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Preface

Some may prefer that a report of current research wait until a full delineation of data support on activity is available and occur after years of application. In some ways much of the research reported has been confirmed over repeated applications for over 20-30 years.

The role of research relative to coronary heart disease and activity and aging, including motor control, balance, strength, osteoporosis and enhanced mental function has also been well documented over the past two to three decades.

More recently, however, within the past ten years have been important links to cancer research, specifically colon and breast cancer, and the most recent research have shown the role activity in the prevention of Diabetes, Type II.

Also in recent years has been supportive research data that shows important mental health benefits, specifically depression and stress reduction and the latest important information on cognitive function. Cognitive function has been most interesting finding, since with the increase in the importance of reading, literacy and math scores, the role of physical activity in the enhancement of these plus academic function becomes significantly important. Many studies have shown improvement in academic performance, which could be explained by increased blood flow to the brain and increased alertness. These responses have been well documented with the elderly prior to the study of children. However, as more sophisticated methodology and instrumentation in brain research, possible changes in cell function brain chemistry has been presented as possible explanations for the enhanced academic performance.

More difficult to validate have been studies in the area of social interaction skills. Although activity, games and sports have often been attributed to reduction in delinquent behavior. There have been a paucity good research in socialization skills in order to validate such claims in controlled settings. Obviously, the teacher, coach, parents and peers play equally important roles in effecting positive change.

Overall, however, when looking at the effects of research over the past three decades there is insurmountable evidence in support of the importance of physical activity and physical education for children.

It is obvious that important positive attitudes and lifestyle behaviors have significant links to one's early years. The authors hope that this information will help to bring to the forefront the importance of physical activity and physical education in a child's life and has presented supporting data from the myriad of locations, ages, etc., that will help the reader not only to better understand the importance, but also help convince others such as parents school administrators and government officials, those who are in position to make decisions about education.

Introduction

As funds for education and community support have become limited, it has become increasingly clear that many governments are failing to support a physical activity initiatives to a level required to turn around the current "inactivity crisis" as reported by Koop in his 1999 press release. The reduced support has resulted in a decrease in the Health of Our Nation and endangers not only the quality of life and health status of all citizens of the world.

Mainly due to modern technological developments (e.g. cars, elevators, computers, television) within almost all cultures, both children and adults have become less physically active. In some cultures, inactivity and the resultant obesity and diseases have reached "crisis proportions" (Koop, 1999). When one considers the role of physical activity upon disease prevention, both physical and mental, the increased level of inactivity can have devastating effects on health care costs and the economy. Feingold (1994) extrapolating US Government figures analyzed that one year less disease over a lifetime can save taxpayers in New York State approximately 3-5 billion dollars a year in health care costs. The National Center for Disease Control in their Fall, 2000 report on physical activity noted, "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 in reducing deaths from cardiovascular diseases. Ultimately this could have a devastating impact on 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".

Besides the role of physical activity on disease prevention, both physical (cardiovascular disease, diabetes, colon cancer, obesity and osteoporosis) and mental (depression and stress), physical activity, games and sports, can play a significant role in the enrichment of social life and the development of one's social interactions skills.

People of all ages, young through the elderly, by increasing numbers, have discovered the value of participation in organized activity, games and sports clubs. This valued connection to groups and positive social interactions is of particular importance to individuals in our modern societies. These same modern societies, unfortunately, may now be characterized by their increased complexity, instability, stress, fragmentation of family units, and increased violence in the school and community. Today, many are aware that a physically active lifestyle and participation in games and sports significantly contribute to one's health, social well-being, recreation and therefore to the quality of one's life.

However, the adoption of an active lifestyle does not occur without some organized effort within the schools, communities and governmental agencies. The Be Active America initiative promoted by the New York State Coalition on Physical Activity (NYSPAC) provides for such an organized framework, utilizing schools, teachers, parents communities and governmental agencies in a collaborative framework to enhance the quality of life and health initiatives. Thus, given that modern technological developments in labor and transportation have generally resulted in physical less active lifestyles, youngsters have become less physically active as a result of the advance of television, computer games and Internet and the decrease of safe outdoor playing grounds, societies have become more complex and stressful and juvenile delinquency and deviant behavior is becoming more plentiful due to the weakening of social units, such as the family, the increased level of inactivity has devastating effects on the costs of health care and the general economy, and a physically active lifestyle contribute to physical and mental health, well-being and social responsibility.

Likewise, governmental agencies of all countries would do well to favor physical activity as a lifestyle issue in order to enhance lifestyle and prevent health care costs.

It is recommended that those official with the responsibility for the health and well-being of its citizens, should strongly propagate and stimulate the adoption by youngsters, adults and the elderly a physically active lifestyle.

Feingold, R.S (1994), "Making Connections: An Agenda for the Future", *Quest*, 46(3), 356-366

Koop, C.E. (1999), former US Surgeon General, Press Release, June 9.

CDC (2000), "Promoting Better Health for Young People through Physical Activity and Sports", Walsh, DC. P.1.

The importance of physical activity for persons of all ages has been well documented, but, unfortunately the importance of physical education for the development of life-long physical activity habits and health promotion or the importance of participation in physical education in the development of social skills needed by our society, nor the importance physical education in the development of cognitive function have not been well understood or articulated beyond the community of physical educators. Misconceptions about the importance of physical activity for young people among policy makers, administrators, parents and school board members have contributed in a steady decline of physical education in schools across the nation.

The value of communications to ALL components of our society, teachers, parents, government officials can not be over estimated. The growing body of research evidence and positive statements makes for a compelling case for physical education. This text is written in order to provide, in a simple and understandable format, compelling research evidence in "Making a Case fir Physical Education".

IMPROVED HEALTH & WELL-BEING

It has been a common understanding that physical activity can provide life-long benefits directly related to preventing disease and to maintaining a high quality of life. Physical activity has direct effects upon the various systems of the body, including cardiovascular, pulmonary, neural and muscular among others. It reduces the risks associated with obesity, high blood pressure, colon cancer, diabetes II, osteoporosis, coronary heart disease and physical ailments associated with a sedentary lifestyle. In addition, it has recently been shown to unique not only physical health, by reduction in stress, anxiety, depression as well as enhancement of self-esteem.

Health Benefits on Children (Activity)

It has been found that obese children are less active, while activity not only may reduce obesity, but also reduce blood pressure, enhance blood lipid profile, and build bone tissue.

Bar-Or (Dec, 95), "Health benefits of physical activity during childhood and adolescents", President Council on Physical Fitness.

Health Benefits of Children (Activity)

An active lifestyle during childhood was found to be a direct to one's health in later years. In other words, it was found that an active child becomes an active adult.

Blair, et al., (89), "Exercise and fitness in childhood: Implications for a lifetime of health", in Gisolfi and Lamb, Perspectives in Exercise Science.

Disease Prevention and Childhood

It has been known for sometime that clinical manifestations of CHD (Coronary Heart Disease) can appear as early as the school-aged population, and that many of the risk factors associated with coronary heart disease are largely a result of behavioral patterns established in childhood.

World Health Organization. Prevention in childhood and youth of adult cardiovascular disease: time for action. Report of the World Health Organization, Expert Committee, Geneva, Technical report Series, 1990, 792.

Others studies support reduced CHD risk factors in childhood as a result of physical activity.

Al-Hazzaa, H.M., et al., "Cardiovascular fitness physical activity patterns, and coronary risk factors in preadolescents boys," *Int J. Sp. Med.* 15:267-272, 94.

Raitakari, O.T., et al., "Effects of persistent activity and inactivity on coronary risk factors in children and young adults" *Am. J. Epidemiology*, 140:195-205, 1994.

Health Benefits

Physical activity may constitute a more important risk factor than the other three major risk factors combined.

US Department of Health & Human Services, 1987.

Activity and Breast Cancer

Physical activity has been shown to reduce the onset of breast cancer.

Thune, I., Brenn, T., Lund, E. Et al., "Physical activity and the risks of breast cancer", *N. Engl J Medicine*, 1997, 336(18):1269-1275.

Activity and Obesity

In a study, 36 overweight children, 35 (97%) had three or more coronary risk factors.

Parker, D. and Bar-Or, O. "Juvenile Obesity: The importance of exercise", *Physician and Sports Medicine*, June, 91, 19(6), 113-116.

Activity and Obesity

"Enhanced physical activity is a major component in weight management of obese children and adolescents. Reduction in body fat is only one objective. Others benefits include improved self-esteem, increased aerobic fitness, a decrease in resting blood pressure, and an improved plasma lipid profile."

Bar-Or, O., et al., "Physical activity, genetics and nutritional considerations in childhood weight management", *Medicine and Science in Exercise and Sport*, 30(1), Jan, 1998.

Health Benefits and Activity

"New scientific studies indicate that fitness may contribute more to a long, healthy life than any other factor, including quitting smoking. Moderate regular activity reduces the likelihood of high blood pressure, heart disease, colon cancer and depression".

Koop, C. Everett, former US Surgeon General, June 9, 1999, press release.

Activity and Obesity

Becque and Katch, et al., found that obese children also tend to have high levels of serum triglyceride, VLDL, LDL and high blood pressure. The authors noted that if these behaviors were to be continued into adult years, one will exhibit a decrease in health. "If obesity is maintained to adult years, obesity is associated with several diseases, such as hypertension, cerebrovascular disease, and diabetes."

Becque, M.D., Katch, V., et al., "Coronary risk incidence of obese adolescents: reduction by exercise plus diet intervention". *Pediatrics*, 1998, 81(5), 605-12.

Moderate Physical Activity

Moderate Activity is associated with a decrease in all-cause cancer rates, and specific protection against tumors of the descending colon. There are also suggestions of benefit at other sites, including the lungs, and, in women, the cervix and the breast. US Surgeon General, *Physical Activity and Health*. US Dept of Health and Human Services, 1996.

Breast Cancer

After testing 25,624 women, it was concluded that breast cancer is significantly reduced in those who regularly exercise.

Thune, I. Brenn, T. Lund, E. Et al., (1997) *Physical activity and the risk of breast cancer*, *New England medicine*, 336:1269-1275 6-17

Colon Cancer

Data were available on 67,802 subjects representing 385,819 person years of follow-up. It was found that as leisure-time activity increased, the risk of cancer of the distal colon decreased significantly. Even activities of moderate intensity performed for 1hr/day significantly reduced the risk of colon cancer.

Martinez, M.E, Giovannucci, E., Spiegelman, D. et al. (1997). Leisure time physical activity, body size, and colon cancer in women. *J. national Cancer Institute* 89:948-955

Cancer

NKC can initiate spontaneous cytolytic activity against virally infected and malignant cells without requiring antibodies and antigens. Acute exercise includes a transient increase in natural killer cytolytic activity just after exercise.

Strasner, A, Dacis, J.M., Kohn, M.L., et al (1997). Effects of exercise intensity on natural killer cell activity in women. *Int. J. Sp. Med.* 18:56-62.

Fatty Acids

22 healthy, untrained volunteers aged 35-55 exercised on cycle ergometers at 50%-55% of max heart rate for 1hr. Blood samples before and after exercise showed nonesterified fattyacids (NEFAS) significantly increased and total glucose significant decreased over the low exercise group. This finding adds to the supportive role of activity and beneficial effects of exercise.

Mougios, V. Kouidi, E., Kyparos, E., et al. Effects of exercise on the proportion of unsaturated fatty acids in serum of untrained middle-aged individuals. *British J. Sports Med.*, 32:58-62, 1998.

Fatty Acids

Plasma lipoprotein levels were studied in 180 postmenopausal women (45-64) and 197 men (30-64) with low HDL and moderately increased LDL cholesterol levels. Persons were placed into one of four groups, a) in exercise alone, b) moderately low fat diet, c) diet plus exercise, and d) no intervention. The results show that exercise and exercise with diet had beneficial effects on HDL; diet and exercise had the best results on lowering LDL; however, diet alone did not appear to have the same positive effects. Thus, the results showed that exercise was a key ingredient in enhancing blood fat chemistry levels.

Stefaick, M.L., Mackey, S. Sheehan, M. et al., Effects of diet and exercise in men and postmenopausal women with low levels of HDL Cholesterol and high

levels of LDL Cholesterol (198). *New England J Med* 339:12-20.

Osteoporosis

9,704 women aged 65+ enrolled in the study of osteoporotic fractures to determine the association of types, amounts and intensity with the risk of fracture in older women. The results showed that the risk of hip fracture decreased with increasing amounts of physical activity. It was lowest in women who engaged in at least 2hr of sport or recreation/week. Hip fracture risk is increased with the amount of sitting time/day.

Gregg, E.W. Physical activity and osteoporotic fracture risk in older women. *Annals internal medicine* 129:81-88, 1998.

Osteoporosis

2325 women with a mean age 68.8 yrs participated in the third national health and nutrition examination survey. The results indicate that activity 2 or more times/wk significantly reduced the incidence of hip fractures. Inactive women were 48% more likely to experience a fracture than the active group. Physical activity was shown to be more important than heredity, smoking status, alcohol use and dairy product intake in determining the risk of fracture.

Turner, L.W., Lever-Dunn, D., Brezzo, R., et al., (1998). Physical activity and osteoporotic fracture among older women. *J. Athletic training* 33:207-210

Osteoporosis

Osteoporosis or fragility of bones has likewise been linked to PA. Although an active adult may prevent some levels of osteoporosis, it has been found that the most critical time in laying down bone tissue and thus prevent osteoporosis is during one's adolescence. In other words, it is the activity one has when young that is essential in the development of strong bones and the reduction of adult osteoporosis.

Examined the past history of 204 women aged 18-31 and found high school activity over a five year period significantly correlated with bone mineral density in the hip. The investigators concluded that since research suggests that bone growth in the hip may reach its peak by age 16, high school activity may represent the best line of defense against osteo.

Teegarden, Proulx, et al., (1996). Previous PA relates to bone mineral measures in young women *MSSE* 28, 105-113

Health Behaviors, Smoking and Physical Activity

Comparing 1015 school children between 12-15 yrs of age, Boreham, et al., found that the level of physical activity was positively associated with blood pressure, lipid profile, and cardiovascular fitness. Girls were also associated with reduced fatness. An interesting finding of this study found that boys who participated in 4 or more sessions of activity/week, only 12% admitted smoking, while those who participated in activity 1 day or less/week, 34% admitted to smoking. In other words, children who

were more active smoked less than those who were less active. The authors found this to be important since smoking patterns usually began at this age.

Boreham, L.A., et al., "Physical activity, sports participation, and risk factors in adolescents," *Medicine and Science in Sport and Physical Activity*, June, 97, 29(6) 788-793.

All Cause Mortality

The sample included 40,417 women who returned an activity questionnaire. 18,940 had low activity, 10,987 moderate activity, and 9,919 high activity. The status was followed for seven years and the results showed that the higher levels of physical activity were associated with a decreased risk of death. It was noted that activity performed even once a week had beneficial effects when compared to no activity.

Kush, L.H., Fee, R. M., Folsom, A.R. et al., (1997) Physical activity and mortality in postmenopausal women. *JAMA* 277:205-210, 1996.

IMPROVED MENTAL HEALTH

Besides the physical health and well-being of persons who participated in physical activity, less well-known are many of the positive effects upon the mental health of the person. Increased stress, increased disconnection from one self, increased lack of control regarding one's life that can bring meaning, can bring enhanced self-concept and self-determination. For many research evidence have supported the role of physical activity in the reduction of stress, depression and enhanced self-esteem.

Activity and Mental Health

Activity has been shown to have favorable effects on anxiety, depression, mood, self-esteem and some measures of cognition.

Biddle, S. (95). "Exercise and psychosocial health", *Research Quarterly* 66(4), 292-297.

Activity and Mental Health

Twenty-seven studies showed that activity reduces anxiety and has been used to treat depression. Landers notes that "research literature suggest... there is ample evidence that a definite relationship exists between activity and mental health."

Landers, D (97). "Influence of exercise on mental health", *President's Council on Physical Fitness*.

Psychological Benefits

A general health questionnaire was given to 16,500 and a follow-up given to 2223 boys and 2838 girls. The general health questionnaire assessed emotional well-being. The conclusion indicated that for adolescents and adults, emotional well-being is positively associated with regular physical activity. The authors encourage active lifestyles among adolescents as a way to contribute to their improved mental health.

Steptoe, A. And Butler, N. Sports participation and emotional well being in adolescents. *Lancet* 347:1789-1792, 1996

Psychology

Following a 12 wk aerobic fitness program, 82 adults completed the Beck Depression Inventory, Profile of Mood States, State-Trait Anxiety inventory, and the Tenn Self-concept scale. Physiological parameters included changes in Max work load, pred max Vo2 and sub max Hr for a pre-determined workload. As expected the physiological parameters or fitness levels increased over the 12 wk period. In addition, all psychological tests improved as well. After 1 yr follow up tests indicated positive changes remained. The authors concluded that the psychological effects or benefits of activity remain for short and long term.

Dilorenzo, TM, et al (1998) "Long term effects on psychological outcomes" *P med*, 75-85.

Hassman, et al (1997) had 3043 Finish adults (25-64) complete the CV Risk factor survey, Beck Depression Inventory, the Cynical distrust scale, and the sense of coherence inventory.

The results showed that those who exercise at least 2-3 times/wk experienced significantly less depression, anger, distrust, and stress than those exercising less frequently or not at all. Those who exercised also had higher levels of a sense of coherence and a stronger feeling of social integration.

Hassman, Peter et al () "Physical exercise and psychological well-being: a population study in Finland", *P/Med* 17-25.

IMPROVED SOCIAL SKILL DEVELOPMENT

For numerous years, it was suspected that game participation in group settings was essential to the development of social skills, such as cooperative behavior, problem solving, leadership and followership, respect for others, caring and sportsmanship. What many did not understand was that the development of these social skills do not necessarily on their own.

Instead they need to be planned for, nurtured and developed in an environment controlled by a professional teacher who understands the potential positive impact on children and recognizes the various environmental manipulations and feedback schemes for their development.

The importance of the development of the skills cannot be overemphasized. With each succeeding year, competition in our society has brought forward some of our ugly characteristics, including win at all costs, crime, drug abuse, child abuse, unethical behavior, lack of caring for others, cultural bigotry, war and terror.

Obviously, physical education can not solve all of the problem in our society and world; however, there is enough evidence to show that under the right environment and directed by a professional understanding teacher, there can be change in some of our young people.

If one were to consider the gymnasium and field as a laboratory about life, where real-life situations occur on a regular basis, conflict, cheating,

taking advantage, violence, embarrassment and others that emit total responses of the person, physical mental and emotional. On the other hand, it can be a laboratory about life where positive social skills are developed.

Social Behavior and Games

Cooperative game structure with young children have generally been found to be beneficial in promoting prosocial behavior.

Shields and Bredemeir (95). *Character Development & Physical Activity*, Human Kinetics, III.

Sage reports the beneficial effects of play in the development of social skills in young children.

Sage, G. *Academy Papers* 19.

Fairplay and Physical Education

Students introduced to the Canadian Fair Play Curriculum showed a significant difference from the control on moral judgment, reasoning and intention scores.

Gibbons, S. *Ebbeck*, V. and Weiss, M. "Fairplay for kids: effects on the moral development of children in physical education," *Research Quarterly*, 1995, 66(3), 247-255.

Social Skills and Activity

"...social development in physical education classes present situation in which young people are required to interact with each other...in a way that is different from the standard academic environment..."

Mutrie, N. (97). *Young and Active Symposium*, Health Education Authority, London.

Social Theory and Exercise Adherence

Utilizing results from studies on exercise adherence as well as social cognitive theory, it was found instruction should include self-monitoring, goal setting, self-confidence, and skill development in a positive enjoyable setting.

Dishman, R., Sallis, J.F. "determinants and interventions of physical activity and exercise", *Physical Activity, Fitness and Health. Int Proceedings and Consensus Statement*, Bouchard, C., Shepard, R.J. and Stephens, T. (Eds), *Human Kinetics*, Publ, 1994, 214-233.

Delinquency and Activity

Mutrie (97) in a literature review found several authors concluding that there was a negative relation between physical activity and juvenile delinquency.

Mutrie, N. (97). "Physical activity and its link with mental, social and moral health in youth", *Young and Active Symposium*, London.

McMahon, J. (90). "The psychological benefits of exercise and treatment of delinquent adolescents". *Sports Medicine*, 9, 344-351.

Social Skills

Hellison, D. (1991), The whole person in PE, *Quest* 43, 307-318, p 308 noted that "today's children... need personal and social values and skills that will help them navigate through the myriad of social problems that infuse their lives."

Delinquency

Various theories have been proposed to help explain why one gets involved in delinquent behavior. Social strain, school failure, family environment, and boredom are few explanations for delinquency prevalence.

Yin, et al., investigated the typology of leisure using ALTAS survey. 2651 Mexican American adolescents were investigated. Results indicate that a higher level of involvement in delinquency was significantly associated with increased participation in unsupervised socialization - with friends and decreased with supervised leisure and sporting activities, i.e., those who reported participation in supervised leisure activities were less involved in delinquent behavior.

These results show strong support for counseling students to participate in organized school activities, especially those that require socialization skills, team building and networking with friends through positive physical and leisure activities.

Yin, Zenong. D. Katins, J. Zapata, Hispanic J of Behavioral Science, "Participation in leisure activities and involvement in delinquency by Mexican adult adolescents"

IMPROVED ACADEMIC PERFORMANCE AND COGNITIVE DEVELOPMENT

Besides the physical and mental health benefits of physical activity as well as the development of positive social skills, the role physical activity may have its greatest impact on cognitive function. Recently, there is developing a body of research that supports physical activity and academic performance as well enhanced brain function.

Although the jury is still out, with the importance on academics and in particular math, reading and problem solving, the effects of physical activity on each requires further investigation.

Activity on Cognition

Comparing 6-12 yr old children who received 5 hrs to 40 min of activity per week found those with more activity showed significant positive difference in academic performance.

Shepard, R and Lavelle, R (94). "Academic skills and required physical education." *CAHPER, Research Suppl.*, 1(1), 1-12.

Activity on Cognition

Numerous studies have shown that by adding activity to children's curriculum, thereby reducing time on academic subjects, they found no reduction on grades and standardized tests, and many were found to improve their grades and academic learning.

Shepard, R. (97). Curricular physical activity and academic performance. *Pediatric Exercise Science*, 9,

113-126. Sallis J., and McKenzie, T., et al. (99). *Research Quarterly*, 70(2), 127-134

Cognitive Ability and Activity

Shepard notes that enhanced reading, language and motor performance resulted from increased blood flow to the brain, increased arousal and attentiveness. "...physical education can be introduced when a child enters primary school without compromising academic performance."

Shepard, R. (97). Curricular physical activity and academic performance. *Pediatric Exercise Science*, 9, 113-126.

HEALTH CARE COSTS

Given the many benefits to one's health, both physical and mental, it has been estimated that the health care savings from moderate activity throughout one's life may be considerable. A few studies have recently reported on these savings and in all cases the savings are considerable.

Health Care Costs

One year less disease over a lifetime (75 yrs) will save 3-5 billion dollars a year in health care costs for the State of New York alone.

Feingold, R. (94). *Quest*, August, 356-366.

Health Care Costs

Shepard, R.J. and Montelpare, W. In a retrospective study found that physical activity at the age of 50 had a substantial effect in protecting seniors against institutionalization in later years, associated health care costs.

Shepard (1998), Geriatric benefits of exercise as an adult. *J. Gerontology*, 43:M86-m90

TRACKING

An obvious important relationship must occur in order to make a case for physical activity and physical education in the schools. Specifically what is the relationship between activity while young and activity in adulthood. There is increased evidence that what positive experiences and habits of the mind occur while young will have increased tendency to participate in those activities as an adult. It is also obvious that negative experiences while young will reduce those experiences later in life. Therefore it is not only necessary to have activity while young, but equally important is to have positive experience, develop skills in a caring and open environment and develop knowledge about the body and program develop through a conceptual approach in supportive and fun activities. With the above in mind, not only is the conceptualization of the physical education program becomes essential but also the expertise of the instruction. There are development of fitness education concepts (Corbin), and the development of social skills (Hellison)

Tracking

An obvious question has been related to tracking or what if any relationship exists between activities when young and activity as adults. Also what risk factors that show up when young continue into adulthood. To answer this question is critical to the disease prevention argument for children's activity, i.e., those risk factors when young due to inactivity persist in adulthood.

Marshall, et al (1998) looked at the health related fitness components of 414 children over a period of time and found that HRF parameters generally remain the same. Those at risk in elementary school will be at greater risk in school and at high risk in adulthood.

Although PA as an adult is important, so is the activity levels and attitudes and habits found when young.

Marshall, S., Sankin, J, Sallis, J "Tracking of health-related fitness components in youth, ages 9 to 12" MSSE 30(6), June, 98 pp 910-916.

Case for activity while young

There is substantial evidence that participation in activity as an adult often depends upon the attitudinal developments and an individual's past experiences.

Godin, G and RJ Shepard "Use of attitude behaviors models in exercise promotion" Sports Med. 10:103-121, 1990.

There is abundant evidence that the variety of threats to one's health, such as obesity and atherosclerosis begin early in one's childhood and even if one who is sedentary as an adult decides to become active, the individual may have already significant cardio-vascular damage that is difficult to reverse. Such findings reinforce the need for increased physical activity and fitness is essential during childhood.

Sallis, JF, TL Patterson, MJ Boone, PR Nader. "Relation of cardiovascular fitness to cardiovascular risk factors in children and adults". Am J Epidemiology 127:933-941, 1988.

Jeffrey Koplan, director of the CDC in the J Am Med Assoc, Oct 27, 1999 states, "overweight and physical inactivity account for more than 300,000 premature deaths each year in the US, second only to tobacco-related deaths. Obesity is an epidemic and should be taken seriously as an infectious disease epidemic."

Koplan, J. JAMA, Oct 27, 1999 "The spread of obesity in the US"

Koplan also noted that American lifestyle of convenience and inactivity has had a devastating effect on every segment of society... research shows that 60% of overweight 5-10 year olds already have at least one risk factor for heart disease, including hyperlipidemia, and elevated blood pressure or insulin levels.

According to Powell and Blair, quantitative estimates indicate that sedentary living and inactivity is responsible for about 1/3 of deaths due to CHD, colon cancer and type II diabetes.

KE Powell and SN Blair. The public health burdens of secondary living habits: theoretical but realistic estimates. MSSE 26:851-856, 1994.

ANOTHER INTRO

WHO had defined health as "a state of complete physical, mental and social well-being not merely the absence of disease or infirmity." WHO, 1948.

While WHO had defined health in broad terms, health in the US has typically been measured narrowly and in a negative sense. CDC Measuring Health Days

Usually what is measured is ill-health and measures taken at hospitals and clinics or the lowest level of health. Often these factors measured in hospitals and clinics reveal little about the health of the nation or community. In the 1980's the search began to look at non-traditional parameters or quality of life parameters. CDC notes "As medical and public health advances led to cures and better treatments of existing diseases and delayed mortality, it seemed logical that those who measure health outcomes would begin to assess the population's health not only on the basis of saving lives, but also in terms of improving them." Pg 5

