

THE IMPORTANCE OF PHYSICAL ACTIVITY FOR CHILDREN AND ADOLESCENTS



MICHIGAN FITNESS FOUNDATION

**Michigan Governor's Council on
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The Michigan Governor's Council on Physical Fitness, Health and Sports issued its first position paper on *The Importance of Physical Activity for Children and Youth* in 1995. Since that time physical activity trends in youth have decreased, school physical education has declined, and obesity has increased dramatically. This paper updates the position of the Governor's Council on *The Importance of Physical Activity for Children and Youth*.

Position Paper: *The Importance of Physical Activity for Children and Adolescents*
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Position Paper: The Importance of Physical Activity for Children and Youth

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POSITION STATEMENT AND RECOMMENDATIONS

The Michigan Governor's Council on Physical Fitness, Health and Sports believes regular physical activity to be an integral component of the health of each child and adolescent in Michigan. Positive exercise habits formed in childhood can carry over into adulthood and help reduce morbidity and mortality from Type II diabetes, cardiovascular disease (CVD) and other chronic ailments. Toward this end, we recommend the following:

Exercise (Physical Activity) Recommendations

- All Michigan children should engage in physical activities that promote cardiorespiratory fitness and musculoskeletal fitness (including strength and flexibility).
- Children and adolescents should be permitted and encouraged to participate in enjoyable physical activities that total at least 60 minutes per day, on most days. Most of these activities should be of moderate intensity so that heart rate and breathing rate are increased.
- Children should engage in more vigorous activity on at least three days per week, where heart rate and breathing rate are increased even more.
- Children should have the opportunity and be encouraged to participate in traditional sports and games.
- In addition to organized sports, children should have the opportunity and be encouraged to participate in leisure activities such as walking, jogging, swimming, cycling, and skating.

Recommendations for Families

- Parents should serve as role models for physical activity, incorporating regular physical activity into the lives of all family members.
- Families should find physical activities that can be enjoyed together while de-emphasizing sedentary behaviors such as watching television.
- Parents should monitor their children's "screen time"—time spent watching television and on the computer. If children are averaging more than two

hours in "screen time" per day, parents should intervene.

- Family members should support one another's efforts in exercise and sports activities.

Policy Recommendations for Schools

- Schools should adopt and implement the *Exemplary Physical Education Curriculum (EPEC)*.
- All Michigan school children should have quality physical education every day.
- At the elementary grade levels, emphasis in physical education should be placed on student learning of fundamental motor skills, activity-related knowledge, personal/social skills and physical fitness. At the secondary grade levels, emphasis should be placed on personal responsibility for achieving adequate fitness and mastering lifetime activities such as swimming, and playing racquet sports.
- Physical education programs should have a well-defined curriculum based on content standards and benchmarks. Instructional materials used by teachers should be based on sound instructional design principles and should include assessments of student learning on all objectives.[¶]
- Teachers should be properly trained to deliver instruction and perform assessment based on the objectives in the curriculum.[¶]
- Physical education teachers should be certified in physical education.
- School physical fitness testing should emphasize health-related items, with reasonable and scientifically-based standards for determining minimum fitness that students should strive to attain. Testing should also be performed on motor skills, physical activity-based knowledge and physical activity-based personal/social skills. Award structures should emphasize individual improvement and promote lifelong physical activity behaviors. Results from testing should be used to help students set personal goals and improve their self-efficacy for physical activity, not to label students as unfit.

[¶]Schools that implement the Exemplary Physical Education Curriculum will meet this recommendation.

[†]This requirement is also met by completing levels 3 and 4 of the Governor's Council's Exemplary Physical Education Awards Program.

- Teachers and school administrators involved with health-related fitness should keep current with recent research findings so they may design appropriate programs and communicate effectively with their students.
- Schools should build opportunities for physical activity into the school day, including recess, lunchtime activity, and physical activity during transitions between academic lessons.
- Children who live one mile or closer to school should be encouraged to walk to school where it is safe for them to do so. Children who live within two miles of school should be encouraged to bike to school where it is safe for them to do so. If unsafe conditions are found, steps should be taken to correct them.
- School recreation and exercise facilities should be open for use by community members during non-school hours to promote opportunities for children and families to be physically active.

Policy Recommendations for Health Professionals

- Health and medical professionals should include recommendations on the importance of physical activity at all routine health care visits.

Policy Recommendations for Communities

- Community and school leaders should work together to provide facilities and physical environments that are safe and conveniently located for participants, including well-maintained sidewalks, crosswalks, bicycle paths, trails, parks, and recreation facilities.
- Communities should implement zoning and other policies that promote physical activity, such as mixed-use development and a connected grid of streets.
- Michigan communities should assess the extent to which they encourage residents to be physically active by completing the Community Self Assessment Inventory that is part of the application for the Promoting Active Communities Award of the Governor's Council on Physical Fitness, Health and Sports.

BACKGROUND AND SCIENTIFIC BASIS FOR THE RECOMMENDATIONS

Introduction

Inadequate physical activity in Michigan citizens of all ages is a serious public health problem. Regular activity sustained over several years contributes to weight control and protection from cardiovascular disease, diabetes, and other chronic diseases.^{5,113} In addition, recent investigations have shown that aerobic fitness and physical activity exert protective effects on heart disease risk in adults that are independent from other risk factors.^{9,10,34,76}

Despite the proven benefits of physical activity on health, data clearly show that the citizens of Michigan are not reaping the benefits of physical activity. In the state of Michigan, mortality from heart disease is higher than the national average and is the leading cause of death. The most recent Michigan health statistics indicate that heart disease was responsible for 31% of deaths.⁶¹ Michigan's rate of 287.5 heart disease deaths per 100,000 citizens in 2000 was approximately 12% higher than the national rate.⁶¹

Physical Activity in Michigan Adults

The Michigan heart disease death rate is not surprising in light of the state's profile for CVD risk factors.⁵⁹ Approximately 23% of adult Michigan residents reported **no** leisure time physical activity in 2000, and 75% indicated that they did not meet the minimum recommendation for health (30 minutes per day, five days per week). Coupled with this lack of physical activity, an estimated 62% of Michigan adults were overweight or obese[‡] in 2000. This ranks Michigan as second highest in prevalence of obesity in the United States. The prevalence of overweight or obesity in Michigan has risen by 14% in the past 10 years.⁶⁰

Physical Activity in Michigan Children

The most complete information available regarding physical activity habits of young people comes from the Youth Risk Behavior Surveillance (YRBS) system.²⁹ The Centers for Disease Control and Prevention (CDC) have used this system to track six youth behavior categories (including physical activity) since 1989. Preliminary results from the 2001 YRBS survey⁶⁵ indicate that 85% of Michigan adolescents surveyed reported they performed some vigorous activity at least one day a week for 20 minutes, but only 27% indicated five or more days of moderate activity. Boys were more likely than girls to report five days of moderate activity (30% vs. 24%). Physical activity levels reported by Michigan students were similar to national averages.

The shortage of physical activity among Michigan high school students is compounded by an excess of sedentary behavior. A disturbing 53.5% of the students surveyed reported watching two or more hours of television on a typical school night. Of those, 15.5% watched four or more hours. Michigan children are probably no different from other American children in their television viewing habits.⁶⁵

Physical education class is where students should be learning the necessary knowledge and skills to be physically active, yet physical education is not available to students as fully as it should be. According to data published in 2001 by the Michigan State Board of Education,⁶⁶ the majority of Michigan elementary schools offer physical education classes for an average of two days per week, for an average of 60 minutes per week. Half of middle school students receive physical education five days per week, for an average of 48 minutes per week for

[‡]Overweight for adults is defined as a body mass index of 25 to 29.9; obese is defined as a body mass index of 30 or above.

more than 25 weeks during the school year. Unfortunately, the other half receives far less than that. Only 29% of Michigan high school students reported having daily physical education classes.⁶⁵ Physical education in Michigan parallels the striking national trend for reduced participation. Nationally, 29% of adolescents in grades 9-12 participated in daily physical education in 1999, compared with 42% in 1991.¹⁴

Participation in organized sports provides another opportunity for physical activity. In Michigan, 61% of 9-12 graders reported playing on one or more sports teams. African American and Hispanic high school students were less likely (48%) than Caucasians (52%) to play on sports teams.⁶⁵

While it is encouraging that most youth perform some vigorous activities, there are still many who do not participate in any regular physical activity. Reasons include physical education classes not being available, limited spots on school-sponsored teams, and lack of resources for communities to provide recreational teams. In contrast, many children simply may choose not to participate, even if the opportunities are available. Reasons may range from lack of physical and/or motor skill development to being busy with other non-physical activities. Whatever the causes, it is important to initiate efforts to get non-participants involved in some form of physical activity before they become sedentary on a permanent basis.

Recent studies indicate a total of 30 minutes of moderate physical activity performed most days of the week has a significant impact on prevention of cardiovascular and other chronic diseases.^{80,113} These numbers should be attainable by the majority of Michigan children and youth if they are given the proper instruction, encouragement, and motivation.

History of the Issue

Health care professionals have long understood the importance of physical activity in children. Exercise has been prescribed traditionally as part of the treatment for children suffering from chronic diseases such as asthma, cystic fibrosis, and insulin-dependent diabetes.^{42,74,75,93} In many cases, regular physical activity may reduce both morbidity and mortality among these youngsters.⁹³

In the United States, studies of healthy children's exercise habits and physical fitness initially focused on judging muscular strength, speed, and power. In the 1950s, interest boomed when researchers found American children to be less fit, as measured by these tests, than European children.⁴⁹ These results shocked many Americans and prompted the formation of the President's Council on Youth Fitness in 1956, which later became the President's Council on Physical Fitness and Sports under President Kennedy. Soon afterward, the American Association for Health, Physical Education and Recreation developed a youth fitness test battery designed primarily

to measure general motor performance skills such as power, speed, and agility.⁴ More recently, youth fitness testing has evolved into a more health-related format, supplanting the emphasis on traditional motor skills.^{3,40} For example, test items now often include a distance walk/run to estimate aerobic fitness and measurement of body mass index (BMI) to screen for overweight. In addition, criterion scores have been set, based on current research findings, so students can be more appropriately judged in terms of overall health, rather than simply compared to each other.

At the present time, there is not total agreement on minimal criterion fitness standards, or even whether physical fitness has significantly declined in recent years in the majority of our youth.^{8,21,52,111} However, there is a consensus that children and adolescents should be involved in physical activity on a regular basis, and teaching/reward systems should encourage active participation and enjoyment by all students.^{55,96}

In recognition of the importance of physical activity as a preventive measure for chronic disease, the Michigan Association for Health, Physical Education, Recreation and Dance (MAHPERD) issued a position statement in 1989 emphasizing the importance of quality physical education programs in Michigan schools during the 1990s.⁵⁸ This was closely followed by the initiation of the *Exemplary Physical Education Curriculum (EPEC)*, a statewide project initiated by the Michigan Department of Community Health and the Governor's Council on Physical Fitness, Health and Sports.⁶³

EPEC was designed to be a public health initiative that addressed the crushing burden of chronic disease attributable to physical inactivity that would be carried out completely in the school setting. It has scientific grounding in chronic disease prevention, and uses state-of-the-art educational theory. The **EPEC** curriculum equips students to understand the importance of physical activity and to obtain the fitness, knowledge, motor skills and personal/social skills they need to be active for life.

EPEC instructional materials were first released in February of 1998. Since that time they have been voluntarily purchased by teachers in over 60% of Michigan school districts and teachers in 22 other states.⁶³ The **EPEC** elementary program is complete with ongoing development for the secondary levels.

In the 1990s, the Center for Disease Control and Prevention (CDC) assumed leadership in a new approach to increasing physical activity among children and adults. It was recognized that education about the importance of physical activity would not be effective if the physical and social environments made it inconvenient or unsafe to exercise. In 1995, an overview of this new approach was published⁹⁹ describing a new role for states—promoting policy and environmental interventions to prevent and control cardiovascular disease—along with specific

recommendations for environmental approaches to increasing physical activity.⁴⁶ Novel interventions that had not previously been considered the domain of public health were suggested, such as enactment of mixed land use zoning policies to encourage the development of neighborhood facilities that could be accessed by bicycle and foot.

Subsequent to this first report, the CDC and other national groups have published guidance and tools for enacting policies that make it easier for children and adults to be active. For example, in 1999, the CDC released *Kids Walk-To-School, A Guide to Community Action to Promote Children Walking to School*.¹⁶ The guide explains how communities can work cooperatively to systematically remove environmental barriers to children safely walking and biking to school.

One of the most widely applied policy and environment tools to promote physical activity in school children has been the *School Health Index* (SHI), published by the CDC in 2000.¹⁹ The SHI is a tool to help schools evaluate their policies that could affect physical activity.

The policy and environmental approach toward supporting youth physical activity was supported again by the Federal government in the fall of 2000 when the Secretary of Health and Human Services and the Secretary of Education issued *Promoting Better Health for Young People Through Physical Activity and Sports*.¹¹⁴ This report included an appeal to American communities to rethink their zoning and other civic policies. The report called for a community structural environment that makes it easy and safe for young people to walk, ride bicycles, and use close-to-home physical activity facilities. In February of 2001, representatives of CDC published an overview of policy and environmental recommendations to increase physical activity.⁴⁵

In response to recommendations from the CDC that state health departments devote attention to local and state policies related to physical activity, the Michigan Department of Community Health and the Governor's Council on Physical Fitness, Health and Sports collaborated to develop a self-assessment tool that could help local communities assess the extent to which they were making it easy for residents to be active. Since 2000, communities in Michigan have been able to conduct this self-assessment as part of an application for the Promoting Active Communities award. The award recognized five levels of achievement, allowing communities to be acknowledged for making improvements over time in policies and facilities.⁶⁴

In Michigan, the importance of each community's environment including easily accessible recreational facilities and opportunities for youth has long been recognized. In 1995, the Skillman Foundation published the results of a study of recreational opportunities for youngsters in the metro Detroit area.¹⁰⁶ The data showed that many neighborhood facilities are not adequate to

meet the recreational needs of youth, and that few children and adolescents participate in programs. Recommendations in the Skillman report were reiterated in policy and environmental recommendations. Recommendations included developing more and diverse recreational programs, upgrading facilities, and coordinating efforts between families and community leaders.

In 2001, the State of Michigan extended the policy and environmental approach to the area of preventing childhood obesity. A consensus paper titled *The Role of Michigan Schools in Promoting Healthy Weight*⁶² was released by the Michigan Department of Education, after a lengthy consensus process led by the Department of Education, the Department of Community Health and the Governor's Council on Physical Fitness, Health and Sports.

Scientific Basis

Recent studies have clearly shown that risk factors for CVD and other chronic diseases are evident in childhood.^{32,54,68,97,110} Many have been found to be related to children's aerobic fitness and physical activity, or lack thereof.^{22,89,101,105,107}

Physical inactivity has been shown to be a significant predictor and cause of obesity in children, independent of nutritional habits.²⁵ In the United States, the prevalence of overweight among children has tripled over the past 30 years.¹⁸ This increase in overweight corresponds to a trend for sedentary activities such as watching television to replace recreational pursuits that involve more physical activity.^{7,52,56,81} Given the recent trends for computers in every home and classroom, such sedentary behavior will likely be reinforced. Robinson recently designed a randomized trial to reduce children's television watching with the hope that this would result in an increase in the youngsters' physical activity and fitness levels.⁹⁰ Although television watching time was reduced, no changes were found in activity and fitness. In contrast, Epstein et al. included both an addition of physical activity and a reduction of sedentary behaviors (such as television watching) in a weight reduction program for obese children.²⁸ School-related sedentary activities such as studying and doing homework were not targeted for reduction, only those performed during the children's "leisure" hours. Epstein found that both adding physical activity and reducing sedentary behaviors were effective in promoting weight loss and aerobic fitness in the children. A key component of the program may have been that Epstein et al. used a family intervention approach in their treatments.²⁸

It is important to note that children with the lowest physical activity/fitness levels and highest percentage of body fatness are most likely to develop other risk factors for CVD, including elevated blood pressure and serum cholesterol levels.^{27,107,117} However, it is encouraging to note that youngsters' lipoprotein profiles can be improved with

physical activity and exercise interventions.^{22,88} Also, weight loss can occur and blood pressure can be lowered in obese children when physical activity is an integral part of the treatment regimen.⁹¹

The heaviest children are more likely than their leaner counterparts to develop Type II diabetes, a serious condition that was seldom seen in youth before the number of overweight youth increased dramatically in recent years.³⁰ In 2002, research was published showing that modest weight loss and 150 minutes of physical activity per week could reduce the incidence of Type II diabetes in adults at high risk for the condition.²⁴ Although this research has not yet been replicated in children, it lends support for the urgency of helping children become physically active—especially those with body weights that could place them at risk for diabetes.

Unfortunately, some CVD risk factors tend to “track” over time.^{6,56,115} That is, if individuals have risk factors as children, they will likely keep them through adulthood. For example, a follow-up of the Harvard growth study of 1922-1935 showed being overweight during adolescence is a greater predictor of chronic disease development (i.e., CVD, arthritis) than being overweight as an adult.⁷⁰ Likewise, sedentary lifestyle habits may be formed at a young age,^{103,104} and aerobic fitness and physical activity behaviors tend to track throughout childhood, and possibly into adulthood.^{41,78,85} Dennison et al. found very inactive young adults had the lowest aerobic fitness scores (as measured by the 600-yard run) when they were youngsters.²³ In Finland, a longitudinal study showed children who were most sedentary had the least favorable CVD risk profile when they became young adults.⁸⁷

In adults, the relationship between physical activity and fitness and their combined influence on CVD risk is clear.^{9,54,76} In children, it is not known whether fitness or activity is the most important predictor for developing CVD in adulthood.^{81,94,116} Also, there is no consensus on whether regular physical activity will result in significant gains in aerobic fitness in children, particularly those who are prepubescent.^{69,83} Where relationships between fitness and physical activity in children exist, the associations are not strong.^{1,43,69,79} It is possible that large variability in children’s rates of growth and maturity make it difficult to correlate the fitness and activity variables.⁴³ Lack of strong association between fitness and activity in children may also be due in part to methodological problems. That is, while a number of valid and objective aerobic fitness tests have been developed, it is more difficult to quantitatively evaluate varying degrees of physical activity in youngsters.^{33,77,94} In any event, in a review of cross-sectional studies designed to measure children’s activity levels, Sallis found that boys are approximately 23% more active than girls; boys’ activity levels decline 2.7% per year, while girls’ decline 7.4% per year.⁹⁴ Similar findings were reported by Aaron et al.¹

Children may choose to be inactive for many reasons,

with poor self-efficacy for physical exercise playing a major role.²⁶ That is, the children may believe that they cannot perform sports and exercises very well, particularly when they compare themselves to their peers. Self-efficacy has emerged in the literature as a primary determinant of physical activity behavior and is known to vary with age, sex, and socioeconomic status. Self-efficacy is situation specific and its relationship to physical activity is often examined in relation to three components: efficacy for overcoming barriers to physical activity (e.g., being physically active despite having time constraints), efficacy for competing activities (e.g., being physically active after school instead of playing video games or other sedentary activities), and efficacy for support seeking (e.g., asking parents and/or friends to enroll them for activities or participate with them).

Several research studies have shown that different aspects of self-efficacy correlate with physical activity or predict physical activity behavior in children of all ages.^{2,11,26,82,108,109} Near adolescence, self-efficacy appears to play its greatest role in physical activity behavior. Highly physically active fifth and sixth grade boys and girls have shown higher self-efficacy, particularly efficacy for overcoming barriers.^{82,109} More inactive children have shown less self-efficacy in overcoming barriers, competing activities, and support seeking. In fact, self-efficacy for overcoming barriers is a significant predictor of physical activity in one study including a mostly African-American population of fifth graders.¹⁰⁸ Self-efficacy remains a strong predictor of physical activity through about ninth grade.^{2,11} During the high school years, it appears that girls begin to require more social influence to continue physical activity behaviors, while boys are still in need of enhanced self-efficacy.²⁶

More research is needed to examine social support, because it appears to be an important contributor to physical activity behavior. Regardless, both self-efficacy and social support are subject to parent and peer actions, which need to be considered in physical activity interventions. In addition, it is possible that fitness testing may result in negative reinforcement for low-fit children who perceive themselves as less able to perform physical activities than their peers.

Very young (four to seven year-old) children are much more likely to be physically active if their parents are active.⁶⁷ Reasons suggested for this phenomenon include (a) parents being role models, (b) parents structuring the family’s time in active pursuits, and (c) parents and children sharing a genetic predisposition to activity. Klesges et al. showed that parents’ actual participation in children’s activities, rather than just commanding them to be active, was more related to the activity levels of the pre-school child.⁴⁷ Similarly, Fogelholm et al. showed that parental inactivity is strongly related to sedentary behavior in the children.³¹ Family involvement and socialization appear to be keys to children’s physical activity patterns.²⁶

School Based Interventions

Schools have a unique opportunity to affect physical activity in that health-related activity programs can be incorporated into school curricula, as can assessment processes that can accurately measure activity changes as they occur. Officials from the CDC recommend schools take action to improve children's physical activity and fitness levels.⁴⁸ They also recommend that interventions to increase physical activity target school-aged youth to help break patterns of sedentary lifestyle that currently exist in the United States.⁵⁷

In Michigan, CDC's recommendations for school-based physical activity interventions are being carried out, in large part, through Michigan's *Exemplary Physical Education Curriculum (EPEC)*, a program of the Governor's Council. **EPEC** has been well received by physical educators in Michigan and elsewhere. Large numbers of teachers (> 2000 from Michigan and 22 other states) have completed the **EPEC** inservice trainings and/or are using **EPEC** materials.

Evaluation of **EPEC** instructional materials and inservice training is an on-going process. Much data have been collected and analyzed to date regarding the ease of use of the instructional materials by teachers, the effects of inservice training, and the effectiveness of **EPEC** on student outcomes.

In 1997, 100 elementary school physical education teachers representing 53 school districts across Michigan taught and evaluated the **EPEC** K-2 lessons. Over 95% of the teachers found the **EPEC** lessons to be clearly written, easy to communicate and implement, and developmentally appropriate. Teachers also perceived the lessons to be highly effective in accomplishing objective-based student outcomes,⁶⁵ and 98% of teachers indicated their eagerness to implement the **EPEC** lessons.

In 1999, the effectiveness of **EPEC** on student outcomes was investigated.⁶⁵ Study findings indicate that two of nine factors investigated appear to contribute significantly to school differences in student performance. The two factors are whether the teacher used the **EPEC** lessons and whether the teacher was certified with a major in physical education.

The significant differences in student performance observed between those students taught with **EPEC** and those not taught with **EPEC** include faster 600 yard run/walk scores (a field test of fitness) and higher self-reported personal/social behaviors (i.e., following directions). **EPEC** schools also had better motor skill performances (i.e., overhand throw and hop) than non-**EPEC** schools, although the differences were not statistically significant. This may be due to the small number of schools involved in the study and the resulting lack of statistical power.

Further effectiveness studies⁵¹ in 2000 found that students taught with **EPEC** improved significantly more than a

non-**EPEC** control group on knowledge tests of beneficial effects of exercise and constructive competition. **EPEC** students also improved significantly more than the control group on modified push-ups, push-ups, and ability to engage in constructive competition. Control students regressed significantly on ability to perform the flexed-arm hang, while **EPEC** students maintained their ability.

In early 2002, the Governor's Council on Physical Fitness was notified by the CDC that **EPEC** was the national award recipient for Achievement in Prevention Research and Research Translation in Chronic Disease. The award recognizes significant contributions in program development, evaluation and/or dissemination to reduce the burden of chronic disease.

Although they have not been widely implemented, numerous policy recommendations have been directed toward teachers and principals for greater emphasis on health-related objectives and more class time devoted to on-task practice/participation.^{15,37,39,58,72,100,102}

Innovative strategies for school-based intervention to improve health risk in students have been introduced in virtually all grade levels.^{12,35,38,39,44,71,84,95,98} Interventions are typically based on social learning theory where children or adolescents learn together and explore information provided by the teachers. Along with information on diet and proper nutrition, children learn about exercise and physical activity. These topics can be easily integrated into subject areas such as science, math, and language. Results have shown an increase in exercise self-efficacy and positive behavior changes. Common denominators for all these programs include knowledgeable and cooperative teachers and administrators, and a district firmly committed to the programs. Results of some of the more recent interventions are discussed below.

Sallis et al. implemented a comprehensive sport and physical education program for fourth grade children attending seven different schools.⁹⁵ The program was titled *Sports, Play, and Active Recreation for Kids* (Project SPARK). Lessons in the intervention schools were taught either by physical education specialists or classroom teachers. Typical physical education classes served as a control. After two years, results showed that when the intervention was taught by physical education specialists, more lessons were taught, for longer periods of time. Girls taught by specialists showed significant improvements in abdominal strength and cardio-respiratory endurance compared to girls taught by classroom teachers. However, neither intervention condition resulted in an increase in out of school physical activity compared to the controls.

Gortmaker et al. developed an intervention that included an innovative physical education curriculum taught to fourth and fifth graders over two years.³⁵ Instruction included physical activity sessions as well as didactic

sessions regarding the effect of exercise on health. Regular classroom teachers provided instruction. There was no significant change in children's self-reported physical activity levels by the end of the program.

More positive results were found in the *Cardiovascular Health in Children* (CHIC) study published in 1996.⁵⁸ This was a randomized-control field trial of third and fourth graders in 12 schools. The intervention was an eight-week, three-days-per-week exercise program that included active learning sessions. Post-test results (two weeks following the intervention) show increased self-reported physical activity in the students in the intervention schools, compared to those attending the control schools.

One of the most successful school/home interventions has been the *Child and Adolescent Trial for Cardiovascular Health* (CATCH) study.⁷¹ It was a randomized trial of 56 intervention and 40 control schools in four geographic locations in the United States. Physical education specialists and classroom teachers had special training in an innovative approach to teaching physical activity. Children in the intervention schools showed greater self-reported physical activity at the conclusion of the three-year trial. Even more impressive was the fact that differences in physical activity between intervention and control school students persisted for an additional three years, without further intervention.

Most of the interventions described above contain lessons on proper nutrition, and how diet and exercise are interrelated.^{35,71} In many cases, improvements in children's knowledge, beliefs, and practices regarding food choices superseded improvements in physical activity behaviors. This is an important component of any comprehensive health risk behavior intervention. The importance of accurate nutrition information for school children has been recognized in Michigan, where about one out of four Michigan high school girls reported the dangerous dieting practices of going without eating for 24 hours or more (19% of girls) or vomiting or taking laxatives to lose weight (9% of girls) in 2001.⁶⁵

Although the recent intervention strategies described above show mixed results, the CDC strongly encourage schools and communities to aggressively promote physical activity in children and adolescents. They first published guidelines for such efforts in 1997.¹⁵ Among the many recommendations are (a) implementing daily physical and health education for all students from K-12, (b) hiring properly trained physical education specialists, and (c) developing curricula that help students achieve an active lifestyle that will persist into adulthood. They also emphasized that active learning should progress from the classroom into the community, where programs can be developed to meet the needs of the majority of children. Such programs can work most effectively if schools and communities set policies to insure that programs are carried out in a professional manner, with adequate resources, and evaluated in a regular, systematic fashion.

Implications for Public Policy

In recent years, recognized experts and government policy makers have released specific recommendations for youth physical activity. In 1995, the CDC and the American College of Sports Medicine (ACSM) published joint recommendations concerning physical activity.⁸⁰ Regarding youth, the recommendations emphasize the importance of schools designing curricula for all children that (a) are enjoyable, (b) build self-efficacy related to exercise performance, (c) include significant amounts of physical activity, and (d) involve a cognitive component that addresses lifelong fitness activities and habits. Since children also spend much time away from school, educators should ensure that their students are familiar with exercise facilities in the local community. The recommendations also stress parental involvement as role models for their children's exercise behaviors.

Also in 1995, the National Institutes of Health *Consensus Statement on Physical Activity and Cardiovascular Health* was published.⁷³ The authors conclude that: "children and adults alike should set a goal of accumulating at least 30 minutes of moderate-intensity physical activity on most, and preferably, all days of the week."

In 1996, the U.S. Surgeon General's *Report on Physical Activity and Health* was published.¹¹⁵ One of the major and most clearly stated recommendations mirrors the NIH Consensus Statement: "All people over the age of two years should accumulate at least 30 minutes of endurance-type physical activity, of at least moderate intensity, on most, preferably all days of the week." The report went on to clarify that "more benefit can be obtained from vigorous activity performed on a regular basis."

The Surgeon General's report also made a strong case for school-based interventions, asserting that "school-based interventions have been shown to be successful in increasing physical activity levels. With evidence that success in this arena is possible, every effort should be made to encourage schools to require daily physical education in each grade and to promote physical activities that can be enjoyed throughout life."

In 1997, the Centers for Disease Control and Prevention released *Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People*.¹⁵ These guidelines went beyond exercise recommendations to suggest policies that schools and communities should implement for promoting physical activity for youth. The guidelines also included some very specific policy suggestions for physical education—that students at every grade level should take physical education classes that meet daily and should be physically active for a large percentage of class time.

Several important national policy reports were issued in 2000 with recommendations for increasing physical activity for American youth. The first of these, *Fit, Healthy, and Ready to Learn: A School Health Policy*, was

issued by the National Association of State Boards of Education.⁷² This report made a strong argument for the vital importance of school health programs to combat physical inactivity. Sample policies were put forth—policies related to physical education, extracurricular activities, recess, access to school facilities, and a health education curriculum that reinforces the importance of physical activity.

In the fall of 2000, the report *Promoting Better Health for Young People Through Physical Activity and Sports* was released jointly by the Secretary of Health and Human Services and the Secretary of Education, in response to an Executive Order from President Clinton requiring the two national leaders to identify and report “strategies to promote better health for our nation’s youth through physical activity and fitness.”¹¹⁴ This report called for multiple approaches to helping children increase their levels of physical activity and fitness, approaches originating from families, school programs (daily physical education, health education, recess, and extracurricular activities), after-school care programs, youth sports and recreation programs, community structural environments supportive of healthy physical activity, and media campaigns that help motivate young people to be physically active. See Appendix A for a list of the specific recommendations.

In November of 2000, *Healthy People 2010* was released.¹¹² *Healthy People 2010* is the most recent version of national health targets, which were originally published in 1979. These targets are a set of health promotion and disease prevention goals and objectives designed to increase the overall health of the American people. Six objectives set specific goals for physical activity in young people. These objectives center around increasing the proportion of adolescents that engage in both moderate physical activity (> five days per week) and vigorous physical activity (> three days per week). They also emphasize the need for schools to require daily physical education for all students, and for students to participate in daily physical education. The proportion of time during physical education class that students spend being physically active should be high (> 50% of class time) and television viewing outside of class should be low (< two hours per day). See Appendix B for a list of the specific objectives for physical activity in children and adolescents.

Summary and Potential Impact on Citizens of Michigan

The risk profile for developing CVD in Michigan citizens is very unfavorable. Twenty-four percent of our adult population smoke, 32% have been told they have high serum cholesterol, and 25% have been told they have high blood pressure.⁵⁹ In addition, far more Michigan adults are overweight (61%) than the national average (57%) and 75% of Michigan residents report that they are not regularly active.⁵⁹ These numbers are sobering. Increasing regular physical activity among Michigan residents is an urgent public health priority. If Michigan

citizens can be encouraged to increase their levels of physical activity through educational programs and environmental restructuring, improvements in cardiovascular health and reductions in other chronic conditions can be expected.

Michigan has a solid history of taking the lead nationally in many areas affecting the health and economic well being of its citizens. Michigan continues the tradition of leadership in its innovative initiatives to promote physical activity for children by addressing not only the need for quality education, but also the need to improve the social and physical environments that affect all our citizens’ ability to be physically active.

- Michigan’s **EPEC** program is a major public health initiative to combat physical inactivity, being carried out completely in the education arena. It represents a model partnership between the Governor’s Council, and the public health and education communities working together toward a healthy future for our citizens. It meets the public health goal of graduating physically educated persons who are prepared to be physically active for life and the education goal of providing quality curriculum and instruction based on experts’ definitions of what students should know and be able to do. Most importantly, on-going evaluations indicate **EPEC** instruction is effective. With widespread implementation, **EPEC** is expected to have a positive long-term impact on the health of Michigan residents.
- Michigan’s promotion of active community environments is another long-term investment in the health of residents. Helping communities understand how the environment can profoundly affect health is an important new role for the Michigan Department of Community Health and the Governor’s Council on Physical Fitness, Health and Sports. The new statewide initiatives in this area—community self-assessments as part of the Promoting Active Communities award, the Safe Ways to School initiative, and trainings for communities to enhance walkability—are moving Michigan toward becoming a healthier place to live, for both children and adults.

APPENDIX A

Promoting Better Health for Young People Through Physical Activity and Sports

A Report to the President from the Secretary of Health and Human Services and the Secretary of Education

Recommendations from Executive Summary

Our nation's young people are, in large measure, inactive, unfit, and increasingly overweight. In the long run, this physical inactivity threatens to reverse the decades-long progress we have made in reducing death from cardiovascular diseases and to devastate our national health care budget. In the short run, physical inactivity has contributed to an unprecedented epidemic of childhood obesity that is currently plaguing the United States. The percentage of young people who are overweight has doubled since 1980.

Physical activity has been identified as one of our nation's leading health indicators in *Healthy People 2010*, the national health objectives for the decade. Enhancing efforts to promote participation in physical activity and sports among young people is a critical national priority. That is why, on June 23, 2000, President Clinton issued an Executive Memorandum directing the Secretary of Health and Human Services and the Secretary of Education to work together to identify and report within 90 days on "strategies to promote better health for our nation's youth through physical activity and fitness." The President concluded his directive: "By identifying effective new steps and strengthening public-private partnerships, we will advance our efforts to prepare the nation's young people for lifelong physical fitness."

To increase their levels of physical activity and fitness, young people can benefit from:

- **Families** who model and support participation in enjoyable physical activity.
- **School programs**—including quality, daily physical education; health education; recess; and extracurricular activities—that help students develop the knowledge, attitudes, skills, behaviors, and confidence to adopt and maintain physically active lifestyles, while providing opportunities for enjoyable physical activity.
- **After-school care programs** that provide regular opportunities for active, physical play.
- **Youth sports and recreation programs** that offer a range of developmentally appropriate activities that are accessible and attractive to all young people.
- **A community structural environment** that makes it easy and safe for young people to walk, ride bicycles, and use close-to-home physical activity facilities.
- **Media campaigns** that help motivate young people to be physically active.

U.S. Department of Health and Human Services. *Promoting Better Health for Young People through Physical Activity and Sports*. A Report to the President from the Secretary of Health and Human Services and the Secretary of Education. Centers for Disease Control and Prevention, P.O. Box 8817, Silver Springs, MD 20907

Available at: www.cdc.gov/nccdphp/dash/presphysactrpt/summary.htm

***Healthy People 2010** Objectives for Improving Health**

Objectives for Physical Activity in Children and Adolescents

- Objective 22-6: Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on five or more of the previous seven days. (The 2010 target is 30%. Baseline estimates for this measure from 1997 were 20% for adolescents in grades 9-12. Adequate baseline data do not exist for younger children.)
- Objective 22-7: Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness three or more days per week for 20 or more minutes per occasion. (The 2010 target is 85%. Baseline estimates for this measure from 1997 were 64% for adolescents in grades 9-12. Adequate baseline data did not exist for younger children.)
- Objective 22-8: Increase the proportion of the nation's public and private schools that require daily physical education for all students. (The 2010 targets are 25% for middle schools and 5% for high schools. According to 1994 data, 17% of middle schools and 2% of high schools nationwide required daily physical education for all students. While the CDC has recommended that daily physical education programs be available for all grade levels, no states have adopted this level of recommended programming.)
- Objective 22-9: Increase the proportion of adolescents who participate in daily school physical education. (The 2010 target is 50%. The baseline estimate for this measure from 1997 was 27% of students in grades 9-12.)
- Objective 22-10: Increase the proportion of adolescents who spend at least 50% of school physical education class time being physically active. (The 2010 target is 50%. The baseline estimate for this measure from 1997 was that 32% of students in grades 9-12 were physically active in physical education class more than 20 minutes, three to five days per week.)
- Objective 22-11: Increase the proportion of children and adolescents who view television two or fewer hours per day. (The 2010 target is 75%. Based on data collected from 1988-94, 60% of persons aged 8-16 viewed television two or fewer hours per day.)

**Healthy People 2010*¹² is the most recent version of national health targets, which were originally published in 1979. These targets are a set of health promotion and disease prevention goals and objectives designed to increase the overall health of the American people. Fifteen of the *Healthy People 2010* objectives pertain to physical activity and fitness. Objectives 22-6 through 22-11 refer specifically to physical activity in young people.

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