous improvement.

These characteristics have implications for obesity prevention programs.

Finally, our understanding of mediating and moderating variables that influence school-based program effects is limited. Research studies need to pay greater attention to process measures of program quality and fidelity, rather than focusing just on outcome evaluations. We need to know the implementation conditions and variations that maximize program impacts (Weissberg et al 2003). Also standardized common measures are needed to allow comparison of data across obesity prevention studies.

Results Of The Bienestar Diabetes Prevention Program

Roberto P. Treviño, MD, Social & Health Research Center

Recent studies are reporting an increasing number of low-income minority children being diagnosed with type 2 diabetes. Type 2 diabetes was once considered to be an adult onset disease and it was estimated that <5% of all children with diabetes were type 2. In San Antonio, Texas, however, 18% of all diabetic youth seen in a pediatric endocrinology clinic were identified as having type 2 diabetes. A recent school-based study also found that of 987 low-income fourth grade students examined, 4.6% had abnormal fasting capillary glucose levels (≥110 mg/dl). Common findings in diabetic youth are that most were minority, most were overweight, most were unaware of their disease and all came from low-income households.

Table 1: Mean FCG Levels for Three School Years

Students with Abnormal FCG (≥110 mg/dl)	Baseline August	Follow-Up May	P Value
1999-2000: n=9	117± 5.2	93±19.1	p<.05
2000-2001: n=43	123 ±17	99 ±9	p<.001
2001-2002: n=42	121+16	91+13	p<.01

The Bienestar *(Well-being)* Health Program is a bilingual coordinated school-based diabetes prevention program. The Bienestar consists of creating a network of social support for children to decrease fatty foods, to increase fiber foods, to increase physical activity and to control body weight. Systems selected to provide the social support are the home, the school, the school cafeteria and the after-school care. The Bienestar, therefore, consist of the Bienestar Parent Fun Fiesta, the Bienestar Health and Physical Education Class, the Bienestar Health Club, and the Bienestar School Food Service.

Bienestar students, when compared to non-participating students, have significantly decreased their fat intake, have increased their fiber intake, and have increased their physical fitness levels. For three consecutive years, the Bienestar has restored normoglycemia in children with abnormal FCG levels *(Table 1)*. These results suggest that early-age intervention may be the best approach to controlling diabetes in at-risk populations.

The Bienestar, presently, is being evaluated in a randomized clinical trial where children will be followed for 4 years. This study began in the fall of 2001 with near 700 students (72% response rate) in each arm (intervention and control) of the study. The NIH-funded randomized controlled trial showed that children participating in the Bienestar were twice as likely to avoid the disease than children in the control (1.5% Bienestar vs. 3.1% control; p<.05). Type 2 diabetes in children is a rising medical problem and the Bienestar is a program showing to reverse hyperglycemia in diabetic children and to prevent hyperglycemia in at-risk children.

CATCH: A Coordinated Approach to Child Health

Larry S. Webber, PhD, Tulane University School of Public Health and Tropical Medicine

CATCH: A Coordinated Approach to Child Health (formerly known as the Child and Adolescent Trial for Cardiovascular Health) was a school- and family-based program to improve behaviors that are related to cardiovascular health. The program was funded from 1987 until 2000 in five phases: feasibility and pilot (Phase I), main trial (Phase II), tracking (Phase III), institutionalization (Phase IV), and homocysteine tracking (Phase V). The study was conducted in 96 schools at four sites in the United States. The intervention consisted of classroom curricula for 3rd through 5th grades, physical education enhancements, school food service modification, and family programs. Results from the main trial showed that the percent of calories from fat was reduced in school lunch in intervention schools (31.9%) compared to control schools (36.2%) and that the percentage of physical education class devoted to moderate to vigorous physical activity (MVPA) increased more in intervention compared to control schools. In addition, the percentage of total daily calories from fat and saturated fat was lower in children from intervention schools (30.3% and 11.4% respectively) compared to children from control schools (32.2% and 12.1% respectively). Similarly, children from intervention schools had a greater number of daily minutes of vigorous activity (58.6) than children from control schools (46.5). Three years after the intervention, these differences in total daily intake and activity between children from intervention and control schools were smaller but still statistically significant. Five years after the intervention ended, menus from half of the former intervention schools met the CATCH guidelines for fat compared to only 10% of the former control schools. There were no significant differences in implementation of CATCH PE goals between schools in the two conditions. The time spent teaching CATCH curricula was slightly greater in former intervention compared to former control schools. Changes in the school environment to support healthful behaviors can be maintained over time; however, policy changes at the district level along with on-going staff training are essential for long-term maintenance.

Creating a Healthy School Environment

Howell Wechsler, EdD, MPH, Center for Disease Control and Prevention

This presentation will describe the CDC's *School Health Index: A Self-Assessment and Planning Guide* (SHI): its structure and implementation process, extent of use in U.S. schools, impact on school policies and environment, research conducted to date on the SHI; and potential areas of future research. SHI enables schools to identify the strengths and weaknesses of their health promotion policies and programs, and develop an action plan for improving student health. The third edition of SHI, released in June 2004, addresses school policies and programs related to physical activity and nutrition, as well as tobacco use and injury prevention. SHI features a community organizing approach by involving teachers, parents, students, school administrators, and interested community members in assessing and improving the school health environment. The tool encourages a comprehensive approach to improving student health by featuring 8 assessment modules that correspond to the 8 components of CDC's Coordinated School Health Program Model (health policies and environment; health education; physical education and physical activity programs; nutrition services; health services; counseling, psychological, and social services; staff health promotion; and family and community involvement). The SHI assessment items are derived from CDC's school health guidelines documents, which are based on an extensive review of research and expert analysis. Therefore, completing the tool educates school community members about state-of-the-art, research-based recommendations for effective school policies and practices to promote health-enhancing behaviors.

The SHI process allows school teams to identify and prioritize for themselves the strategies they will adopt to improve their SHI scores and guides them through a planning process to implement changes in the school health environment. This process is designed to foster community ownership of environmental changes, which might increase the chances that changes will be effectively implemented and maintained. SHI has been used in at least 46 states, with some states reporting its use in hundreds of schools. A number of states provide mini-grants to help schools implement their SHI action plans. Evaluating the SHI is challenging because it is a process, not a packaged intervention, that will result in a different set of program and policy changes in every school that uses it. To date, studies on the effects of the use of SHI on the school health environment have taken a qualitative, case study approach. The role of SHI, a community organizing, comprehensive environmental change process, in childhood obesity prevention remains to be seen.

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