



Physical Activity and Cancer Prevention: Best Practices in Physical Education and Physical Activity

Mary Puckett, PhD

Health Scientist

Division of Cancer Prevention and Control

Centers for Disease Control and Prevention

Physical Activity and Cancer Prevention: What we know

Use for section headers

Physical Activity Reduces Risk of Some Cancers



- Strong evidence suggests that physical activity reduces the risk of breast cancer and colon cancer
- Obesity has been linked to an increased risk of several cancers and physical activity reduces the risk of overweight and obesity.
 - Endometrial cancer
 - Esophageal adenocarcinoma
 - gastric cardia cancer
 - Liver Cancer
 - Kidney Cancer
 - Multiple myeloma
 - Meningioma
 - Pancreatic Cancer
 - Colorectal Cancer
 - Gallbladder Cancer
 - Post-menopausal breast cancer
 - Ovarian cancer
 - Thyroid cancer

Breast Cancer

- Each year in the US, over 230,000 cases of female breast cancer are diagnosed
- Physical activity is associated with a median 20% reduction in the risk of breast cancer
- Physical activity reduces the risk of both premenopausal and postmenopausal breast cancer
- Physical activity reduces risk in women with and without a family history of breast cancer
- Vigorous physical activity provides the largest reduction in breast cancer risk, but even moderate-intensity activity, such as brisk walking, provides a benefit



Colon Cancer

- Almost 97,000 cases of colon cancer are diagnosed in the US each year
- Physical activity is associated with a median 30% reduction in the risk of colon cancer
- Physical activity is associated with a lower risk of developing colon polyps
- Vigorous physical activity has been associated with the greatest reduction in risk but lower levels of physical activity have also shown some risk reduction as well



Physical Activity and Obesity Reduction

- Obesity is associated with increased risk of multiple cancers
- Higher levels of obesity have been associated with lower levels of physical activity in both children and adults
- Increasing physical activity has been shown to decrease obesity, particularly in children
- Physical activity and obesity reduction are associated with a variety of positive health outcomes
 - Reduced cancer risk
 - Reduced cardiovascular disease
 - Increased mobility

Physical Activity Guidelines



■ Key Guidelines for Adults

- Avoid inactivity
- At least 150 minutes a week of moderate-intensity or 75 minutes a week of vigorous-intensity aerobic activity
- For additional health benefits, increase aerobic activity to 2x base recommendation
- Muscle-strengthening activities twice a week

Physical Activity Guidelines

- **Key Guidelines for Children and Adolescents**
- 60 minutes or more of physical activity daily
 - Aerobic
 - Muscle-strengthening
 - Bone-strengthening
- Activities should be:
 - Age appropriate
 - Enjoyable
 - Offer variety



Prevalence of Meeting Physical Activity Guidelines

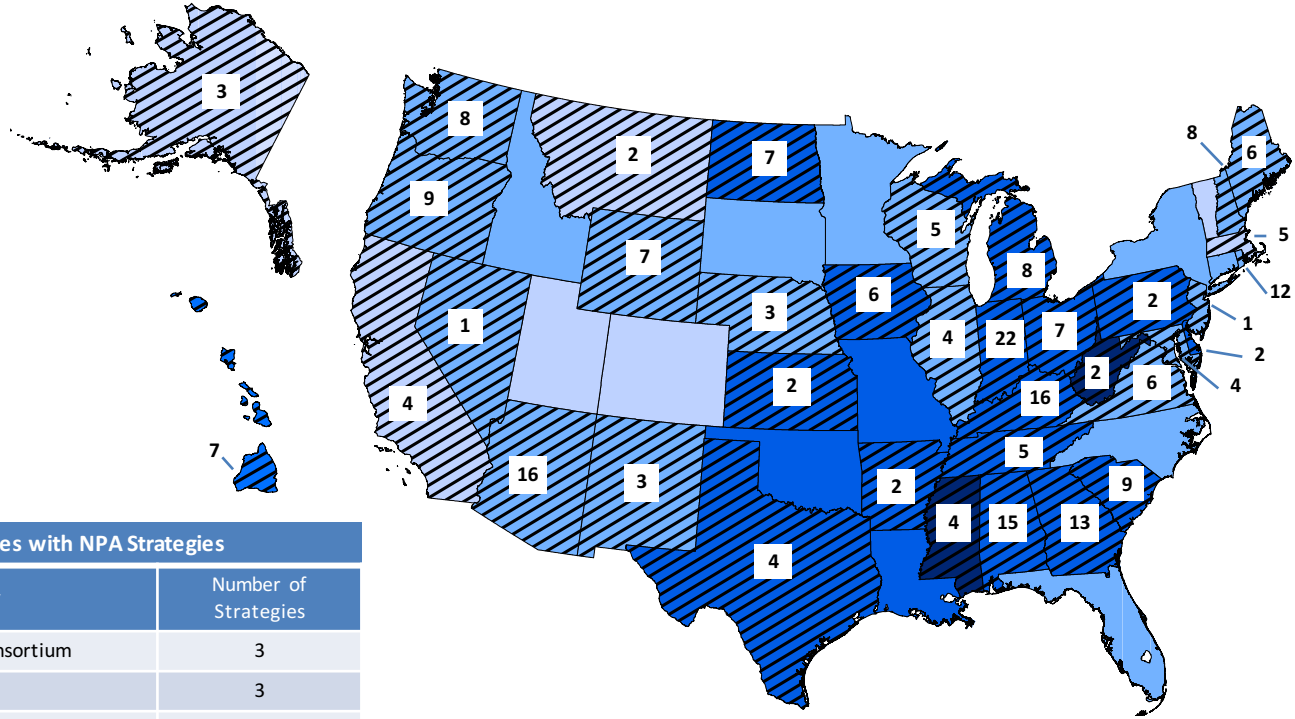
- Many children are not physically active on a regular basis
- From a 2011 survey of high school students:
 - 29% participated in at least 60 minutes of physical activity on all 7 days before the survey
 - 31% attended physical education class daily
 - 58% reported playing on at least one sports team
- In 2011, only 20.6% of adults met physical activity recommendations.
 - 17.9% of women
 - 15.6% of adults \geq 65 years of age

What are National Comprehensive Cancer Control Program grantees currently doing?

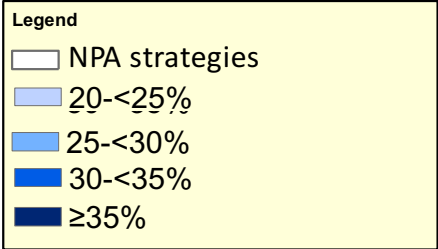
Nutrition and Physical Activity (NPA) in Cancer Plans

- Rationale:
 - NPA is important for cancer prevention and survivorship
 - No previous cancer plan reviews on this topic
- Methods:
 - All cancer plans from 2004-2014 were reviewed for NPA related terms
 - Plans were categorized:
 - Knowledge of the NPA and cancer link
 - Goals to improve NPA behaviors
 - Strategies to increase healthy NPA activities, environments, or systems changes
 - Strategies were classified into specific categories

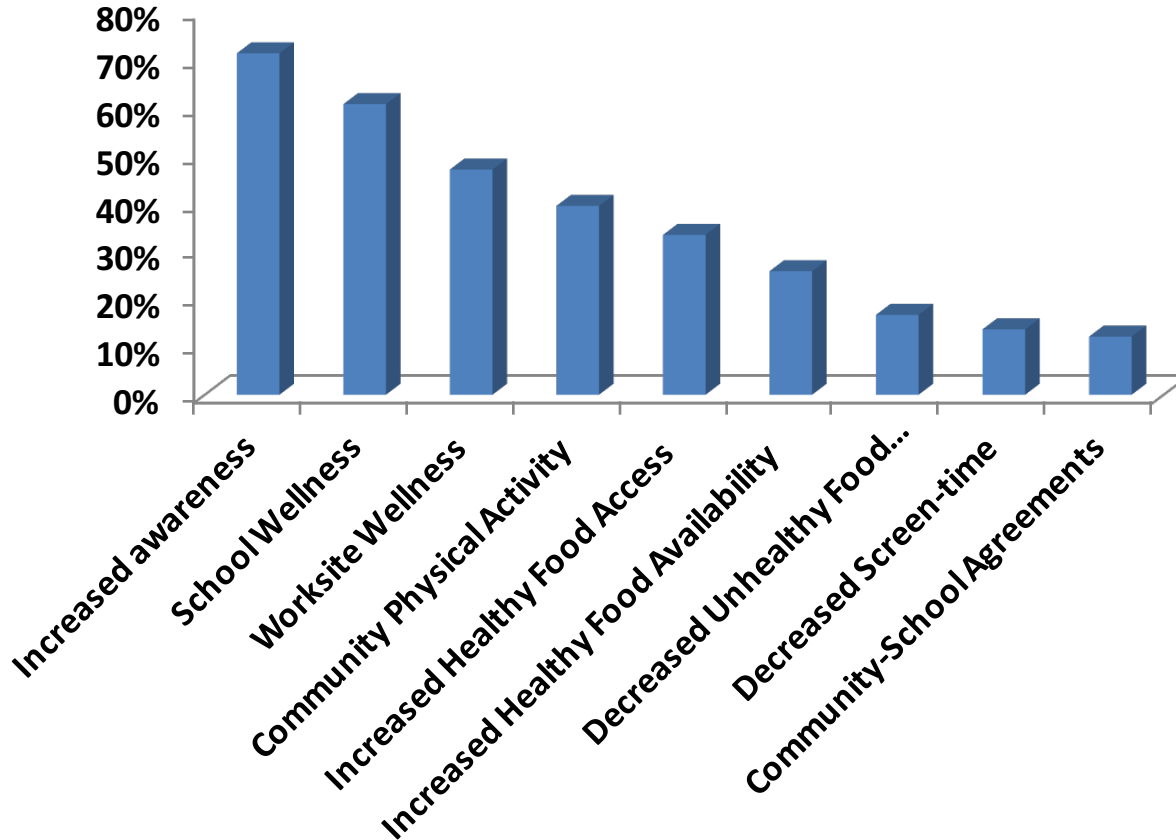
NPA strategies and Nutrition, Physical Activity, and Obesity Data by Region.



Tribes/Territories with NPA Strategies	
Tribe/Territory	Number of Strategies
Alaska Native Tribal Health Consortium	3
Cherokee Nation	3
Commonwealth of the Northern Marianna Islands	3
Fond du Lac	1
Guam	1
Northwest Portland Area Indian Health Board	3
Puerto Rico	6
Republic of Palau	1
Republic of the Marshall Islands	7
Tohono O'odom Nation	4



Strategies Present in Cancer Plans



Examples of Selected Strategies in Cancer Plans

Strategy	Example
Increased awareness	Increase public awareness of the benefits of physical activity through media campaign.
Community Physical Activity	Promote building of safe sidewalks and bike paths between community schools and residential areas.
School Wellness	Promote increased time requirement for physical activity during physical education classes in school.
Worksite Wellness	Engage companies to implement evidence based worksite programs to promote physical activity
Increased Healthy Food Access (Farmer's Markets, Gardens, etc.)	Promote policies...that provide opportunities for good nutrition in underserved communities (i.e. farmers' markets, community gardens).
Increased Healthy Food Availability	Promote an increase in schools that support healthy foods on campus by offering fruits or non-fried vegetables in vending machines and school stores, canteens, or snack bars, and during celebrations when foods and beverages are offered.
Decreased Less Healthy Food Availability	Educate and advocate for the removal of soda vending machines from schools and replacing with water and 100% juice products.
Community-School Agreements	Increase the proportion of schools that provide access to their physical activity ...outside of normal school hours.
Decreased Screen-time	Collaborate...to encourage children to decrease time spent with video games and TV and to substitute physical activity.

PROMISING PRACTICES FOR CANCER
PREVENTION AND SURVIVORSHIP:
PHYSICAL ACTIVITY

Promising Practices for Physical Activity



Strong evidence suggests that physical activity reduces the risk of several cancers, including breast and colon cancers.^{1,2} Worldwide, around 10% of breast and colon cancer cases are linked to a lack of activity.³ Being physically active also helps prevent overweight or obesity, which may reduce a person's risk of certain cancers related to excess body weight.

Barriers to Physical Activity

- Lack of time
- Safety issues
- Boring or not enjoyable
- Lack of confidence in ability to be physically active
- Lack encouragement, support, or companionship
- Built environment limitations
- Physical disabilities

Strategies That Work for Increasing Physical Activity

■ Individually Adapted Health Behavior Change Programs

- Goal-setting and self-monitoring of progress toward those goals.
- Building social support for new behaviors.
- Behavioral reinforcement through self-reward and positive self-talk.
- Structured problem-solving to maintain the behavior change.
- Prevention of relapse into sedentary behavior.

■ Social Support Interventions in Community Settings

- Building, strengthening, and maintaining social networks in order to provide supportive relationships for behavior change

■ Community-Wide Campaigns

- Highly visible, broad-based, multicomponent strategies that involve many sectors of the community

Strategies That Work for Increasing Physical Activity

■ Enhanced School-Based Physical Education

- Changes that increase the amount of time that students in kindergarten through 12th grade engage in moderate- or vigorous-intensity physical activity during PE classes.
 - Instructional strategies and lessons that increase physical activity, such as modifying the rules of games or substituting more active games for less active ones.
 - Physical education lesson plans that incorporate fitness and circuit training activities.

■ Community-Scale Urban Design and Land Use Policies

- Proximity of residential areas to stores, jobs, schools, and recreation areas
 - Connectivity of streets and sidewalks
 - Aesthetic and safety aspects of the physical environment
- ## ■ Prompts to Encourage Stair Use
- Motivational signs placed in or near stairwells, elevators and escalators to encourage people to use stairs more often

Strategies That Work for Increasing Physical Activity

■ Street-Scale Urban Design and Land Use Policies

- Improve street lighting
- Increase safety of street crossing
- Traffic-calming approaches (such as speed humps and traffic circles)
- Building codes
- Roadway design standards

■ Creation of or Enhanced Access to Places for Physical Activity

- Creating walking trails
- Building exercise facilities
- Providing access to existing nearby facilities

■ Transportation and Travel Policies and Practices

- Pedestrian and bicycle networks
- Public transit systems

Strategies That Work for Increasing Physical Activity

■ **Clinical Strategies**

- Health care professionals have a role to play in counseling their patients about physical activity.
- Professional organizations encourage counseling as part of routine care for patients.
- USPSTF recommends physical activity counseling for anyone aged 6 or older with obesity.

Best Practices: Enhanced Physical Education

Enhanced School-based Physical Education

- Designed to increase the amount of time that K-12 students engage in moderate-or vigorous- intensity physical activity during physical education classes.
- Well Designed PE curriculum
- Providing staff with appropriate training
- Can be combined with other school- and community-based interventions
 - Student health education about physical activity
 - Activities that foster family involvement
 - Community partnerships to increase opportunities for physical activity

Components of Quality Physical Education

Opportunity to Learn

- All students are required to take physical education.
- Instructional periods totaling 150 minutes per week (elementary school) and 225 minutes per week (middle and secondary school).
- Physical education class size is consistent with that of other subject areas.
- Qualified physical education teacher provides a developmentally appropriate program.
- Adequate equipment and facilities.

Appropriate Instruction

- Full inclusion of all students.
- Maximum practice opportunities for class activities.
- Students are physically active for at least 50% of instructional time.
- Well-designed lessons that facilitate student learning.
- Out of school assignments that support learning and practice.
- Physical activity not assigned as or withheld as punishment.
- Regular assessment to monitor and reinforce student learning.

Components of Quality Physical Education

Meaningful Content

- Written, sequential curriculum for grades PK–12, based on state and/or national standards for physical education.
- Instruction in a variety of motor skills designed to enhance the physical, mental, and social/emotional development of every child.
- Fitness education and assessment to help children understand, improve and/or maintain physical well-being.
- Development of cognitive concepts about motor skills, physical activity, and fitness.
- Opportunities to improve emerging social and cooperative skills and gain a multicultural perspective.
- Promotion of regular amounts of appropriate physical activity now and throughout life.

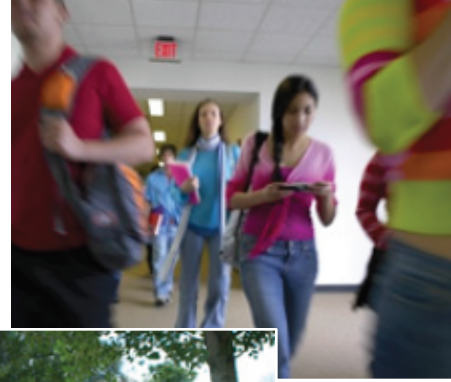
Student and Program Assessment

- Assessment is an ongoing, vital part of the physical education program.
- Formative and summative assessment of student progress.
- Student assessments are aligned with state/national physical education standards and the written physical education curriculum.
- Assessment of program elements that support quality physical education.
- Stakeholders periodically evaluate the total physical education program effectiveness.



Physical Activity before and after School

- Provides opportunities to:
 - Practice what they have learned in physical education
 - Work toward the recommended 60 minutes of daily physical activity
 - Become more adequately prepared for learning
 - Engage in safe, social, and supervised activities
 - Identify activities they enjoy and might engage in long term



Physical Activity before and after School

- Examples:
 - Walking/biking to school program
 - Physical activity clubs
 - Informal recreation or play on school grounds
 - Physical activity in school-based child care programs
 - Interscholastic sports



Additional Opportunities

- Recess
 - Provide age-appropriate equipment for students
 - Have adult recess supervisors encourage students to be physically active
 - Provide semi-structured activity that involves activity stations



Additional Opportunities

- Breaks in the classroom:
 - Take a 5-minute stretch break
 - March in place
 - Jump with an invisible jump rope
 - Take 2–3 laps around or throughout the classroom
 - Integrate physical activity into classroom lessons
- Breaks outside the classroom:
 - Incorporate daily school-wide physical activity during morning announcements
 - Take physical activity breaks between class changes
 - Form lunchtime club or intramural programs



Summary

- Physical activity reduces cancer risk
- Adults are the most at-risk population for cancer
 - Increasing physical activity in children and adolescents can promote a lifetime of physical activity and decreased adult obesity
- Many NCCCP grantees are already engaging in activities to increase physical activity
 - Promoting physical activity for cancer prevention is a priority
 - CDC has resources for increasing physical activity in community and school settings

Resources

- NCCCP Library of Indicators and Data Sources
<https://www.cdc.gov/cancer/dcpc/pdf/dp17-1701-ncccp-lids-primary-prevention.pdf>
- Promising Practices
https://www.cdc.gov/cancer/dcpc/prevention/policies_practices/physical_activity/index.htm
- CDC Healthy School Guide
https://www.cdc.gov/healthyschools/physicalactivity/pdf/13_242620-a_cspap_schoolphysactivityprograms_final_508_12192013.pdf
- The Community Guide
<https://www.thecommunityguide.org/>

Thank you!
MPuckett1@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

