

School Health Guidelines to Promote Healthy Eating and Physical Activity



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School Health Guidelines to Promote Healthy Eating and Physical Activity

Prepared by
*Division of Adolescent and School Health,
 National Center for Chronic Disease Prevention and Health Promotion*

Summary

During the last 3 decades, the prevalence of obesity has tripled among persons aged 6–19 years. Multiple chronic disease risk factors, such as high blood pressure, high cholesterol levels, and high blood glucose levels are related to obesity. Schools have a responsibility to help prevent obesity and promote physical activity and healthy eating through policies, practices, and supportive environments.

This report describes school health guidelines for promoting healthy eating and physical activity, including coordination of school policies and practices; supportive environments; school nutrition services; physical education and physical activity programs; health education; health, mental health, and social services; family and community involvement; school employee wellness; and professional development for school staff members. These guidelines, developed in collaboration with specialists from universities and from national, federal, state, local, and voluntary agencies and organizations, are based on an in-depth review of research, theory, and best practices in healthy eating and physical activity promotion in school health, public health, and education. Because every guideline might not be appropriate or feasible for every school to implement, individual schools should determine which guidelines have the highest priority based on the needs of the school and available resources.

Background

Healthy eating and regular physical activity play a substantial role in preventing chronic diseases, including heart disease, cancer, and stroke, the three leading causes of death among adults aged >18 years (1–5). Poor diet and physical inactivity among younger persons can lead to an increased risk for certain chronic health conditions, including high blood pressure, type 2 diabetes, and obesity (1). During 2007–2008, 20% of U.S. children aged 6–11 years and 18% of persons aged 12–19 years were obese, percentages that have tripled since 1980 (6). Engaging children and adolescents in healthy eating and regular physical activity can lower their risk for obesity and related chronic diseases (7,8).

The dietary and physical activity behaviors of children and adolescents are influenced by many sectors of society, including families, communities, schools, child care settings, health-care providers, faith-based institutions, government agencies, the media, and the food and beverage industries and entertainment industry. Each of these sectors has an important, independent role to play in improving the dietary and physical activity

behaviors of young persons. Schools play a particularly critical role by establishing a safe and supportive environment with policies and practices that support healthy behaviors. Schools also provide opportunities for students to learn about and practice healthy eating and physical activity behaviors.

Introduction

In response to the childhood obesity epidemic, much research has been conducted on school-based obesity prevention and healthy eating and physical activity promotion and intervention since the last publication of the *Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People* (1997) and the *Guidelines for School Health Programs to Promote Lifelong Healthy Eating* (1996). The new guidelines in this report synthesize the scientific evidence and best practices during 1995–2009 and combine healthy eating and physical activity into one set of evidence-based guidelines for schools serving students in kindergarten through 12th grade (grades K–12); other educational programs within schools, such as prekindergarten, might also be able to apply these guidelines in their settings. These guidelines support the 2010 *Dietary Guidelines for Americans* (5), the 2008 *Physical Activity Guidelines for Americans* (9), and the *Healthy People 2020* objectives related to healthy eating and physical activity among children and adolescents and schools (10). The guidelines establish a foundation for developing, implementing, and evaluating school-based healthy eating and physical

The material in this report originated in the National Center for Chronic Disease Prevention and Health Promotion, Ursula E. Bauer, PhD, Director

Corresponding preparer: Sarah M. Lee, PhD, CDC, National Center for Chronic Disease Prevention and Health Promotion, 4770 Buford Hwy NE, MS K-12, Atlanta, GA 30341. Telephone: 770-488-6126; Fax: 770-488-5771; E-mail: skeuplee@cdc.gov.

activity policies and practices for students (Appendix A). Each of the nine guidelines is accompanied by a series of strategies for schools to implement.

The primary audience for this report includes state and local education and health agencies, federal agencies, and national nongovernmental organizations that focus on the health of students in school. Agencies can use these guidelines to establish professional development materials, programs, and resources for partners and constituents. Locally, physical education and health education teachers, school nutrition directors, school health councils, and other school staff members; health-care providers; community members; policy makers; parents; and students can use these guidelines to establish, implement, and assess healthy eating and physical activity policies and practices in schools. Finally, faculty members in institutions of higher education can use these guidelines to teach students of school health, public health, physical education, health education, exercise and wellness, physical activity, dietetics, nutrition education, nursing, elementary and secondary education, and other health- and education-related disciplines.

Methods

This report updates and combines the previously published *Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People* (1997) and *Guidelines for School Health Programs to Promote Lifelong Healthy Eating* (1996) (11,12). The current guidelines and the corresponding strategies and actions were developed through a synthesis of scientific reports and expert opinion about effective and feasible practices in U.S. schools. Development of the guidelines involved an extensive literature search, development and use of a codebook by CDC staff members for rating the sufficiency of the scientific evidence and expert opinion, and an external review by approximately 50 organizations and persons in the fields of school health, education, public health, nutrition, and physical activity. (A list of these technical advisors is provided on page 76.) The use of practice-based expert opinion refines research-based guidelines to ensure that recommendations are accessible, given limited funding and resources; credible, allowing them to be implemented in various school settings and communities; and reasonable in terms of the expectations they set for professional practice and health outcomes (13).

Literature Search and Inclusion Criteria

CDC scientists conducted an extensive search for scientific reports, using five electronic citation databases: Medline, Cinahl, Sports Discus, PsychInfo, and ERIC. The coordinated

school health approach was used to organize the literature search results for school-based nutrition and physical activity as they related to a healthy and safe school environment; nutrition services; physical education and school-based physical activity; health education; health services and counseling, psychological and social services; family and community involvement; and health promotion for staff members.

Scientific reports were included if they described practices to improve child and adolescent nutrition and physical activity that were based in schools or that addressed family or community involvement in schools. Two overall types of scientific reports were used to identify the new guidelines and corresponding strategies and actions: 1) reports that included cross-sectional, prospective, and randomized controlled trials that were designed to improve healthy eating and physical activity and prevent youth obesity and to promote wellness among school employees and 2) expert statements that included opinions, commentaries, or consensus statements from public health and education organizations or agencies about youth nutrition, physical activity, or obesity prevention. Scientific reports were included if they were published during 1995–2009 to update and expand on research described in the previous guidelines. Epidemiologic and surveillance data also were used to develop the introductory text.

Reports were excluded from consideration if they included only preschool children or college-age or older adults, were not in English, described clinical trials for weight-loss drugs or other nonbehavioral methods for weight loss, primarily addressed mental health issues such as eating disorders, or described interventions to improve performance in a specific sport or to improve functional ability after illness or injury.

A total of 6,213 abstracts were screened to identify full scientific reports to be retrieved. A total of 1,325 full scientific reports and expert statements were retrieved and reviewed for consideration in the guidelines.

Characteristics of Scientific Reports

A team of four CDC scientists used a database to record descriptions of each of the 1,325 scientific reports and expert statements, including health topics (e.g., nutrition, physical activity, and obesity prevention); component of the coordinated school health framework (e.g., physical education and health education); setting of the intervention (e.g., school, district, and community or county level); geographic location; age, sex, race/ethnicity, socioeconomic status, and health condition of participants; and topic of the report (e.g., policy and curricula). For reports describing evaluation studies, CDC scientists identified and documented the sample size, demographic makeup of study participants, duration of study,

method of group assignment (e.g., random, quasiexperimental, or single group); length of follow-up after baseline measures; and outcomes of the study, such as impact on participant knowledge, attitude, behavior, or health status. Expert statements were described by type of statement (e.g., expert group statement, best practices document, or position statement), who convened the statement process, who funded the statement process, the nature of the convening group (e.g., established organization, ad hoc committee, federally sponsored committee, or CDC-funded grantee), and how evidence was presented in the expert statement.

Rating Sufficiency of Evidence

After describing the characteristics of evaluation studies and expert statements, four CDC staff members rated the relevance of each for inclusion in the guidelines. Each study and expert statement was read, and its evidence was rated. For scientific reports, the rating process focused on rigor, confidence in the findings, efficacy, and feasibility. For expert statements, the rating process focused on the organization that published or wrote the report, conflicts of interest, and evidence to support the statement.

Scientific Reports

Scientific reports were included if they had a rigorous study design with, at a minimum, a matched comparison group, strong study methods that contributed to confidence in the results, evaluation efficacy that included one or more positive results, and feasibility of implementing the intervention rated as medium or better. All four categories had to be rated as acceptable for a study to be included in the review for this guideline document.

In addition to the review of research and evaluation studies, CDC staff members identified, collected, and considered for inclusion all relevant reports from the Task Force on Community Preventive Services. Three task force reports on nutrition, physical activity, and obesity were relevant (i.e., applicable to school settings) and included recommendations from the task force.

Expert Statements

Best practice documents, position statements of individual persons or on behalf of organizations, and convened expert panels that covered topics related to youth physical activity and nutrition were included in the expert statements that were read and rated for sufficiency of evidence. Expert statements were included if 1) the experts had no conflicts of interest (i.e., financial support was reported and was provided by a federal agency or federal agency sponsor, a national non-governmental organization such as the American Academy

of Pediatrics, National Association for Sport and Physical Education, or American Dietetic Association, or a state-level health or education department); 2) the convening group was an established organization, federally sponsored committee, or a partner funded by the CDC Division of Adolescent and School Health; and 3) the expert statements could be associated with an evidence base (e.g., literature review and synthesis or meta-analysis).

Coding and Synthesis

To ensure standardized and reliable coding, four CDC staff worked in pairs to rate a subset of 40 reports. Discrepancies among coders were resolved through group discussion and consensus. The 1,325 scientific reports and expert statements were coded and categorized by each component for coordinated school health: healthy and safe school environment; nutrition services; physical education and school-based physical activity; health education; health services and counseling, psychological, and social services; family and community involvement; and school employee wellness. The CDC staff members concluded that there was enough scientific evidence on school-based nutrition and physical activity for each component of the coordinated school health framework to be an independent guideline. Furthermore, the CDC staff members identified enough scientific evidence to support the inclusion of two additional guidelines: 1) using a coordinated approach for nutrition and physical activity policies and practices and 2) professional development for school staff members. After identifying each guideline, the CDC staff members reviewed the scientific reports again to identify common strategies and actions within each guideline that resulted in positive associations with student knowledge, attitude, behavior, or health outcomes related to physical activity, diet, weight, or chronic disease risk factors. Expert statements also were reviewed for strategies and actions that are supported by opinions, commentaries, or consensus statements from public health and education organizations or agencies about youth nutrition, physical activity, or obesity prevention. Ultimately, 255 research and evaluation studies and 112 expert statements were rated as presenting evidence of sufficient relevance for a strategy or action to be included in the revision of the guidelines. An additional 343 descriptive articles were included in the document to support the background information (e.g., epidemiologic and surveillance data) included in the introduction and within each guideline.

Expert Input

In addition to the literature search and rating the sufficiency of the evidence, CDC convened a group of 10 experts in youth nutrition, physical activity, school health, school food service,

education, and public health to review the scientific evidence and to provide individual input on proposed revisions of the guidelines. Input from the individual experts on the nine guidelines and corresponding strategies and actions were reviewed and integrated into the guidelines. CDC also garnered input from 53 federal and state education and public health agencies, as well as from nongovernmental organizations that represented policy makers, educators, parents, students, school nurses, physicians, and other health-care providers. Each of the 53 agencies provided a review of the guidelines and proposed revisions. The revised version was sent for review and revision to three experts in the field of school-based nutrition and physical activity who had not previously reviewed the document.

Epidemiologic Aspects of Healthy Eating and Physical Activity

Long-Term Outcomes of Healthy Eating and Physical Activity

This report was developed in response to the long-term and intermediate outcomes associated with inadequate physical activity and unhealthy eating. Healthy eating and physical activity have been associated with increased life expectancy, increased quality of life, and reduced risk for many chronic diseases (9,14–16). Healthy living through healthy eating and regular physical activity reduces the risk for the top three leading causes of death in the United States (heart disease, cancer, and stroke), as well as for certain chronic conditions, such as high blood pressure and type 2 diabetes (1,2,17).

Cardiovascular Disease

Cardiovascular disease (CVD) includes coronary heart disease, myocardial infarction, congestive heart failure, stroke, and other diseases and illnesses of the heart and blood vessels. Heart disease is the leading cause of death in the United States, and stroke is the third leading cause (18). Adult population subgroups disproportionately affected by CVD and its related risk factors include blacks, Hispanics, Mexican-Americans, and persons of low socioeconomic status (19). A healthy diet and regular physical activity can prevent and reduce metabolic risk factors that cause CVD, including hyperlipidemia (e.g., high cholesterol and triglyceride levels), high blood pressure, obesity, and insulin resistance and glucose intolerance (2,9,20). For example, dietary fiber can decrease the cholesterol concentration in the blood (21), and physical activity can help maintain normal blood glucose levels (9).

Studies indicate that CVD risk factors occur more frequently in obese children. Data from 2003–2006 National Health and

Nutrition Examination Survey (NHANES) indicated that 3% of children and adolescents aged 8–17 years had increased blood pressure and that this risk was significantly greater among those who were obese (8%) (22). In a community-based sample of obese children aged 5–17 years, 70% had at least one CVD risk factor, such as a high cholesterol or triglyceride level, high blood pressure, or high insulin level, and 39% had two or more risk factors (23). However, among children of normal weight, 26% had at least one risk factor, and 13% had two or more risk factors (23).

Cancer

Cancer is the second leading cause of death in the United States, and black adults have a higher incidence rate of cancer than persons of any other racial/ethnic group (18,24). Some types of cancer can be prevented through regular physical activity and a diet consisting of various healthy foods with an emphasis on plant sources (e.g., fruits, vegetables, and whole grains) (17). A diet rich in plant foods is associated with a decreased risk for lung, esophageal, stomach, and colorectal cancer (17). Dietary factors that influence cancer risk include food type, variety, preparation, portion size, and fat content (17,25). Excess consumption of processed and red meats is associated with an increased risk for colorectal and prostate cancer (17).

Physical activity might contribute to cancer prevention through its role in regulating the production of hormones, boosting the immune system, and reducing insulin resistance (9). Regular physical activity can reduce the risk for developing cancers of the breast and colon, and some evidence indicates that physical activity can reduce the risk for developing endometrial and lung cancers (9). Healthy eating and physical activity also can contribute to cancer prevention by preventing obesity (9). Overweight and obesity are associated with increased risk for numerous types of cancer, including cancer of the breast, colon, endometrium, esophagus, kidney, pancreas, gall bladder, thyroid, ovary, cervix, and prostate, as well as multiple myeloma and Hodgkin's lymphoma (17).

Diabetes

Diabetes, a disease characterized by high blood glucose levels (26), was the seventh leading cause of death in the United States in 2007 (18). Diabetes is the leading cause of kidney failure, nontraumatic lower-extremity amputations, and new cases of blindness among adults and can affect the nervous system and oral health (26). Persons with diabetes have a two to four times higher risk for dying from CVD than those without diabetes (27,28). Diabetes is a result of defects in insulin production, insulin action, or both and is classified as either type 1 (insulin-dependent diabetes) or type

2 (usually non-insulin-dependent diabetes) (26). Although diet and physical activity can help control blood glucose levels and reduce complications from both types of diabetes, type 1 diabetes is an autoimmune disease of the pancreas, and little is known about prevention (29). In 2001, the prevalence of type 1 diabetes among a sample of U.S. persons aged 10–19 years was 2.28 cases per 1,000 persons (30).

Type 2 diabetes is the most common form of diabetes in adults (26). Healthy eating and regular physical activity can help prevent this type of diabetes (29,31,32). Type 2 diabetes was previously observed primarily among adults but has become more common among children and adolescents (26,29). In 2001, the prevalence of type 2 diabetes in a sample of U.S. persons aged 10–19 years was 0.42 cases per 1,000 persons (30) and was greatest among Asian/Pacific Islander, black, Hispanic, and American Indian persons (33). In the Pima Indian community, type 2 diabetes in children and adolescents aged 5–14 years increased significantly from 0.5 cases per 1,000 person-years in 1965–1977 to 3.3 cases per 1,000 person-years in 1991–2003 (32). According to the 2005–2006 NHANES, 16% (overall) of persons aged 12–19 years and 30% of obese persons aged 12–19 years had prediabetes, a condition in which blood glucose levels indicate a high risk for development of diabetes (26,34).

Intermediate Outcomes of Healthy Eating and Physical Activity

Poor diet and physical inactivity are risk factors for numerous conditions that affect overall health and quality of life, and many of these conditions can lead to chronic diseases. Intermediate outcomes such as obesity, metabolic syndrome, inadequate bone health, undernutrition, iron deficiency, eating disorders, and dental caries can begin in childhood, leading to earlier onset of disease and subsequent premature death.

Obesity

Healthy eating and physical activity control body weight through a balance of energy expenditure and caloric consumption (35). Weight gain occurs when persons expend less energy through physical activity than they consume through their diet (35). As this imbalance continues over time, the risk for overweight and obesity increases (35). Overweight is defined as having excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors (36). Obesity is the condition of excess body fat (37). Body mass index (BMI) is a ratio of weight and height (kilograms/meters²) and is the most widely used and recommended measure to estimate weight status. In adults, weight status is determined directly by BMI. Among adults aged ≥ 20 years, overweight

is classified as BMI ≥ 25 to < 30 kg/m²; obesity is classified as BMI ≥ 30 kg/m². Weight status in persons aged 2–19 years is determined by comparing their BMI to other persons of the same sex and age in a reference population. BMI is calculated and plotted by age on a sex-specific growth chart to determine a BMI-for-age percentile. Among persons aged 2–20 years, overweight is classified as BMI ≥ 85 th to < 95 percentile for age and sex; obesity is classified as BMI ≥ 95 th percentile for age and sex (38).

In 2008, the prevalence of obesity among children aged 6–11 years was 20%, nearly triple the prevalence in 1980 (7%) (6,39–41). The rate among persons aged 12–19 years more than tripled over the same period, increasing from 5% to 18% (6,39–41). A *Healthy People 2020* national health objective (nutrition and weight status [NWS]) is to reduce the proportion of children aged 6–11 years who are obese to 16% and reduce the proportion of persons aged 12–19 years who are obese to 16% by 2020 (objectives NWS 10.2 and NWS 10.3).

Since 1980, blacks aged < 20 years have experienced greater BMI increases than both white and Mexican-American persons of the same age (42). During 2007–2008, non-Hispanic black females aged 2–19 years had significantly higher odds of being obese (23%) compared with non-Hispanic white females (15%); Hispanic males aged 2–19 years had significantly higher odds of being obese (24%) compared with non-Hispanic white males (16%) (6). Other evidence suggests that childhood obesity is significantly more common in American Indian/Alaska Native children than in white or Asian children (43). In addition, a greater percentage of adolescents from families in poverty are obese (23%) compared with those from families not in poverty (14%) (44). (Poverty is determined by the poverty-income ratio, which is the ratio of a family's income to the U.S. Census Bureau's poverty threshold. The threshold varies with the number and ages of family members and is revised yearly.)

Obesity in children and adolescents is associated with numerous immediate health risks, including high blood pressure, high blood cholesterol levels, type 2 diabetes, metabolic syndrome, sleep disturbances, orthopedic problems, and social and psychological problems, such as discrimination and poor self-esteem (7,35,45). These immediate health risks can have long-term consequences for children and adolescents, affecting them into adulthood. Insufficient public health and education efforts to decrease or minimize these health risks will affect both health-care and education systems.

Increasing rates of obesity among children and adolescents are of particular concern because those who are obese are more likely to become overweight or obese adults and have related chronic diseases (8). The probability of childhood obesity persisting into adulthood increases as children enter adolescence

(46,47); even obesity during early childhood (ages 2–5 years) increases the risk for adult obesity (47–49). For example, a community-based study found that among boys aged 9–11 years, 4% of those with a childhood BMI <50th percentile (normal weight) and 22% of those with a childhood BMI of 50th–84th percentile (normal weight) became obese adults, whereas 76% of those who were obese (BMI ≥95th percentile) became obese adults. The findings were consistent for both sexes and all childhood age groups studied in the cohort (2–5 years, 6–8 years, 9–11 years, 12–14 years, 15–17 years) (47). Obesity in adults is associated with an increased risk for premature death, heart disease, type 2 diabetes, stroke, several types of cancer, osteoarthritis, and many other health problems (8,50). The risk factors and precursors to these diseases are being detected in obese children (23), and national concern exists that this trend might lower the age of onset of chronic conditions and diseases and possibly decrease the quality of life or shorten the lifespan of obese children (51).

Metabolic Syndrome

Metabolic syndrome is a clustering of metabolic risk factors that increases the risk for prematurely developing CVD and type 2 diabetes (52). Metabolic syndrome is defined as the presence of three or more of the following metabolic risk factors: abdominal obesity, high triglyceride levels, low high-density lipoprotein cholesterol (HDL-C) levels, high blood pressure, and high fasting glucose levels (52). Physical inactivity and obesity are established risk factors for metabolic syndrome, and a poor diet can accelerate the risk for developing CVD among persons with metabolic syndrome (52). A total of 27% of U.S. adults in 2004 (53) and 9% of adolescents in 2010 had metabolic syndrome (54), with Hispanic males having the highest prevalence among adolescents (54). In 2003, metabolic syndrome was significantly more prevalent among obese persons than among those of normal weight (55).

Inadequate Bone Health

According to the 2004 Surgeon General's report on bone health and osteoporosis, diet and physical activity are responsible for 10%–50% of bone mass and structure (56). Adequate calcium and vitamin D intake, along with weight-bearing physical activity (e.g., walking, jogging, and weightlifting), provide bones with proper support for healthy growth. Physical activity places a mechanical load on the skeleton, and the body responds by strengthening bone mass to support the activity. In addition, both vitamin D and regular physical activity enhance the positive effects of calcium (56).

Bone growth during adolescence is particularly crucial for achieving optimal bone health because bone mass peaks in late adolescence (56,57). Adolescents who do not achieve optimal

bone mass during this period will lack the adequate support to sustain normal losses of bone mass later in life. Low body weight, weight loss, physical inactivity, and dieting among children and adolescents can lead to low bone density. Low bone density leads to osteoporosis, which is the most common cause of fractures among adults. In older adults, fractures lead to physical disabilities, depression, reduced quality of life, and potentially death (56,57). In 2004, approximately 10 million U.S. adults aged >50 years had osteoporosis, and an additional 33 million U.S. adults had the precursor condition, osteopenia (low bone mass). These conditions disproportionately affect women (56). In addition, obesity in children and adolescents is associated with orthopedic complications such as fractures, musculoskeletal pain, impairment in mobility, and abnormal lower extremity alignment (58).

Food Insecurity

Reduced food intake and disrupted eating patterns because a household lacks money and other resources for food is referred to as food insecurity. In 2008, approximately 49.1 million persons in the United States lived in food-insecure households, including 16.7 million children and adolescents, or 23% of all U.S. children and adolescents (59). Blacks and Hispanics have the highest prevalence of undernutrition (60), and food insecurity and hunger might be associated with lower dietary quality and undernutrition in children and adolescents, especially in adolescents (61). Undernutrition can have lasting effects on overall health, cognitive development, and school performance (62–65). Children and adolescents in food-insecure households have poorer health status and experience more frequent stomachaches and headaches than those from food-secure households (62). In addition to poor health outcomes, behavioral and psychosocial problems also have been associated with food insecurity and hunger in children and adolescents (62–64,66). Those who are food insecure have lower physical functioning and quality of life (67).

Children and adolescents experiencing hunger have lower math scores and are more likely to repeat a grade in school and receive special education services or mental health counseling than those not experiencing hunger (62,63). Children and adolescents experiencing hunger also are more likely to be absent and tardy from school than other children and adolescents (64). Schools have a long history of seeking out and developing strategies to address these concerns. The National School Lunch Program and School Breakfast Program were initiated, in part, as a way to reduce undernutrition among children and adolescents (68).

Iron Deficiency

Iron deficiency is a condition resulting from too little iron in the body (69). Iron deficiency hampers the body's ability to produce hemoglobin, which is needed to carry oxygen in the blood. This deficiency can increase fatigue, shorten attention span, decrease work capacity, impair psychomotor development, affect physical activity, and reduce resistance to infection (70,71). Iron deficiency ranges from depleted iron stores without functional or health impairment to iron deficiency with anemia, which affects the functioning of several body systems (70). To prevent iron deficiency, children and adolescents need to consume adequate amounts of foods containing iron (e.g., meat, poultry, egg yolk, dried fruit, dried peas and beans, nuts, green leafy vegetables, whole grain breads, and fortified cereals), as well as foods high in vitamin C (e.g., citrus fruits, tomatoes, melons, peppers, greens, cabbage, broccoli, strawberries, kiwis, and potatoes), to help the body absorb iron efficiently (70). Among school-age children and adolescents with iron deficiency, anemia is associated with poor cognition and lower academic performance (72,73). Whether this association exists among iron-deficient children and adolescents without anemia is unclear (73).

A *Healthy People 2020* national health objective strives to reduce iron deficiency among young children (aged 1–4 years) and females of childbearing age (aged 12–49 years) (objective NWS 21) (10). Among females aged 12–19 years, the prevalence of iron deficiency is 9% (74). In a national sample, children and adolescents who were overweight or obese were approximately twice as likely to be iron deficient than those of normal weight (75).

Eating Disorders

Eating disorders are psychological disorders characterized by severe disturbances in eating behavior. Anorexia nervosa is characterized by a refusal to maintain a normal body weight. Bulimia nervosa is characterized by repeated episodes of binge eating followed by compensatory behaviors such as self-induced vomiting (76). Disorders that do not meet all criteria for either anorexia nervosa or bulimia nervosa are referred to as eating disorders not otherwise specified.

Eating disorders are more common in females than males. Among females, the lifetime prevalence of anorexia nervosa is approximately 0.5%, and the lifetime prevalence of bulimia nervosa is 1%–3% (76). The prevalence of anorexia nervosa and bulimia nervosa in males is approximately one tenth that in females.

According to the American Psychiatric Association, the prevalence of anorexia nervosa and bulimia nervosa in U.S. children and younger adolescents is not well documented

(77). However, children and adolescents report disordered eating behaviors that are clinically severe but do not meet full criteria for an eating disorder. For example, in 2009, in a nationally representative sample of high school students, 11% of students had gone without eating for >24 hours; 5% had taken diet pills, powders, or liquids without a physician's advice; and 4% had vomited or taken laxatives to lose weight or to keep from gaining weight during the 30 days before the survey (78). Eating disorders can cause severe complications, and mortality rates for these disorders are among the highest for any psychiatric disorder (79).

Dental Caries

Dental caries is the most common chronic condition in children and adolescents, with the greatest prevalence in blacks and Mexican-Americans and in those who live in poverty (80). Pain from untreated caries can affect school attendance, eating, speaking, and subsequent growth and development (80). Dental caries is associated with sugar and full-calorie soda consumption (80,81). Children who are obese have been found to have higher rates of dental caries than their normal weight peers (82).

Healthy Eating Recommendations

The *Dietary Guidelines for Americans* have been published every 5 years since 1980 (5). These guidelines provide authoritative advice for persons aged ≥ 2 years on establishing dietary habits that promote health and reduce the risk for chronic disease. The guidelines recommend a diet rich in fruits and vegetables, whole grains, and fat-free and low-fat dairy products for persons aged ≥ 2 years. The guidelines also recommend that children, adolescents, and adults limit intake of solid fats (major sources of saturated and trans fatty acids), cholesterol, sodium, added sugars, and refined grains (5). National health objectives include increasing the consumption of fruits, vegetables, whole grains, and calcium among persons aged ≥ 2 years, reducing consumption of calories from solid fats and added sugars, reducing consumption of saturated fats, and reducing sodium consumption (objectives NWS-14 through NWS-21) (10).

Eating Behaviors of Children and Adolescents

Available data indicate that most children and adolescents do not follow critical dietary guidelines. For example, the 2010 guidelines provide guidance on the amount of fruits and vegetables that children and adolescents should consume. The recommendation for persons aged 5–18 years is 2½–6½ cups of fruits and vegetables each day, depending on age and calorie requirements (5). However, most U.S. children and adolescents

do not follow the recommendations for the numbers of daily servings or variety consumed (3). Furthermore, according to the 2009 national Youth Risk Behavior Survey (YRBS), only 22% of students in grades 9–12 reported consuming fruits and vegetables five or more times per day (78). The guidelines also recommend that children aged 4–8 years drink 2 cups of fat-free or low-fat milk or equivalent milk products per day and persons aged 9–18 years drink 3 cups per day (i.e., 1,300 mg/day), yet most children and adolescents do not drink the recommended amounts (3). A total of 15% of students in grades 9–12 drank three or more glasses of milk per day in 2009 (5,78). During 2007–2008, females aged 12–19 years had a particularly low intake of calcium, consuming an average of 878 mg of calcium daily, which is 67% of the recommended dietary allowance (5,83). In addition, from the 1970s through the mid-1990s, milk consumption among female adolescents decreased 36% (84).

The guidelines recommend that children and adolescents consume at least half of their daily grain intake as whole grains, which for many people is 2- to 3-oz equivalents, depending on age, sex, and calorie level (5). Whole grains are an important source of fiber and other nutrients. Persons aged 4–18 years do not eat the minimum recommended amounts of whole grains. During 2001–2004, the median intakes of whole grains in this age group ranged from 0.26–0.48 oz, far less than the recommended amounts (3).

During 2007–2008, the average percentage of calories from fat consumed by persons aged 6–19 years was 33%. Although these percentages are similar to those suggested by the dietary guidelines for total fat consumption (25%–35% of total calories), persons aged 6–19 years consumed more than the recommended amount of saturated fat (10% of total calories), ranging from 11%–12% (5,83).

Sodium intake, which is associated with increased blood pressure (85), has increased steadily during the last 35 years, in large part because of increased consumption of processed foods such as salty snacks and increased frequency of eating food away from home (84). The guidelines recommend a maximum daily intake of sodium of 2,300 mg or 1,500 mg, depending on age and other individual characteristics. African Americans; persons with hypertension, diabetes, or chronic kidney disease; and persons aged ≥ 51 years should have a sodium consumption of $< 1,500$ mg/day. These groups make up approximately half of the U.S. population aged ≥ 2 years. However, almost all persons in the United States consume more than the recommended amount of sodium. During 2007–2008, boys aged 6–11 years and 12–19 years had an average daily sodium intake of 3,169 mg and 3,990 mg, respectively. Girls aged 6–11 and 12–19 years had an average daily sodium intake of 2,717 mg and 3,013 mg, respectively (83).

Although the dietary guidelines do not have a recommendation for the maximum daily intake for added sugar, they do recommend that persons reduce their intake of added sugars (5). Children and adolescents tend to have diets high in added sugar (84), with added sugar contributing approximately 18% of their total daily calories (86). Sugar-sweetened beverages (such as soda and fruit drinks) are major contributors to added sugar consumption and contribute an average of 8% of energy intake among persons aged 2–18 years (86). Males aged 12–19 years consume an average of 22.0 oz of full-calorie soda per day, more than twice their intake of fluid milk (9.8 oz); females consume an average of 14.3 oz of full-calorie soda and 6.3 oz of fluid milk (87). Because many foods and beverages with added sugar tend to contain few or no essential nutrients or dietary fiber, the guidelines advise that one way to reduce intake of added sugar is to replace sweetened foods and beverages with those that are free of or low in added sugars (5). In addition, empty calories from added sugar and solid fats contribute 40% of daily calories for persons aged 2–18 years, affecting overall diet quality (86). Approximately half of these empty calories come from six sources, which include soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk (86).

The guidelines recommend that persons in the United States, including children and adolescents, strive to achieve and maintain a healthy body weight. Specifically, children and adolescents are encouraged to maintain the calorie balance needed to support normal growth and development without promoting excess weight gain (5). During 1971–2000, a significant increase in caloric intake occurred in the United States (88). Changes in energy intake among children and adolescents varied by age. Studies indicate that the overall energy intake among children (aged 2–5 and 6–11 years) remained relatively stable from 1971 to the late 1990s and 2000 (84,89,90). However, the energy intake among persons aged 12–19 years increased significantly during the same period (84,90,91).

Factors that Influence the Eating Behaviors of Children and Adolescents

Multiple factors, including demographic, personal, and environmental factors, influence the eating behaviors of children and adolescents. Male adolescents report greater consumption of fruits and vegetables and higher daily intakes of calcium, dairy servings, and milk servings than females (78,92). Black adolescents are more likely than white or Hispanic adolescents to report eating fruits and vegetables five or more times per day (78). Children and adolescents from low-income households are less likely to eat whole grain foods (93).

Taste preferences of children and adolescents are a strong predictor of their food intake (94). Taste preference for milk, among both males and females, is associated with calcium

intake (92). Taste preferences for fruits and vegetables are one of the strongest reported correlates of fruit and vegetable intake among males and females (94). Male and female adolescents who reported frequent fast-food restaurant visits (three or more visits in the past week) were more likely to report that healthy foods tasted bad, that they did not have time to eat healthy foods, and that they cared little about healthy eating (95).

Certain behaviors and attitudes among children and adolescents are related to healthy eating. For example, behavior-change strategies that are initiated by children and adolescents (e.g., setting goals for fruit and vegetable intake or rewarding themselves for eating fruits and vegetables) and positive feelings toward eating fruits and vegetables are predictors of fruit and vegetable intake (95). Among female adolescents, self-efficacy to make healthy food choices and positive attitudes toward nutrition and health are significantly related to calcium intake (92).

The home environment and parental influence are strongly correlated with youth eating behaviors. Home availability of healthy foods is one of the strongest correlates of fruit, vegetable, and calcium and dairy intakes (92,94). Family meal patterns, healthy household eating rules, and healthy lifestyles of parents influence fruit, vegetable, calcium and dairy, and dietary fat intake of adolescents (94–97).

The physical food environment in the community, including the presence of fast-food restaurants, grocery stores, schools, and convenience stores, influences access to and availability of foods and beverages (98). A lack of grocery stores in neighborhoods is associated with reduced access to fresh fruits and vegetables (99,100) and less healthy food intake (101). Low-income neighborhoods have fewer grocery stores than middle-income neighborhoods, predominantly black neighborhoods have half the number of grocery stores as predominantly white neighborhoods, and predominantly Hispanic neighborhoods have one third the amount of grocery stores as predominantly non-Hispanic neighborhoods (102). Furthermore, lower-income and minority neighborhoods tend to have more fast-food restaurants than high-income and predominately white neighborhoods (101).

During 1994–1998, approximately three in 10 children and adolescents consumed at least one fast-food meal per day; those who reported eating fast foods consumed more total calories than those who did not (103). Children and adolescents who report eating fast foods tend to consume more total energy, fat, and sugar-sweetened beverages and consume less milk, fruits, and nonstarchy vegetables (103). Children and adolescents are more likely than adults to report fast-food consumption (104).

The school environment also influences youth eating behaviors and provides them with opportunities to consume an array of foods and beverages throughout the school day.

The widespread availability of foods and beverages served outside of the federal school lunch and breakfast programs is well-documented (105,106). These products, referred to as competitive foods and beverages because they are sold in competition with traditional school meals, often are sold in the school cafeteria and are available throughout school buildings, on school grounds, or at school-sponsored events. Results from a nationally representative survey found that in the 2004–2005 school year, one or more sources of competitive foods were available in 75% of elementary schools, 97% of middle schools, and 100% of high schools (106).

Food advertising and marketing influence food and beverage preferences and purchase requests of children and adolescents (i.e., when a child asks a parent to buy a specific item) and influence the dietary intake of children and adolescents (107). Children and adolescents are exposed to many forms of marketing, including television advertisements, advertising on the Internet and advergames (i.e., interactive, electronic games on a company-sponsored website that prominently feature one or more of the company's products or services), contests and prizes, television and movie product placement, marketing in schools (e.g., school score boards, vending machines, book covers, and homework incentives), and use of licensed characters to promote foods or restaurants. In a recent report to Congress, the Federal Trade Commission estimated that in 2006, approximately \$1.6 billion was spent promoting foods, beverages, and fast-food restaurants to children (108). Because of the concern regarding the effect of food marketing on the diets of children and adolescents, Congress ordered the creation of an Interagency Working Group on Food Marketing to Children in 2009 to develop recommendations for foods marketed to persons aged <18 years.

Physical Activity Recommendations

Physical activity is defined as “any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level” (9). Examples of physical activity include walking, running, bicycling, swimming, jumping rope, active games, resistance exercises, and household chores. In the 2008 *Physical Activity Guidelines for Americans*, the U.S. Department of Health and Human Services (HHS) recommends that children and adolescents engage in ≥ 60 minutes of physical activity daily. Most of the ≥ 60 minutes/day should be either moderate- or vigorous-intensity aerobic physical activity. The guidelines indicate that children and adolescents should include vigorous intensity, muscle-strengthening, and bone-strengthening activities at least 3 days of the week. HHS also recommends encouraging children and adolescents to participate in activities that are age

appropriate, are enjoyable, and offer variety (9). *Healthy People 2020* national health objectives include an objective on increasing the proportion of adolescents who meet current federal physical activity (PA) guidelines for aerobic physical activity and for muscle-strengthening activity (objective PA 3) (10).

Physical Activity Behaviors of Children and Adolescents

Despite national guidelines for physical activity, many young persons are not regularly physically active. In 2002, 62% of children and adolescents aged 9–13 years did not participate in any organized physical activity during nonschool hours, and 23% did not engage in any free-time physical activity (109). The 2009 national YRBS indicated that only 18% of high school students had been physically active for 60 minutes every day in the previous week (78). In 2009, although 56% of high school students reported being enrolled in physical education, only 33% of high school students nationwide attended physical education classes 5 days in an average school week, a decrease from 1991, when 43% of students attended physical education classes 5 days/week (78). Nationwide, 58% of high school students reported playing on at least one sports team run by their school or a community group in 2009 (78). As of 2005, <15% of children and adolescents walked or bicycled to and from school (110).

Factors that Influence the Physical Activity of Children and Adolescents

Regular participation in physical activity among children and adolescents is related to demographic, personal, social, and environmental factors. Hispanic and non-Hispanic black students are less active than their non-Hispanic white counterparts (78). In 2009, 20% of non-Hispanic white high school students, compared with 16% of Hispanic students and 17% of non-Hispanic black students, had been physically active for 60 minutes every day in the previous week (78). This difference also is evident during childhood and continues through adulthood, with non-Hispanic white adults having the highest prevalence of activity compared with other ethnic groups (111).

Sex is correlated with physical activity levels, with males participating in more overall physical activity than females (112–118). The 2009 national YRBS indicated that 25% of males and 11% of females had been physically active doing any kind of physical activity for at least 60 minutes per day in the previous week (78). This trend continues through adulthood, with females remaining less physically active than males (119). Adolescent males also report a greater intention to be physically active in the future than females (120).

Children and adolescents who intend to be active in the future and who believe physical activity is important for a

healthy lifestyle engage in more activity. Overall, personal fulfillment influences the motivation both of boys and girls to be physically active (121). Child and adolescent perceptions of their ability to perform a physical activity (i.e., self-efficacy) and perceived competence affects their participation in the activity (112,121–123). Girls are motivated by physical activities that they prefer and by their confidence in their ability to perform an activity (123). Boys are affected by their ability to perform a particular physical activity, as well as by social norms among both friends and parents (123).

Positive social norms and support from friends and family encourage youth involvement in physical activity among all children and adolescents (112,122,124–132). Parent and family support for physical activity can be defined as a child's perception of support (e.g., perceiving parents will do physical activity with them and sign them up for sports or other physical activities) to a parent's reported support (e.g., regular encouragement of physical activity or regularly placing value on being active). Youth perceptions and parent reports of support for physical activity are strongly associated with participation in both structured and nonstructured physical activity among children and adolescents (112,122,133–135).

The physical environment can be both a benefit and a barrier to being physically active. Environmental factors that might pose a barrier to physical activity include low availability of safe locations to be active, perceived lack of access to physical activity equipment, cost of physical activities, and time constraints (126,136–138). Youth perceptions of neighborhood safety (e.g., traffic, strangers, poorly maintained or unsafe facilities, poor lighting, or negative social influences) also are associated with physical activity participation (139–142). Parents' perceptions about environmental factors also influence physical activity among children and adolescents. For example, parents rate distance and safety as top barriers for their children walking to school (143).

The school environment can also influence the participation of children and adolescents in physical activity. In 2006, 4% of elementary schools, 8% of middle schools, and 2% of high schools provided daily physical education for the entire school year for students in all grades in the school (144). Although this is a critical opportunity for children and adolescents to participate in physical activity, schools do not provide it daily. In addition, many schools do not regularly provide other physical activity opportunities during the school day, such as recess. In 2006, 26% of elementary schools did not provide regularly scheduled recess for students in all grades in the school (144). When schools provide supportive environments by enhancing physical education (145,146) and health education (147), having staff members become role models for physical activity, increasing communication about the benefits of physical

activity, and engaging families and communities in physical activity, children and adolescents are more likely to be physically active and maintain a physically active lifestyle (147–149).

Television Viewing and Other Screen-Based Media Behaviors of Children and Adolescents

Television viewing, nonactive computer use, and nonactive video and DVD viewing are all considered sedentary behaviors. Television viewing among children and adolescents, in particular, has been shown to be associated with childhood and adult obesity (150–157). Potential mechanisms through which television viewing might lead to childhood obesity include 1) lower resting energy expenditure, 2) displacement of physical activity, 3) food advertising that influences greater energy intake, and 4) excess eating while viewing (158,159).

The American Academy of Pediatrics (AAP) recommends no more than 2 hours of quality television and video viewing (e.g., educational television programs) per day for children aged ≥ 2 years (160). Overall, persons aged 8–18 years spend an average of 7 hours and 11 minutes per day watching television, using a computer, and playing video games (161). In 2009, 33% of 9th- through 12th-grade students reported watching ≥ 3 hours of television on an average school day, and 25% reported using a computer ≥ 3 hours on an average school day (78). Black high school students most frequently reported excessive television viewing (≥ 3 hours/day) (56%), compared with their Hispanic (42%) and non-Hispanic white (25%) counterparts. Non-Hispanic black and Hispanic students also were more likely to report excessive computer use (≥ 3 hours/day) (30% and 26%, respectively) compared with non-Hispanic white students (22%) (78).

The home environment offers children and adolescents many opportunities for television viewing, including eating meals while watching television or having a television in their bedroom (162–165). The presence of a television in a child's bedroom is associated with more hours spent watching television (0.25 hours/day) (163), more time engaged in video games (0.31 hours/day), more time using computers (0.21 hours/day) (163), and obesity (162,164,166,167). The likelihood of having a television in the bedroom increases with a child's age (163,167).

Eating meals in front of the television is associated with more viewing hours (163). Children and adolescents are more likely to engage in unhealthy eating behaviors when watching television (155,168,169) and are exposed to television advertisements promoting primarily restaurants and unhealthy food products (151,170). Increased television viewing among children and adolescents is associated with consuming more products such as fast food, soft drinks, and high-fat snacks

(151,156,165,171–173) and consuming fewer fruits and vegetables (151,155,174).

Healthy People 2020 Objectives for Healthy Eating and Physical Activity Among Children and Adolescents

Healthy People 2020 national health objectives include a comprehensive plan for health promotion and disease prevention in the United States. *Healthy People 2020* includes objectives related to physical activity and healthy eating among children and adolescents and in schools (Appendix B) (10).

Rationale for School Health Programs to Promote Healthy Eating and Physical Activity

Healthy Eating, Physical Activity, and Academic Performance

As of 2009, >95% of children and adolescents aged 5–17 years were enrolled in schools (175). Schools have direct contact with students for approximately 6 hours each day and for up to 13 critical years of their social, psychological, physical, and intellectual development (176). The health of students is strongly linked to their academic success, and the academic success of students is strongly linked with their health. Therefore, helping students stay healthy is a fundamental part of the mission of schools (177–180). School health programs and policies might be one of the most efficient means to prevent or reduce risk behaviors, prevent serious health problems among students, and help close the educational achievement gap (181,182). Schools offer an ideal setting for delivering health promotion strategies that provide opportunities for students to learn about and practice healthy behaviors. Schools, across all regional, demographic, and income categories, share the responsibility with families and communities to provide students with healthy environments that foster regular opportunities for healthy eating and physical activity. Healthy eating and physical activity also play a significant role in students' academic performance.

The importance of healthy eating, including eating breakfast, for the overall health and well-being of school-aged children cannot be understated. Most research on healthy eating and academic performance has focused on the negative effects of hunger and food insufficiency (62) and the importance of eating breakfast (65,183,184). Recent reviews of breakfast and cognition in students (73,185,186) report that eating a healthy breakfast might enhance cognitive function (especially memory), increase attendance rates, reduce absenteeism, and

improve psychosocial function and mood. Certain improvements in academic performance such as improved math scores also were noted (65,183).

A growing body of research focuses on the association between school-based physical activity, including physical education, and academic performance among school-aged children and adolescents. A comprehensive CDC literature review that included 50 studies synthesized the scientific literature on the association between school-based physical activity, including physical education, and academic performance, including indicators of cognitive skills and attitudes, academic behaviors (e.g., concentration, attentiveness, and time on task), and academic achievement (e.g., grade point average and test scores). The review identified a total of 251 associations between school-based physical activity and academic performance. Of all the associations examined, 51% were positive, 48% were not significant, and 2% were negative. Therefore, the evidence suggests that 1) substantial evidence indicates that physical activity can help improve academic achievement, including grades and standardized test scores; 2) physical activity can affect cognitive skills and attitudes and academic behavior (including enhanced concentration, attention, and improved classroom behavior); and 3) increasing or maintaining time dedicated to physical education might help and does not appear to adversely affect academic performance (187).

Coordinated School Health Approach

Schools can promote the acquisition of lifelong healthy eating and physical activity behaviors through strategies that provide opportunities to practice and reinforce these behaviors. School efforts to promote healthy eating and physical activity should be part of a coordinated school health framework, which provides an integrated set of planned, sequential, and school-affiliated strategies, activities, and services designed to promote the optimal physical, emotional, social, and educational development of students. A coordinated school health framework involves families and is based on school and community needs, resources, and standards. The framework is coordinated by a multidisciplinary team such as a school health council and is accountable to the school and community for program quality and effectiveness (182).

School personnel, students, families, community organizations and agencies, and businesses can collaborate to successfully implement the coordinated school health approach and develop, implement, and evaluate healthy eating and physical activity efforts. Ideally, a coordinated school health framework integrates the efforts of eight components of the school environment that influence student health (i.e., comprehensive health education, physical education, and health services: mental health and social services, school nutrition services,

healthy and safe school environment, school employee wellness, and family and community involvement) (188). The following guidelines reflect the coordinated school health approach and include additional areas deemed to be important contributors to school health: policy development and implementation and professional development for program staff.

School Health Guidelines to Promote Healthy Eating and Physical Activity

This report includes nine general guidelines for school health programs to promote healthy eating and physical activity. Each guideline is followed by a series of strategies for implementing the general guidelines. Because each guideline is important to school health, there is no priority order. Guidelines presented first focus on the importance of a coordinated approach for nutrition and physical activity policies and practices within a health-promoting school environment. Then, guidelines pertaining to nutrition services and physical education are provided, followed by guidelines for health education, health, mental health and social services, family and community involvement, staff wellness, and professional development for staff.

Although the ultimate goal is to implement all guidelines recommended in this report, not every guideline and its corresponding strategies will be feasible for every school to implement. Because of resource limitations, some schools might need to implement the guidelines incrementally. Therefore, the recommendation is for schools to identify which guidelines are feasible to implement, based on the top health needs and priorities of the school and available resources. Families, school personnel, health-care providers, businesses, the media, religious organizations, community organizations that serve children and adolescents, and the students themselves also should be systematically involved in implementing the guidelines to optimize a coordinated approach to healthy eating and regular physical activity among school-aged children and adolescents.

The guidelines in this report are not clinical guidelines; compliance is neither mandatory nor tracked by CDC. However, CDC monitors the status of student health behaviors and school health policies and practices nationwide through three surveillance systems. These systems provide information about the degree to which students are participating in healthy behaviors and schools are developing and implementing the policies and practices recommended in the guidelines. The Youth Risk Behavior Surveillance System (YRBSS) monitors priority health-risk behaviors (e.g., unhealthy dietary behaviors and physical inactivity) and the prevalence of obesity and asthma among high school students. YRBSS includes a national,

school-based survey conducted by CDC and state, territorial, tribal, and district surveys conducted by state, territorial, and local education and health agencies and tribal governments. YRBSS data are used to 1) measure progress toward achieving national health objectives for *Healthy People 2020* and other program and policy indicators, 2) assess trends in priority health-risk behaviors among adolescents and young adults, and 3) evaluate the effect of broad school and community interventions at the national, state, and local levels. In addition, state, territorial, and local agencies and nongovernmental organizations use YRBSS data to set and track progress toward meeting school health and health promotion program goals, support modification of school health curricula or other programs, support new legislation and policies that promote health, and seek funding and other support for new initiatives. The CDC School Health Policies and Practices Study (SHPPS) is a national survey conducted periodically to assess school health policies and practices at the state, district, school, and classroom levels. SHPPS data are used to 1) identify the characteristics of each school health program component (e.g., physical education and activity and nutrition services) at the state, district, school, and classroom (where applicable) levels across elementary, middle, and high schools; 2) identify persons responsible for coordinating and delivering each school health program component and their qualifications and educational background; 3) identify collaborations that occur among staff members from each school health program component and with staff members from outside agencies and organizations; and 4) describe changes in key policies and practices over time. The School Health Profiles (i.e., Profiles) is a system of surveys assessing school health policies and practices in states, large urban school districts, territories, and tribal governments. State, local, and territorial education and health officials use Profiles data to 1) describe school health policies and practices and compare them across jurisdictions, 2) identify professional development needs, 3) plan and monitor programs, 4) support health-related policies and legislation, 5) seek funding, and 6) garner support for future surveys. Results from the surveys are described throughout this report.

Guideline 1. Use a Coordinated Approach to Develop, Implement, and Evaluate Healthy Eating and Physical Activity Policies and Practices

Physical education, health education, and other teachers; school nutrition service staff members; school counselors; school nurses and other health, mental health, and social services staff members; community health-care providers; school

administrators; student and parent groups; and community organizations should work together to maximize healthy eating and physical activity opportunities for students (Box 1). Coordination of all these persons and groups facilitates greater communication, minimizes duplication of policy and program initiatives, and increases the pooling of resources for healthy eating and physical activity policies and practices (189–192).

BOX 1. Strategies for guideline 1: Use a coordinated approach to develop, implement, and evaluate healthy eating and physical activity policies and practices

- Coordinate healthy eating and physical activity policies and practices through a school health council and school health coordinator.
- Assess healthy eating and physical activity policies and practices.
- Use a systematic approach to develop, implement, and monitor healthy eating and physical activity policies.
- Evaluate healthy eating and physical activity policies and practices.

Coordinate Healthy Eating and Physical Activity Policies and Practices Through a School Health Council and School Health Coordinator

Establish a school health council and designate a school health coordinator at the district level. Each district should have a school health council to help ensure that schools implement developmentally appropriate and evidence-based health policies and practices. Nationwide, in 2006, 73% of districts had one or more school health councils at the district level that offered guidance on the development of policies or coordinated activities on health topics (193). The school health council serves as a planning, advisory, and decision-making group for school health policies and programs. School health councils should include representatives from different segments of the school and community, including health and physical education teachers, nutrition service staff members, students, families, school administrators, school nurses and other health-care providers, social service professionals, and religious and civic leaders (193–195). The school health council provides input on decisions about how to promote health-enhancing behaviors, including healthy eating and physical activity among students. Some roles of school health councils include (194)

- needs assessment and resource mapping;
- program planning;
- advocacy;
- financial and resource planning;

- development of policies and practices, including those that address healthy eating and physical activity;
- assistance in reviewing and making recommendations about health-related curricula and instructional materials;
- communication of the importance of health and safety policies and activities to the superintendent, school board, schools, and community;
- coordination of school health programs and events within the school district and between schools and local community groups; and
- evaluation, accountability, and quality control of school health policies and programs.

Each district also should designate a school health coordinator who manages and coordinates health-related policies and practices across the district, including those related to healthy eating and physical activity. This person serves as an active member of the district-level school health council and communicates the district school health council's decisions and actions to school-level health coordinators and teams, staff, students, and parents (189,196–198). In 2006, 68% of districts had a person who oversaw or coordinated school health (e.g., a school health coordinator) (193). A district school health coordinator also should

- work closely with school-level health coordinators to ensure consistent implementation of health policies and practices across schools;
- coordinate professional development for school health staff members;
- secure funding and other resources to support school health and safety policies and activities;
- facilitate linkages between the district's health-related programs and services and health-related resources in the community; and
- coordinate evaluation of policies and practices.

Establish a school health team and designate a school health coordinator at the school level. Each school should establish a school health team, representative of school and community groups, to work with the greater school community to identify and address the health needs of students, school administrators, parents, and school staff. Nationwide, in 2006, 40% of schools had a school health council that offered guidance on the development of policies or coordinated activities on health topics (193). A school health team

- ensures that district-level policies and practices are implemented efficiently;
- communicates and coordinates with the district-level school health coordinator;
- assists with evaluating school health policies and practices;
- recommends new or revised health and safety policies and activities;

- assists in reviewing and making recommendations about health-related curricula and instructional materials;
- seeks funding or leverages resources to support school health and safety priorities; and
- communicates the importance of school health and safety policies and activities within the school, as well as to parents and the community.

Every school also should designate a school health coordinator to manage the school health policies, practices, activities, and resources, including those that address healthy eating and physical activity. In 2006, 61% of schools had someone at the school to oversee or coordinate school health (e.g., a school health coordinator) (193). School health coordinators might

- facilitate collaboration among school staff responsible for the health and safety of students;
- facilitate linkages between the school's health-related programs and services and health-related resources in the community (189,196,197);
- serve as a liaison between the school and those who oversee school health and safety programs at the district level and in other schools;
- communicate school health and safety priorities to the principal, staff, parents, community organizations, and students;
- help secure funding or other resources to support school building health and safety activities;
- manage school health funds;
- assist in the development of school health and safety policy materials and in the selection of educational materials;
- organize and conduct school health team meetings;
- facilitate the provision of professional development activities for school health staff; and
- assist with the assessment of student health needs and evaluation of school health policies and activities.

Assess Healthy Eating and Physical Activity Policies and Practices

An assessment of current school-based healthy eating and physical activity policies and practices is necessary to provide baseline information about strengths and weaknesses. An assessment can also identify how district-level policies are being implemented at the school level and in the development of community-specific strategies. An assessment enables the school health council, school health coordinator, parents, school administrators, and school board members to develop a data-based plan for improving student health. The CDC School Health Index: A Self-Assessment and Planning Guide (available at <http://www.cdc.gov/healthyyouth/shi>), a tool based on scientific evidence and best practices in school health, helps schools identify strengths and weaknesses of school

policies and practices related to nutrition, physical activity, and other important health topics. Schools and school districts can refer to the School Health Index for a comprehensive list of policies and practices that promote healthy eating and physical activity in schools. The School Health Index guides schools through the development of an action plan to improve their school health policies and practices (199,200). Results from the School Health Index assessment and action plan can help schools determine where, what, and how to incorporate health promotion programs and policies into their overall school improvement plan. Inclusion in the school improvement plan helps ensure that health is a regular item on agendas of district school board meetings and school-based management committees.

Completing the School Health Index can lead to positive changes in the school health environment. For example, after completing the School Health Index, some schools have hired a physical education teacher for the first time, added healthier food choices to school meal programs, and incorporated structured fitness breaks into the school day (201–203). An assessment might also involve collection of data on current eating and physical activity behaviors of students, community-based nutrition and physical activity programs, and student, staff, and parent needs (189).

Use a Systematic Approach To Develop, Implement, and Monitor Healthy Eating and Physical Activity Policies

School health policies are official statements from education agencies and other governing bodies (e.g., state legislatures) at the state, district, or school level. They identify what should be done, why it should be done, and who is responsible for doing it. School health policies can (204)

- provide evidence of leadership, commitment, and support for school health, including healthy eating and physical activity, from school boards, school administrators, and other decision makers;
- drive positive changes in healthy eating and physical activity programs;
- sustain and expand healthy eating and physical activity programs or activities;
- establish accountability by identifying who is responsible for healthy eating and physical activity programs and policies; and
- establish performance measures.

School health policies should comply with federal, state, and local laws and mandates. School health councils, teams, and coordinators can lead the development, implementation, and monitoring of policies (194,196).

The Child Nutrition and WIC Reauthorization Act of 2004 required that each school district participating in the federally supported meal program establish a local school wellness policy for the first time by school year 2006 (205). By 2007–2008, most school districts had a local wellness policy; however, the quality of policies varied across school districts. In addition, many of the policies lacked plans for implementing and monitoring the status of the wellness policy (206).

The Healthy, Hunger-Free Kids Act of 2010 (207) updated requirements for local school wellness policy to include, at a minimum,

- goals for nutrition promotion and education, physical activity, and other school-based activities that promote student wellness;
- nutrition guidelines for all foods available on each school campus under the jurisdiction of the local educational agency during the school day that are consistent with requirements in the act and that promote student health and reduce childhood obesity;
- a requirement that the local education agency permit parents, students, representatives of the school food authority, teachers of physical education, school health professionals, the school board, school administrators, and the general public to participate in the development, implementation, and periodic review and update of the local school wellness policy;
- a requirement that the local education agency inform and update the public on local school wellness policy content and implementation;
- a requirement that the local education agency periodically measure and make available to the public an assessment on the implementation of the local school wellness policy, including the level of school implementation, how the local school wellness policy compares with model policy, and a description of progress made toward goals; and
- a requirement that the local education agency designate one or more local education agency officials or school officials to ensure that each school complies with the local school wellness policy.

The act also requires that the U.S. Department of Agriculture (USDA), in conjunction with the CDC director, “prepare a report on the implementation, strength, and effectiveness of the local school wellness policies” (207).

States, districts, and schools should use a systematic approach when developing, implementing, and monitoring healthy eating and physical activity policies. They can use the following strategies throughout the policy process.

Identify and involve key stakeholders from the beginning of the policy process. One person, such as the school health coordinator (at the district or school level, depending on the

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