



136
441
THS

PREPARTICIPATION ATHLETIC EXAMINATION
STANDARDS DEVELOPED FOR THE GENESEE COUNTY
INNOVATIONS IN PRIMARY CARE EDUCATION

Scholarly Project for the Degree of M. S. N.
MICHIGAN STATE UNIVERSITY
PEGGY ANN PRUCHNICKI
1998

LIBRARY
Michigan State
University

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.
MAY BE RECALLED with earlier due date if requested.

DATE DUE	DATE DUE	DATE DUE

**PREPARTICIPATION ATHLETIC EXAMINATION STANDARDS
DEVELOPED FOR THE GENESEE COUNTY INNOVATIONS IN
PRIMARY CARE EDUCATION**

By

Peggy Ann Pruchnicki

A SCHOLARLY PROJECT

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER IN NURSING

College of Nursing

1998

ABSTRACT
PREPARTICIPATION ATHLETIC EXAMINATION STANDARDS
DEVELOPED FOR THE GENESEE COUNTY INNOVATIONS IN PRIMARY CARE
EDUCATION

By
Peggy Ann Pruchnicki

There is a wide variety of guidelines available used to teach and perform the preparticipation athletic examination (PAE). It was the goal of this project to begin the process of incorporating a health risk assessment of the adolescent athlete during the preparticipation athletic examination. This project developed standards to be presented to the Genesee County Innovations in Primary Care Education Standards Implementation Committee. These standards were developed by literature review of nationally and locally accepted standards. They include a risk assessment of the adolescent athlete. The standards will ensure that the preparticipation athletic examination is taught to health care professionals and performed to optimize this encounter with the adolescence athlete. The preparticipation athletic examination is an ideal opportunity to improve the health of the adolescent athlete.

**This project is lovingly dedicated to my family for their never ending support, love and
patience . Without them, none of this would have been possible .**

Thanks Joe, Becky, Katie, Mike and Kendra with Love.

ACKNOWLEDGMENTS

I would like to thank the members of my committee for providing me the assistance I needed to complete this project while understanding my time constraints . I would especially like to thank Linda Spence, R.N., Ph.D. for her guidance and patience, Patty Peek, RN, M.S.N. for the generosity of her time and giving me this opportunity. Lyn Behnke, RN, M.S.N. for her support and life saving encouragement. Thanks to David Minger for his computer expertise and Diane Banyas for the last minute changes.

TABLE OF CONTENTS

DEDICATION.....	iii
ACKNOWLEDGEMENTS	iv
LIST OF TABLE.....	v
INTRODUCION.....	1
PURPOSE	3
CONCEPTUAL FRAMEWORK.....	3
LITERATURE REVIEW.....	8
PROJECT DEVELOPMENT	13
IMPLEMENTATION	14
STANDARDS	15
IMPLICATIONS FOR PRACTICE	21
IMPLICATIONS FOR EDUCATION.....	23
IMPLICATIONS FOR RESEARCH	23

APPEDICES

Appendix A.....	Comparisons
Appendix B.....	Standards
Appendix C.....	History/Risk Form
Appendix D.....	Medical Conditions
Appendix E.....	Physical Form
Appendix F.....	Classification of Sports
Appendix G.....	Medical Conditions
Appendix H.....	Clearance Form

Preparticipation Athletic Examination Standards Developed for the Genesee County Innovations in Primary Care Education

Introduction

Historically the purpose of the Preparticipation Athletic Examination (PAE) has been to ensure the safety of the athlete. The PAE has been envisioned as a focused health assessment designed to detect conditions that may compromise the athlete's ability to compete safely and effectively. Specifically, the PAE was designed to focus on identifying those athletes at risk for injury or sudden death or those with an underlying medical condition that may affect participation. Of the 22% to 39% of high school athletes who sustain a significant injury as many as 20% of such injuries may have been preventable (Krowchuk, 1997). It is generally believed that the PAE serves as a useful tool in the detection and prevention of unnecessary injuries and illnesses in athletes if performed correctly.

The PAE could also serve as a tool to ensure the safety of the adolescent athlete by assessing for high-risk behaviors that could interfere with the athlete's health. This could be an excellent opportunity to assess adolescents about health care behaviors. The Council on Scientific Affairs (1993) points out that adolescents as a group are heavily involved in health risk behaviors, and 14% of adolescents lack financial access to medical care. The Council on Scientific Affairs (1993) also states that the PAE provides a convenient opportunity to include in the health history form, a health risk assessment. This assessment should determine attitudes toward and the use of illegal and ergogenic drugs as well as the use of alcohol and tobacco. All adolescent athletes should be provided with information about health hazards associated with the use of drugs, alcohol, tobacco, ergogenic agents, excessive measures to control weight, sexually transmittable diseases, and unwanted pregnancies. Nurse practitioner students and medical residents are learning advanced skills in regard to this type of assessment and educational process. This project will develop the standards to be utilized by the Genesee County Innovations in

Primary Care Education for preparticipation athletic examination.

Presently the typical PAE accounts for the high school athlete's primary contact with health care professionals (Krowchuk, Krowchuk, and Hunter et. al, 1995).

Guidelines for Adolescent Preventive Services (1994) advise a complete health assessment during early adolescence (age 11 to 14 years), middle adolescence (age 15 to 17 years), and late adolescence (age 18 to 21 years) with an **annual** review of social and behavioral risk factors. The purpose of the typical PAE has traditionally been to ensure the safety of the athlete. The PAE needs to be revised and standardized to ensure that more comprehensive criteria are used and that the goals, content, and objectives remain clear and are met. As clinicians, we must be as committed to meeting the comprehensive health care needs of adolescent athletes as we are to clearing them for competition.

A Nurse Practitioner is well suited to participate in the development of criteria for the PAE. The focus needs to be placed on that which will best benefit the adolescent. Findings from the National Longitudinal Study on Adolescent Health (1997) indicated that 3 of every 4 deaths in the second decade of life are caused by social morbidity: unintentional injuries, homicides, and suicides. Juvenile homicide rates have continued to escalate until recently, and suicide rates among adolescents aged 14 years or younger have increased by 75% over the past decade. Cigarette smoking among teenagers has increased by as much as 2% per year since 1992, when 19% of high school seniors reported smoking. Marijuana use has increased in each of the last 3 years among 8th-, 10th-, and 12th-grade students (Johnston, O'Malley, et. al.1989). This project will begin to change the focus of the PAE so that it will have the greatest impact on health promotion in the adolescent population.

Adolescents tend to view the typical PAE as a routine yearly physical examination (Krowchuk, Krowchuk, and Hunter et. al, 1995). Although convenient, this practice bypasses important health care priorities for teenagers. The psychosocial-medical needs of adolescent athletes are similar to those of their peers. Adolescents who participate in

sports may engage in substance use and other health-compromising behaviors.

Typical Health Risk Behaviors

Adolescent athletes may use alcohol and other drugs for three reasons: (1) they experiment with alcohol and other drugs as part of the larger youth culture. (2) They use ergogenic agents (commonly known as anabolic steroids) to enhance their athletic performance. (3) They use diuretic agents, emetic agents, or other excessive mechanisms to control weight (Council on Scientific Affairs, 1993). As mentioned, tobacco, marijuana, and other illicit drug use continues to rise. Each year, more than one million girls become pregnant and adolescents have the highest rates of chlamydial cervicitis, other sexually transmitted diseases and hospitalizations for PID (Royce, C. 1995). The incidence of anorexia nervosa and pathogenic bodyweight control measure are beginning to be studied, as the incidence seems to be rising and the outcome fatal. This is why the PAE is the appropriate time to investigate involvement in health-risk behaviors and to provide adolescent health information. Questioning and counseling athletes regarding health-risk behaviors such as alcohol, tobacco and illicit drug use, sexually transmissible diseases and unwanted pregnancies, pathogenic bodyweight control behaviors and the use of ergogenic aids for performance enhancement are crucial during this time of intense social, psychological, and physical development.

Adolescent participation in athletics has been shown to increase the adolescent's self-image along with physical condition, social growth, and development. An estimated 3.3 million boys and 1.8 million girls participate in interscholastic athletics (American Medical Association, 1993). Physicians, nurse practitioners (NP), and medical residents are being increasingly called upon to perform or be a part of the process that provides the preparticipation athletic exam (PAE). The PAE needs to ensure that the adolescent athlete is provided with the assessment and education that will impact the most on their health. Since eighty to ninety percent of adolescents utilize the PAE for a routine physical examination, more emphasis must be placed on risk assessment. This is an excellent

opportunity to assess and educate the adolescent on health risk behaviors.

Purpose

The purpose of this project is to present the Genesee County Innovations in Primary Care Education (GICP) with a recommendation of standards to be utilized to educate the student health care providers. These standards will strive to ensure and maintain the health and safety of young athletes in a safe, efficient, and effective manner. These recommendations were based on a review of the literature to identify and compare national and local standards of care as well as a review and evaluation of evidence based standards and guidelines presently in use for the PAE.

Definitions

For the purpose of this scholarly project the following definitions will be used:

1. **Student Athlete:** a child enrolled in a middle/high school educational institution that participates in a school-sponsored team
2. **Preparticipation Athletic Examination (PAE):** examination that includes a history, physical examination and health risk assessment performed once yearly before the participation in a school sponsored athletic activity.
3. **Injury:** any incident resulting from athletic participation that keeps an athlete from completing, a practice or game, or causes the athlete to miss a subsequent practice or game (Smith, Lombardo, and Robinson, 1991).

Conceptual Framework

Health promotion addresses individual lifestyle and personal choices which may impact one's own health. These choices include physical activity, nutrition, smoking, alcohol, other drugs, and sexual activity. Health protection is directed toward decreasing the probability of experiencing health problems by active protection against pathologic stressors or detection of health problems in the symptom free stage. Health protection focuses on efforts to move away from or avoid the states of illness or injury (Pender 1987).

The Health Promotion Model (HPM), originally appeared in nursing literature in the 1980's and has gone on to be revised. The most recent version (figure 1), is the one utilized for this project and is applicable to any health behavior in which "threat" is not proposed as a major source of motivation for the behavior. Since the HPM does not rely on "personal threat" as a main source of health motivation, it is a model that can be utilized for any age group. This is especially useful in the adolescent population who perceive themselves as invulnerable to illness or injury.

The HPM tries to determine why individuals make the choices that they do. The model relies on the expectancy-value theory and the social cognitive theory for the basis of its framework. Each person has unique personal characteristics and experiences that affect subsequent actions. The importance of their effect will depend on the target behavior being considered. The aspects of prior behavior or individual characteristics selected for measurement provide flexibility in the HPM to utilize variables that may be highly relevant to a particular health behavior but not to all health behaviors or in the adolescent population and not other populations.

The person is the individual and the focus of the model. Each person is uniquely expressed by his or her own pattern of cognitive-perceptual and modifying factors. The cognitive-perceptual factors are usually defined as the "primary motivational mechanisms" (Pender, 1987). These mechanisms are neither driven by inner forces nor automatically controlled by external stimuli.

Behavior is explained by a combination of influences in which behavior, cognition, other personal factors, and environmental events all operate as interacting factors with each other. Those that the adolescent might possess could include the activity-related affect, interpersonal influences, situational influences, perceived self-efficacy, definition of health, perceived benefits of behavior, and perceived barriers to health-promoting behaviors.

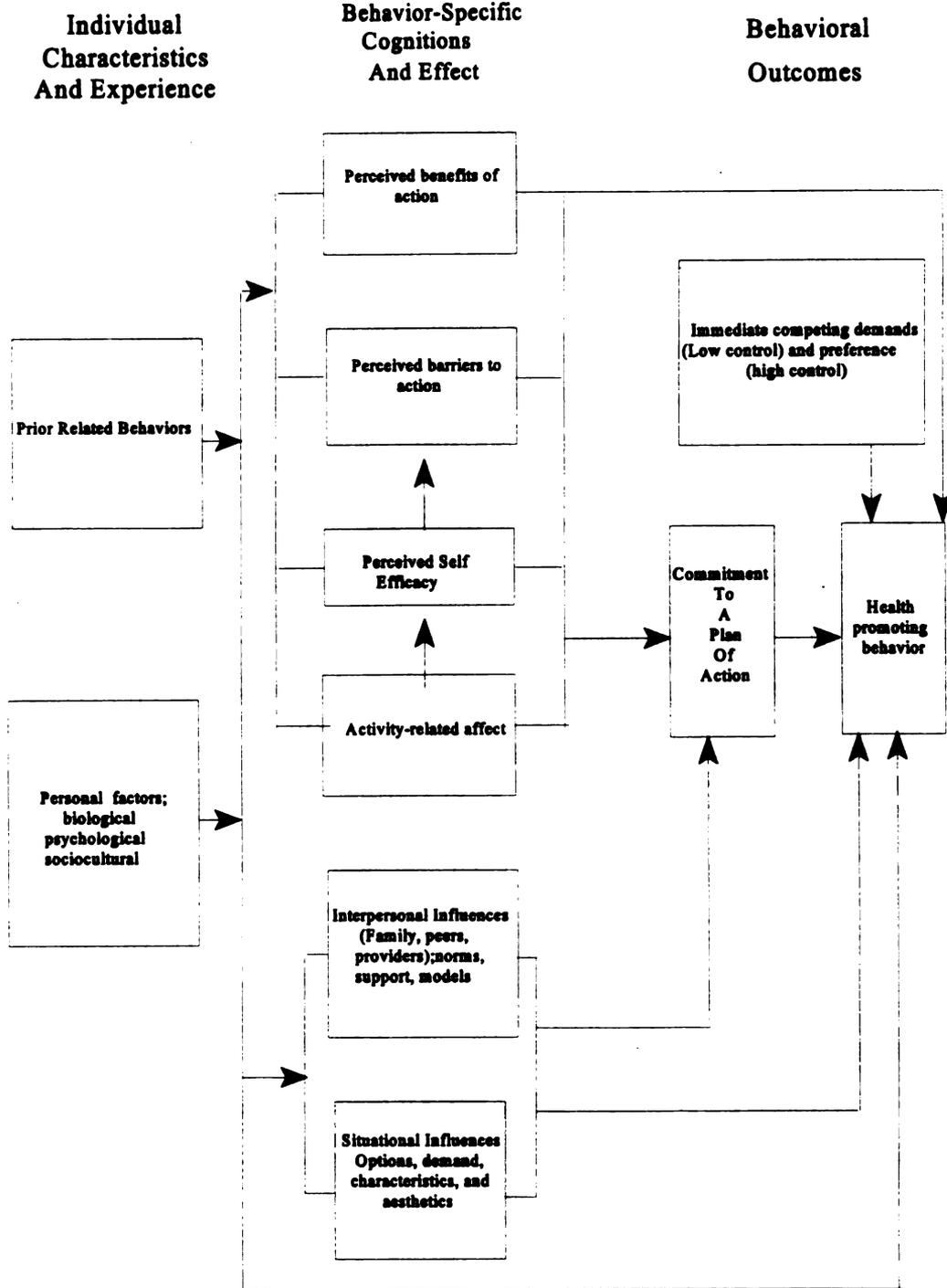


Figure 1. Revised Health Promotion Model (Pender, N. 1996)

Self – efficacy is a judgment of one’s ability to accomplish a certain level of performance in accomplishing a specific behavior. Self-efficacy should be considered an important concept for manipulation in health protection and health promotion interventions for the adolescent. The interaction of self-efficacy with other predictors of health behaviors needs to be explored further to understand the motivational dynamics underlying health behavior. Sources of self-efficacy include performance attainments (high ability of experiences), vicarious experiences (observing the behavior of others), verbal persuasion (being convinced by others of capabilities), and physiologic states (aversive arousal: stress and anxiety, fatigue, or pain). Modifying factors will include such things as age, gender, education, body weight and family patterns.

The HPM is useful in looking at the adolescent and incorporating the PAE into its organizational framework. The HPM will help to explain and predict health behaviors. Adolescence is one of the developmental periods in which social and cognitive skills for autonomous decision making and responsible self-care are developed. (Figure two)

Approaches to enhancing self-care behaviors of adolescents need to focus on the effects of peer groups; prior related behaviors, and personal factors. It is important to reinforce autonomous decisions and make them more responsible for self-care. This approach is critical, since values, attitudes, beliefs, and behaviors of peers influence the adolescents’ lifestyles. The rapid developmental changes that occur for adolescents and the emerging yet malleable behavioral patterns that will carry into adulthood make the PAE an ideal time to assess and enhance self-care skills for prevention and health-promoting behaviors.

The PAE would fall in with the theory of health promotion and health protection if performed correctly and the goals and objectives are fulfilled. The PAE would provide the opportunity for the health care provider to educate the client on health promotion and health protection. Health promotion is the desire to increase well being and to reach optimal health potential. Health protection is to actively avoid illness or injury, detect it

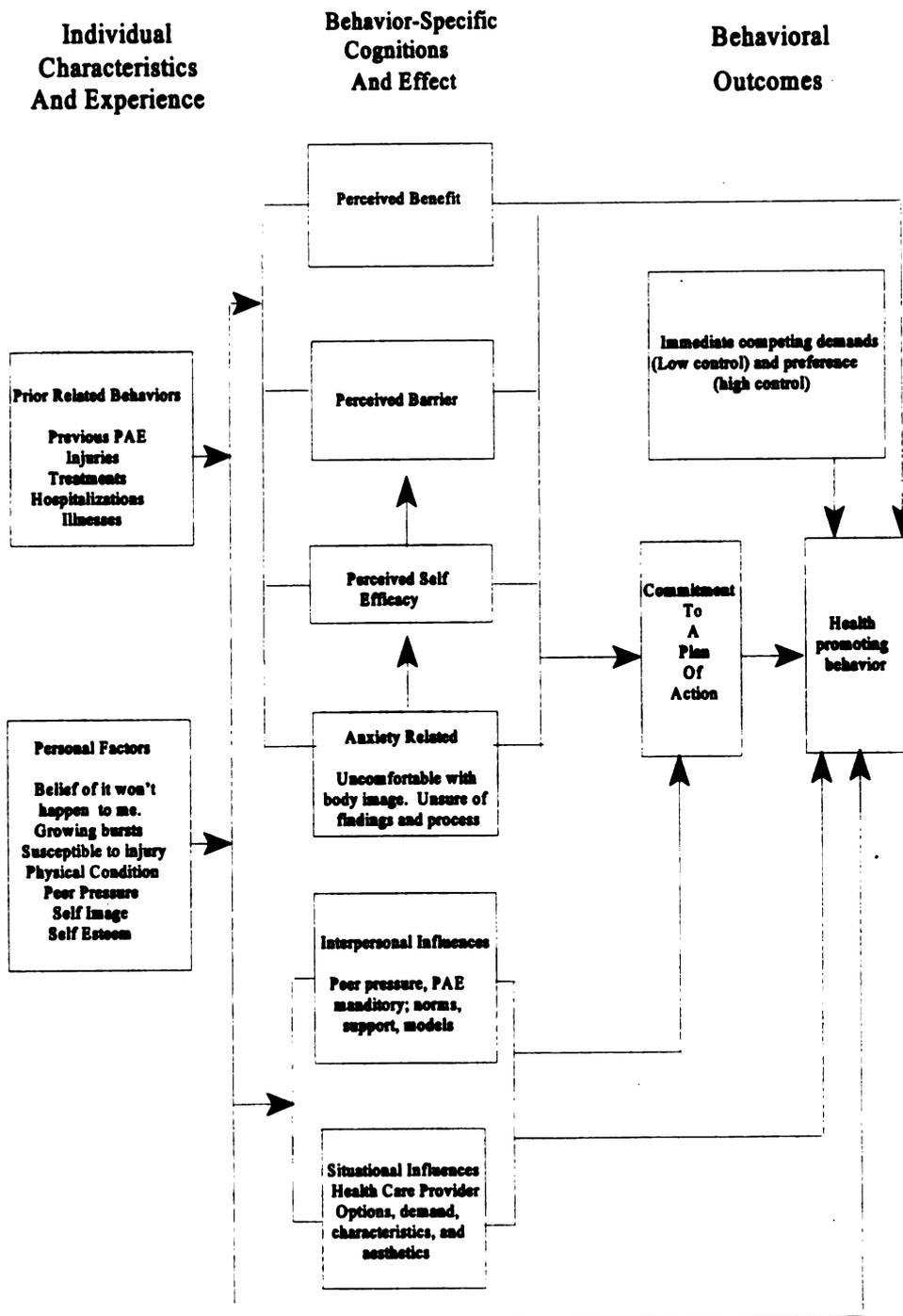


Figure 2. Revised Health Promotion Model: Adolescent Athlete

early, or maintain optimal health. Health promotion and health protection are complimentary processes and essential for improving the healthy life span for all Americans. The PAE is in a position to begin to provide an introduction to this process to the student-athlete even though it was not originally designed to do so.

Student-athletes engage in activities not for health promotion but for the pure pleasure of doing so, for peer acceptance, or for the improvement of physical appearance and attractiveness to others. This model is useful because it addresses the theory of the motivating behavior based on components other than the avoidance of illness.

Literature Review

Increasing numbers of adolescents are becoming involved in sports activities. For many of the adolescents the preparticipation athletic examinations is the first interaction with a health care provider since their preschool visit at age 5. Thus, through the PAE, health providers have an opportunity to evaluate and counsel a large segment of the population who may not have sought medical care had it not been required. This section will review the history, effectiveness and timing of the PAE.

Historical Purpose of the PAE

The common theme of the literature reviewed is that the PAE has a definite purpose. The primary purpose is for screening adolescents for potential risk of injury and preventing those injuries if possible. Pediatricians, sports medicine physicians, nurse practitioners, cardiologists and orthopedic doctors all state that the PAE can screen for some types of potential harm to the athlete at risk (Bratton, 1995; Gemberling, 1996; Rice, 1994; Smith, 1994; Smith, Lombardo et al., 1991; Tanner, 1994;). The goals and objectives of the PAE are to enhance and maintain the health and safety of students participating in organized athletics.

Historically the PAE has been defined as fulfilling the following objectives. The first objective is to detect any condition that may limit a student athlete's participation. This includes any medical conditions that might contraindicate participation in certain

activities (e.g., heart murmur consistent with hypertrophic cardiomyopathy) (Bratton, 1995; Gemberling, 1996; Rice, 1994; Smith, 1994; Smith, Lombardo et al., 1991; Tanner, 1994;). The second objective is to detect any condition that predisposes a student-athlete to injury during competition. This includes past or present injury/illness, congenital or developmental anomalies, a lack of general wellness (e.g., an obese student-athlete may be at increased risk for heat-related illness), or a student-athlete with a musculoskeletal injury that has not been adequately rehabilitated (Bratton, 1995; Gemberling, 1996; Rice, 1994; Smith, 1994; Smith, Lombardo et al., 1991; Tanner, 1994;).

The third objective is to meet legal or insurance requirements. Approximately 35 of 45 states responding to a survey reported that PAEs are required of all students prior to athletic participation (Bratton, 1995; Gemberling, 1996; Rice, 1994; Smith, 1994; Smith, Lombardo et al., 1991; Tanner, 1994;). The Michigan High School Athletic Association requires that all students participating in interscholastic activities complete a PAE prior to participation.

Discovery of a new medical condition during a PAE is rare. One study showed that of more than 2,700 male adolescents examined, 9.2% were given a medical diagnosis, and only 1.2 had a condition that precluded immediate sports participation (Bratton, 1995). In another study conducted over 5 years in 10,540 athletes, 89.4% passed a preparticipation evaluation; 10.2 were given a medical diagnosis but passed, and only 0.4 were not allowed to compete (Nichols, 1995). Nevertheless, a potentially life-threatening condition may be uncovered by comprehensive evaluation. Thorough history taking alone can identify limiting conditions in up to 74% of cases (American Medical Association, 1994).

PAE and Sudden Death in Athletes

In contrast to the high mortality associated with accidents, homicide, and suicide, death associated with athletic participation is a rare event. It is estimated that 1 in 200,000 competitive athletes or 35 of the 7 million adolescent participating in organized

sports, are at risk for sudden death (Epstein, 1986). Such an occurrence is usually cardiac in origin and typically preceded by little or no warning. Difficulty in diagnosis is compounded by the poor correlation between physical fitness of the athlete and the underlying condition of the heart. Any signs or symptoms, which may be detected on the sports-oriented exam, are equally recognizable during the standard history and physical. Thus, the typical sports physical not only fails to address the most common causes of sudden death in adolescents, but it also offers no advantage for detecting teenagers at risk for sudden death during exercise.

PAE and Athletic Injuries

Evidence that abnormal findings on the PAE predict an increased risk of athletic injury is inconsistent. Garrick and Smith (1990) observed that the screening has not helped detect athletes who merit disqualification. While comprehensive physical examinations, multi-station examinations, and laboratory tests do discover a number of abnormalities, the vast majority of these abnormalities prove to be false-positive findings. Consequently, in the healthy population of young athletes, the disqualification rates in multiple studies have averaged only 0.3% to 1.3% of all the students screened (Dyment, 1986). Goldberg et al (1980) reported that 15% of the 701 student athletes evaluated during a pre-participation examination study had medical problems that warranted further evaluation or exclusion from sport participation. Among them, 9 students were prohibited from participation because of medical or orthopedic problems.

Studies have reported that increased joint flexibility, ligaments laxity, and previous injuries were associated with increased sprains, dislocations, and reinjuries (Krowchuk, 1997). These studies suggested that a standardized PAE might be able to detect adolescent athletes at increased risk of sports-related injuries, however no prior research has specifically addressed this. The studies indicated that the items on the health history portion of the PAE were more predictive of athletic injuries than were findings from the physical examination (Fields and Delaney, 1990). The most frequently injured

body areas were the knee, ankle, leg, arm and shoulder, each of these injuries was associated with findings on the health history. Specifically, previous injuries or having undergone surgery on a particular body area were associated with injuries during the subsequent sports season. However, as was found with the physical examination portion of the PAE, the associations between findings from the health history and actual injuries were weak and the sensitivities and positive predictive values were low.

Previous studies also support the finding that athletes who report previous injuries are at higher risk of reinjury during athletic competition. The proposed PAE can be used as a screening test for previously undetected risk of injury or disease. As such, some believe that it fulfills the widely accepted criteria for a screening test for large populations: specifically since it is relatively inexpensive, rapid and noninvasive.

Timing of the PAE

Recommendations on when to perform the preparticipation examination vary from several days to several months before the initiation of the sport. The majority of physicians believe the optimal time is 4-6 weeks prior to the first sport of the school year that the adolescent participates in. This allows adequate time for any further diagnostic testing that may be required to clarify findings or answer questions.

The PAE as a Health Assessment

The American Medical Association (1993), based on articles by Risser (1985) and Schichor (1988) concluded that administration of the PAE is an appropriate time to investigate involvement in health-risk behaviors and to provide adolescents with health information. Garrick and Smith (1990) believe that it is inappropriate to look at the PAE as the total health care of the adolescent athlete. They felt that the PAE should be brief with half a dozen historical questions and a brief physical exam.

In many instances, however, the sports physical is the only medical evaluation these teenagers receive for several years. As documented by Goldberg, Saraniti, Witman, (1980), the typical preparticipation screening exam served as the annual health assessment

for 78% of the 701 high school students surveyed. Although convenient, this common practice circumvents the policies for adolescent preventive services, which have been outlined by the American Medical Association and the American Academy of Pediatrics. The most recent guidelines advise **annual** routine health assessments for individuals aged 11 to 21 years. Suggested components of these evaluations include:

1. **Anticipatory guidance** in the areas of injury prevention, nutrition, physical activity, sexuality, and substance use.
2. **Health Risk Screening** for chronic diseases such as hypertension, tuberculosis, or hyperlipidemia, and for problems in the areas of substance use, sexuality, sexually transmitted diseases, school performance, mental health, or physical or sexual abuse.
3. **The provision of immunizations** (Krowchuk, Krowchuk and Hunter, 1995).

The typical PAE also bypasses important health care priorities from the teenagers' point of view as well as from the parents' perspective. Krowchuk, Krowchuk, Hunter, (1995) found that thirty percent of the parents in their survey planned to use the PAE as their student athlete's only contact with a health care provider. Parents whose adolescent's health insurance provided for comprehensive health assessments were more likely than those without this benefit to plan a comprehensive health care evaluation (75% vs 60% respectively). In addition to addressing problems that might affect sports participation, parents thought that the PAE visit should evaluate medical problems that are unrelated to athletics, perform health screening procedures, assess social or behavioral issues, and provide immunizations.

Conclusions

Despite its numerous shortcomings, the PAE is a potentially important aspect of adolescent health care. As a "captive population," student athletes are in a unique position to receive optimal medical supervision. Guidelines can be initiated in an effort to help raise student athletes from the ranks of medically underserved to those that are able to

receive adequate health care. As clinicians, we must be as committed to meeting the comprehensive health care needs of young adult athletes as we are to clearing them for competition.

The reasons for addressing these issues are compelling and urgent. Each year there are 15,000 to 18,000 adolescent deaths in the United States from automobile-related injuries (Kempe, Silver and O'Brien 1987). Alcohol and other drugs are factors in many of these fatalities. There are approximately 6,000 young adult homicide victims annually (National Center for Health Statistics, 1993). The rate of suicide in this age group has risen dramatically over the past three decades to 5,000 per year (National Center for Health Statistics, 1993). It is estimated that there are 50 to 200 attempts for every death (Cohen, 1984). One million pregnancies per year occur among American women 19 years of age or younger with approximately 500,000 live births, 400,000 elective terminations, and 100,000 spontaneous abortions (Hardy, 1988). In addition, up to 6 million cases of sexually transmitted diseases are reported among adolescents yearly in this country (Shafer, 1994). Teenagers also account for nearly 50% of reported cases of abused children (Rosen, 1990).

Project Development

It was the goal of this project is to develop evidenced based standards of care to be utilized to administer an enhanced PAE. These standards will be taught to health care provider students involved in the Genesee County Innovations in Primary Care Education grant. The standards are user friendly so they can be utilized in the primary care setting where the provider must see a new patient every 20-30 minutes. The enhanced PAE includes past medical history with a risk factor assessment, relevant family history, and a physical exam. The PAE is optimized to assess and educate the adolescent athlete by incorporating a health risk assessment in the health history form.

This project brings together nationally recommended standards of practice by incorporating recommendations from preparticipation sports literature. The publication of

the educational monograph, **Preparticipation Physical Evaluation**, endorsed by 5 major organizations in the United States (American Academy of Family Physicians, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine and American Osteopathic Academy of Sports Medicine) will be the foundation for the development of these standards. This monograph is a product of a representatives of these organizations and provide standards that were identified and utilized y the majority of the literature reviewed. These standards are nationally recognized and are research based.

It is uncommon to hear of tragic or serious injuries occurring in young athletes during competition or practice. The main threats to adolescents' health are the risk behaviors they choose. Yet the controversy remains of what should be included in a PAE. Much has been written on the subject by authorities in various disciplines with widely conflicting opinions. The PAE is an opportune time to perform a health screening on a high-risk population group. In the arena of managed care this opportunity needs to be optimized for the health of the adolescent population.

The recommended standards are outlined and compared to other published standards for presentation to the Genesee County Innovations in Primary Care Education Council. (Appendix A) This will allow the council to compare the different theories. Recommended health history forms will be compared and evaluated to determine if the necessary areas are addressed.

Implementation

The PAE standards will be presented to the GCIPCE. The standards chosen were based on the monograph developed by the consortium of participants from the American Academy of Family Physicians, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine and American Osteopathic Academy of Sports Medicine. This monograph was based on research and nationally recognized standards. The health risk assessment questions are

based on identified areas of health risk concerns for adolescents that effect their morbidity and mortality.

The GCIPE is designed to reorient physician and nurse practitioner training in providing comprehensive ambulatory primary care. The goals of the GCIPE include strengthening the knowledge of trainees regarding preventive care. Nationally accepted uniform guidelines for the typical PAE have been nonexistent despite multiple recommendation and requirements. This scholarly project will recommend standards and guidelines to be taught to health care professional students in the GCIPE program in regards to an enhanced PAE. The recommendations will be presented to the Standards Committee. The committee will have an opportunity to suggest any revisions that may be needed and then send it to the Implementation Committee.

The GCIPE has a Curriculum Committee that will develop the curriculum guidelines that will be utilized to ensure the PAE goals are taught. It is the suggestion of this project that it is vital that the health care providers understand the importance of reviewing and validating the health risk assessment questions with the adolescent athlete in private. Areas to be expanded on include the area of being a victim of violence, this should include a question of has the athlete ever been physically, emotionally, verbally or sexually abused.

The Standards

Health History and Risk Factor Assessment

An adequate medical history and risk factor assessment may be obtained by using a standardized questionnaire. (Appendix C) It should be self-administered, easy to understand and limited to one side of the paper. The questionnaire should be given out well in advance of the PAE so the adolescent athlete and his or her parent(s) have adequate time to complete it. Parental input is important to the accuracy of an athlete's medical history; Risser and associates found that when history forms were completed separately by athletes and their parents, only 39% of the forms matched. During the PAE

the practitioner should review the risk assessment in a private interview with the athlete to allow confidentiality and encourage truthful responses about any sensitive subject. This should include subjects such as the health risk behaviors of suicidal thoughts, alcohol, illicit drugs, cigarette use and sexual activity.

The following are important aspects of the history that should not be overlooked. Certain responses in these areas may alert the health care provider to preexisting conditions or risks that may exclude the athlete from competition and necessitate further evaluation:

Cardiovascular questions need to probe for symptoms suggestive of congenital cardiac anomalies, including hypertrophic cardiomyopathy, which is associated with the most common cause of sudden death in young athletes. Because there may be a genetic component to this condition, it is important to look for a family history of young or middle-aged sudden death or a history of a myocardial infarction before the age of 50. Dizziness or syncope during exercise, as well as a history of arrhythmia's or palpitations, chest pain, Marfan's syndrome, congenital anomalies of the coronary arteries,, or a prolonged QT syndrome may warrant a more thorough evaluation by a specialist (Lombardo, 1991). Structural cardiovascular abnormalities are responsible for the common causes of sudden cardiac death in adolescent athletes. The rarity of exercise-related deaths limits the yield of any screening procedures. Positive results from screening examinations are often not predictive of subsequent cardiac complications because cardiac "abnormalities" in young athletes are often variants of normal (Lombardo, 1991).

Exercise-induced asthma (EIA) is the most common pulmonary problem encountered in the adolescent athlete. A family history of respiratory problems, especially if present in both parents, and a history of persistent coughing with and after exercise should raise the evaluator's suspicion that EIA may be the problem. In most cases, this can be well controlled with metered dose inhalers, which will allow the adolescent athlete to participate fully.

A history of **seizures** that are well controlled need not limit a young athlete from all types of physical activities. Careful attention should be paid to level of control and drug side effects, and an evaluation made of the impact a seizure would have on the athlete and his team members' safety. A prior history of concussion, especially one where all the symptoms have not resolved completely, should alert the evaluator to the need for a more careful analysis of the situation. The so-called "second impact catastrophic head injury syndrome" accounts for a number of fatalities in contact and collision sports (Fields, 1994).

Confidential matter such as drug use, psychological problems, dysfunctional family life, depression or suicidal thoughts are a few of the areas that are important to address as indicated. Other common areas of concern include sexuality, menstrual problems, obesity or body image disturbances, acne or other skin infections.

An exploration of **past medical history** would not be complete with out an evaluation of prior and current medical conditions or disorders. Chronic medical disorders, such as diabetes or hypertension, need to be evaluated and monitored and certain restrictions may be necessary if control is poor. An athlete who lacks one of a paired organ may not necessarily be disqualified from participation. If an athlete has only one eye, testicle, or kidney, contact sports may be discouraged and/or protective equipment may be worn to safeguard the remaining organ. (Appendix D) Knowing what medications are being taken, including aspirin, past surgical procedures or hospitalizations, immunization status, and history of allergies, are helpful data to have if an urgent or emergent problem needs prompt treatment.

Orthopedic injuries are the most common reason for disqualification from sports participation, and unstable knees rank as the most common of these (American Medical Association, 1994). Athletes with a prior history of musculoskeletal injury, including fractures, sprains/strains, dislocated joints, repeated swelling or other injuries to bones or joints, including ligaments damage should be further questioned as to how or if there was

any rehabilitation. Many athletes return to play without further medical evaluation or clearance and before there has been a complete return of function from the previous trauma. Before returning to participation there should be a return to full range of motion, no muscle atrophy, no swelling and normal strength.

The form that is recommended is the form developed in the publication of the educational monograph, *Preparticipation Physical Evaluation*, (American Academy of Family Physicians, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine and American Osteopathic Academy of Sports Medicine, 1997). (Appendix C) This form incorporates the areas addressed by several of authors (Bratton, 1995; Gemberling, 1996; Rice, 1994; Smith, 1994; Smith, Lombardo et al, 1991; Tanner, 1994).

Physical Examination

The physical examination is a careful assessment of the following areas as noted in most of the resources examined (Appendix E).

Vital signs, with particular attention to the accurate measurement and interpretation of the blood pressure, are a vital part of the PAE. Blood pressure measurements greater than 130/80 merit repeating during the season. A general guideline is that pressures greater than 125/75 for athletes less than 10 years of age and 135/80 for those over 10 years of age need further evaluation. Height and weight are helpful indicators of under and overnutrition. A resting pulse rate and rhythm may be indicators of the athletic heart or be the first clue that an arrhythmia exists. Respiratory rate elevations might be seen in cases of significant pulmonary disease.

Visual acuity should be measured using the Snellen eye chart. Best corrected vision of 20/50 or better should be a prerequisite before participation begins. Infrequently, anisocoria (unequal pupil size) will be identified as physiological variant. Awareness of this important baseline finding in an athlete with a head injury may be imperative.

A cardiovascular system evaluation focuses primarily on the detection of

pathological murmurs. Any diastolic murmur warrants further evaluation. The systolic murmur of hypertrophic cardiomyopathy increases in intensity when the athlete goes from a lying to a standing position (Lombardo et al, 1991). Two commonly missed conditions include the atrial septal defect which presents with a systolic ejection murmur and a fixed split of the second sound, and the patent ductus arteriosus with its classical “machinery” murmur, which can be heard throughout systole and diastole. Uncommonly, an irregular heart beat, not associated with respiration, may be indicative of a premature ventricular contraction. Athletes with ectopic beats should be questioned about a recent viral infection because viral myocarditis may cause death during subsequent athletic participation (Lombardo et al, 1991). Any arrhythmia found on physical examination requires electrocardiograph evaluation to identify the type of arrhythmia and whether structural heart disease exists. Consultation and referral may be necessary to fully evaluate the cause of the disorder.

The **musculoskeletal exam** is another critical area of the examination. Studies report that approximately 50% of athletic disqualification’s are caused by knee instability (Fields, 1994). The examination should consist of musculoskeletal alignment and flexibility evaluation. Abnormalities and sequelae of previous injury may be seen. Observation of muscle atrophy or significant joint malalignment is important, because these can play a role in less serious knee problems like patellofemoral stress syndrome (Fields, 1994).

The other two commonly injured joints are the ankle and the shoulder. If ankle laxity is discovered, functional testing should be performed. Athletes involved with overhand throwing and swimmers often have impingement syndrome, which can include bursitis and rotator cuff tendinitis. Careful evaluation should be performed to rule out any instability, subluxation or apprehension. Abnormal findings of the ankle or shoulder require orthopedic evaluation prior to participation.

Other portions of the musculoskeletal examination need evaluation based on

history of trauma or past injury. A careful evaluation of the knee, shoulder, and ankle will generally screen out for most abnormalities. The Two -Minute Orthopedic Examination developed by the American Academy of Pediatrics, Sports Medicine: Health Care for Young Athletes (1991) was adopted for this project. (See Appendix B)

The **abdominal examination** should include an assessment for masses, tenderness, or rigidity. Evidence of an enlarged liver, spleen, or palpable kidney makes the athlete particularly vulnerable to rupture in contact sports. A search for the cause should follow, as these may be associated with conditions such as mononucleosis, lymphomas, polycystic kidneys, hydronephrosis, or metastatic cancers. Inguinal hernias are frequently found on exam and do not represent a reason for disqualification as long as they are asymptomatic and the athlete know what to watch for in cases of incarceration or strangulation.

Examination of the **integument** should include looking for impetigo, molluscum contagiosum, scabies, lice, furuncles or carbuncles, fungal infections, rashes, lesions, or skin cancer. Towels, swimming pools, and mats can serve as a mode of transmission if a lesion is moist and direct or indirect contact takes place with these objects or a fellow athlete.

Additional components of the general exam should be tailored to meet the need of the individual athlete, based upon significant historical data revealed and adequacy of additional care available to athletes examined. The American Academy of Pediatrics, Committee on Sports Medicine, (AAP) has developed a set of Recommendations for Participation in Competitive Sports, (Appendix F). The AAP has established participation guidelines that may be used in deciding to clear an athlete for a particular sport. The health providers judgement is essential in applying these recommendations to a specific patient, and alternative activities or treatment should be suggested when possible. This resource is invaluable for those health care providers who are involved with the PAE and are making the subsequent determination of student-athletes prior to participation.

The clearance determination is generally divided into three categories. The first is that the athlete is cleared for all sports, the second is that the athlete is cleared after completing evaluation/rehabilitation for a specific problem, and the third is that the athlete is not cleared for either collision, contact or noncontact sports. In the non-contact category, the athlete may not be cleared for strenuous, moderately strenuous, or non-strenuous activities because of a specific condition or disease process (Appendix G). Contact categories are based on the potential for injury from collision. High-impact contact/collision sports, such as football and ice hockey, have a higher risk of serious injury than noncontact sports, such as golf. Distinctions based on strenuousness are particularly relevant for athletes with cardiovascular or pulmonary disease. Static exercise causes a pressure load, whereas dynamic exercise causes a volume load on the left ventricle. Recommendations can be made to the athlete and his or her parents, and a plan of action can then be instituted.

No matter which type of evaluation is done-private office or station screening- it is extremely important to ensure complete understanding by the athletes, parents, coaches, and, when necessary school administrators, of any restrictions, necessary work-up and treatment and any alternative activities in which the athlete may participate. To respect confidentiality, however, the health care provider involved in restricting an athlete should obtain authorization from the athlete and parents if the athlete is a minor prior to releasing information to coaches and school administrators.

Using a clearance form separate from the history and physical examination form, (Appendix H), is suggested as a means of providing the parents and school with a copy of clearance decisions and follow-up recommendations while protecting the confidentiality of the athlete's history and physical findings.

Evaluation

There are several ways in which to evaluate the effectiveness of the standards implemented for the PAE. One would be to survey the health care students to determine

if the standards are realistic and user friendly. This could be accomplished by survey. The survey should be done after the health care provider has had adequate time to become familiar with using the PAE standards, approximately 6 months. A time study could also be done to determine how long it takes the health care provider to perform the PAE. Chart review could be done to determine if the standards for the PAE were followed by the health care provider. Another would be to track the adolescents by chart review and determine the different types of health risk behaviors identified, if the interview was done and if education was provided. This information could be helpful in determining the need for educational program.

The adolescent athlete could also be surveyed to determine their satisfaction level with the PAE and if they felt it began to address some of their health care needs. Zimmer-Gembeck et al (1997), reported that of 14,000 adolescents who completed surveys in Oregon, 33% believed they had unmet health care needs. These needs included acne, family planning, dental care, menstrual problems, mental health problems, sexually transmitted disease, and pregnancy.

Implications for Practice

As a provider of primary care the NP has certain goals to maintain. Those goals include services that are integrated and that encompass disease prevention, health promotion, curative and rehabilitative services. As clinicians we should recognize factors that predispose an adolescent to injury. The enhanced PAE can be used to help achieve these goals in the adolescent population. The enhanced PAE can be a point of entry, screening and referral point for the adolescent athlete. It should include information on pubertal development, sexually transmitted diseases, stress and depression, smoking, and substance abuse.

The NP is trained to see individual in a holistic manner. Primary health care providers whether a NP or other professional are in a unique position to make a significant positive impact on the adolescent athlete. Beginning in the initial assessment and

continuing through ongoing contacts with the adolescent, the attitude of the provider is critical. Therapeutic affects can be achieved by remaining respectful toward the adolescent, acting as a consultant to the adolescent, assisting them in educated decisions, maintaining an open and honest attitude and being non-judgmental.

Of the 5.1 million student athletes, the mandatory PAE is the appropriate tool to screen adolescent athletes for their involvement in health risk behaviors. The NP has advanced skill in this area and is a good candidate to be involved with the administration of the PAE. As an assessor, the NP can identify learning needs for specific knowledge and skills required in maintaining health and preventing illness. Counseling the student athlete in relation to their health needs in the physiological, psychological, social and spiritual spheres is an important part of health maintenance. Collaboration may be needed for continuity of care, to rehabilitate an old injury, or to evaluate any abnormal finding.

There is no question that adding the health risk assessment to the PAE will fulfill the role of change agent. This would be an opportunity to improve the health of the adolescent athlete by providing education and counseling.

The NP as a client advocate has definite implications, particularly for the adolescent. This is accomplished by creating an environment for students to take the responsibility for their own health care by making the PAE convenient and confidential. Mutual goal setting when developing the plan of care will also accomplish the goal of this characteristic.

The NP as a counselor in the primary care setting would be demonstrated by promoting self-care activities through health promotion and disease prevention education. Particularly in the area of reproductive health, the NP would be in a position to help the adolescent make informed choices that will make a difference in their decision not to participate in risk taking behaviors.

The other implication is the inclusion of the health risk assessment into the PAE. The students will be given an opportunity to seek advice, voice fear or concern and

receive unbiased correct information about important health care topics. There is much to be said about education regarding the sensitive issues surrounding sexuality coming from a health professional.

Education for the adolescent is important. Although they may have knowledge about their bodies, some of it may be incorrect. It is an appropriate time to teach the adolescent how to do a testicular self-examination and a breast self-examination. Adolescents learn best when they see immediate benefit to themselves. For example, an adolescent with asthma who understands that taking his medicine regularly will permit him to continue playing football is more likely to follow through than if he is told the medication will help him from having an asthma attack.

Adolescents assume more responsibility for their own health and they usually want to be in control. Therefore a problem-solving approach is more likely to be successful with an adolescent than an authoritarian approach. For example, a health care provider teaching an adolescent about the risk of unprotective sex is more likely to succeed by explaining options and consequences than by simply telling the adolescent that he or she must not be sexually active.

The role of the NP as a clinician will be one that is based on advanced clinical judgment based on nursing theories to diagnose and treat primary care problems. Along with the advanced practice theory, there is substantial knowledge of physical and psychosocial assessment to develop a management plan that addresses the health care needs of the adolescent athlete.

One central theme is the partnership between health provider and coaches to improve the health of the adolescent athlete. The advanced practice nurse, as a collaborator will be the essential link to encourage joint responsibility and accountability in developing health services for the athletes. Along with counseling, the NP will also be instrumental in educating the students in the areas of health promotion, health maintenance, and disease prevention.

Implications for Education

There are implications for education. Nursing programs need to begin to address the needs of the adolescent population. It is a population that has been overlooked in past years as the focus has been on the younger generation with the belief that a healthier early beginning translates into healthy adolescents. This is not always the case. The practice of the health care community needs to incorporate the care of the adolescent into the undergraduate and graduate programs. Our future is in the hands of the adolescents today it is the adolescent years where many of the health risk behaviors are experimented with.

The success of this project is dependent on the education of the health care provider students to include a risk factor assessment in the PAE. This will be accomplished by initial training that better prepares the primary care providers to practice comprehensive health care. The health care providers should develop their skills for providing health promotion, education and counseling in their practice. This is a major change from traditional programs and the support to the GCIPCE will be instrumental to help improve the health of the adolescent athlete.

Implication for Research

The NP can ensure that the highest quality health care is being provided to the adolescent athlete by using, participating in and conducting research. Research can be done to determine the best situation in which a PAE can be performed (office visit vs. stations). Another area for future research is to determine what are concerns of the adolescent athlete and if their health care concerns are being addressed. Research should be available to determine the effectiveness of the NP in performing the PAE. The PAE can provide an opportunity to conduct qualitative and quantitative longitudinal studies to measure and assess the health risk behaviors of the adolescent athlete.

Conclusion

As clinicians, we sometimes tend to focus primarily on the physical aspect of the PAE, while ignoring the health-risk behaviors that set the stage for the conditions in

question. However, the challenges for those who care for adolescents extend beyond the office and the PAE. Adolescents today face serious and ever present risks of injury and death. As health care providers of the PAE we have a “bully pulpit” from which to be advocates, educators, initiators and collaborators in the health behaviors for this at risk population.

References

American Medical Association (1995). *Guidelines for Adolescent Preventive Services*. (Ed.), GAPS (2 ed., p.). Chicago, IL: AMA.

American Academy of Pediatrics Committee on Sports Medicine and Fitness. (1994). Medical conditions affecting sports participation. Pediatrics, *94* , 757-760.

Bratton, R. , & Agerter, D. (1995, August). Preparticipation sports examinations efficient risk assessment in children and adolescents. Postgraduate Medicine, *98*, 123-132.

Cohen, M. (1984). The society for behavioral pediatrics: a new portal in rapidly moving boundary. Pediatrics, *73*, 791-798.

Council On Scientific Affairs, American Medical Association (1993, April). Ensuring the health of the adolescent athlete. Archives of Family Medicine, *2*, 446-448.

Dyment, P. (1986). Another look at the sports participation examination of the adolescent athlete. Journal of Adolescent Health Care, (7), 130-132.

Epstein, S., Maron, B. (1986). Sudden death and the competitive athlete: perspectives on preparticipation screening studies. Journal of American Collegiant Cardiology, *7*, 220-230.

Fields, K., & Delaney, M. (1990). Focusing the preparticipation sports examination. The Journal of Family Practice, *30*, 304-312.

Gemberling, C. (1996). Preparticipation sports evaluation: an overview. Nurse Practitioner Forum, *7*(3), 125-135.

Goldberg, B., Saraniti, A., Witman, P., Et Al (1990). Pre-participation sports assessment: An objective evaluation. Pediatrics, *66*, 736-745.

Hardy, J. (1988). Premature sexual activity, pregnancy and sexually transmitted diseases: the pediatrician's role as counselor. Pediatric Review, *10*, 69-76.

Johnson, M., Jay, S., Shoup, B., & Rickert, V (1989). Anabolic steroid use by male adolescents. Pediatrics, (89), 921-924.

Kempe, CH., Silver, HK., O'Brien, D., Fulginiti, V. (1987). Current pediatric diagnosis and treatment. Norwalk, CT: Appleton And Lange.

Krowchuk, D. (1997, January). The preparticipation athletic examination: a closer look. Pediatric Annals, 26, 37-46.

Krowchuk, D., Krowchuk, H., Hunter, M. & Et. Al (1995, June). Parents' knowledge of the purposes and content of preparticipation physical examinations. Archives of Pediatric Adolescent Medicine, 149, 653-657.

Mitchell, J., Haskell, W., Raven, P. (1994). Classification of sports, in 26th Bethesda Conference: Recommendations for determining eligibility for competition in athletes with cardiovascular abnormalities. Medical Science in Sports and Exercise, 26, 242-245.

National Center For Health Statistics (1989). Vital statistics of the United States (2nd ed.). Washington, DC: Public Health Service.

National Longitudinal Study On Adolescent Health (1997). Protecting adolescents from harm. JAMA, 278, 823-832.

Nichols, A., Barton, P., & Kwok, W. (1995). Pre-participation examination: a new form for Hawaii. Hawaii Medical Journal, 54, 434-438.

Pender, N. (1996). Health promotion in nursing practice (3rd ed.). Stamford, Connecticut: Appleton & Lange.

Rice, S. (1994, August). Preparticipation physical examinations: giving an athlete the go-ahead to play. Consultant, 34, 1129-1144.

Rifat, S., Ruffin, M., & Gorenflo, D. (1995). Disqualifying criteria in a preparticipation sports evaluation. The Journal of Family Practice, 41(1), 42-50.

Risser, W., Hoffman, H., Bellah, G., Green, L. (1985). A cost-benefit analysis of preparticipation sports examinations of adolescent athletes. Journal of School Health, 55, 270-273.

Rosen, D., Xiangdong, M., Blum, R. (1990). Adolescent health: current trends and

critical issues. Adolescent Medicine: State Article Review, 1, 15-31.

Roye, C. (1995). Breaking through to the adolescent patient. American Journal of Nursing, 12, 19-23.

Schichor, A. (1989). Sports physicals: are we maximizing our opportunities? Journal of Adolescent Health, 10, 433-434.

Shafer, M. (1994). Sexually transmitted diseases in adolescents: prevention, diagnosis, and treatment in pediatric practice. Adolescent Health Update, American Academy of Pediatrics, 6, 1-7.

Smith, D. (1994, May). Pre-participation physical evaluations development of uniform guidelines. Sports Medicine, 18, 293-300.

Smith, D. , Lambardo, J., & Robinson, J. (1991, December). The preparticipation evaluation. Primary Care, 18, 777-807.

Tanner, S. (1994, April). Preparticipation examination targeted for the female athlete. Clinics in Sports Medicine, 2, 337-353.

Zimmer-Gimbeck, M., Alexander, T., Mystrom, R. (1997). Adolescents report their need for and use of health care services. Journal of Adolescent Health, 21, 388-399.

APPENDIX A

COMPARISON OF PUBLISHED STANDARDS OF THE PAE

<p><i>GCI/PE</i></p> <p>Qualifications: MD/DO, resident and nurse practitioner</p> <p>Time of evaluation: ideal 4-6 weeks prior</p> <p>Frequency: <i>annually</i></p> <p>Preference of method: 1. <i>Office based</i> 2. <i>Station based</i></p> <p>Interim evaluations: only if injury occurs</p> <p>Routine tests: none</p> <p>Medical History: see sample form</p> <p>Physical Exam: height weight eyes-snellen and pupil nose lungs cardiovascular: BP, pulse Abdomen: Masses, tenderness and organomegaly Genitalia females: external exam</p>	<p><i>Preparticipation Physical Evaluation Task Force, 1997</i></p> <p>MD/DO</p> <p>6 weeks prior</p> <p>annually</p> <p>1. <i>Office based</i> 2. <i>Station based</i></p> <p>only if injury occurs</p> <p>only if findings indicate</p> <p>height weight eyes-snellen and pupils nose lungs cardiovascular: BP, pulse abdomen: masses, tenderness and organomegaly</p> <p>Genitalia (males only)</p>	<p><i>Sports Care, Shawnee Mission Medical Center, 1994</i></p> <p>not indicated</p> <p>evaluate for exercised induced asthma Include assessment of body weight control behavior and risk of dependency upon alcohol and drugs</p>	<p><i>Pediatric Annals 1997</i></p> <p>Physician</p>	<p>Hawaii Physician Panel 1995</p> <p>physician</p> <p>self determination Tanner scale</p>

COMPARISON OF PUBLISHED STANDARDS OF THE PAE

<p>GCIPCE</p> <p>males single or undescended testicle Testicular mass Both: Tanner and Hernia Skin-rashes or lesions Musculoskeletal System (see next page)</p> <p>Clearance: (See appendix D) 1. unrestricted 2. clearance after completion of further evaluation 3. not cleared for certain types of sports or for all sports see tables</p>	<p><i>Preparticipation Physical Evaluation Task Force, 1997</i></p> <p>single or undescended testicle Testicular mass Hernia Skin-rashes or lesions Musculoskeletal System (see next page)</p> <p>Clearance: 1. unrestricted 2. clearance after completion of further evaluation 3. not cleared for certain types of sports or for all sports see tables</p>	<p>Sports Care, Shawnee Mission Medical Center, 1994</p>	<p>Pediatric Annals 1997</p>	<p>Hawaii Physician Panel 1995</p>
---	---	--	------------------------------	------------------------------------

COMPARISON OF PUBLISHED STANDARDS OF THE PHYSICAL EXAMINATION OF THE PAE

RECOMMENDED STANDARDS FOR GCIPCE	Preparticipation Physical Evaluation Task Force, 1997	90 second orthopedic screening exam Bratton, 1995	2 Minute Orthopedic Examination Pediatric Annals, 1997	Smith, Lombardo, Robinson, 1991
Stand facing examiner Look at the ceiling, floor, over both shoulders; touch shoulder to ear Shrug shoulders (examiner provides resistance) Hold your arms out to your sides (examiner provides resistance) Place your hands behind your head (shoulder abduction and external rotation); place your hands behind your back (shoulder adduction and internal rotation) Bend and straighten your elbows	<i>Inspection of athlete facing forward (symmetry)</i> <i>Forward flexion, extension, rotation, lateral flexion of neck (ROM, cervical spine)</i> <i>Resisted shoulder shrug (strength, trapezius)</i> <i>Resisted shoulder abduction (strength, deltoid)</i> <i>Internal and external rotation of shoulder (ROM, glenohumeral joint)</i> <i>Extension and flexion of the elbow (ROM, elbow)</i> <i>Pronation and supination of elbow,</i>	Stand facing examiner Look at the ceiling, floor, over both shoulders; touch shoulder to ear Shrug shoulders (examiner provides resistance) Abduct shoulders 90 degrees (examiner provides resistance) Fully rotate arms externally Flex and extend elbows With arms at sides and elbows flexed	Stand facing examiner Look at the ceiling, floor; touch your right (left) ear to your right (left) shoulder; turn your head to the right, left Shrug shoulders (examiner provides resistance) Hold your arms out to your sides (examiner provides resistance) Place your hands behind your head (shoulder abduction and external rotation); place your hands behind your back (shoulder adduction and internal rotation) Bend and straighten your elbows	Patient facing examiner Neck flexion, extension, right and left lateral flexion and rotation Resisted shoulder shrug Resisted shoulder abduction Shoulder internal and external rotation with arms 90 abducted Elbow flexion and extension Elbow and wrist Pronation and

COMPARISON OF PUBLISHED STANDARDS OF THE PHYSICAL EXAMINATION OF THE PAE

Recommended Standards for GCIPCE	Preparticipation Physical Evaluation Task Force, 1997	90 second orthopedic Bratton, 1995	2 Minute Orthopedic Examination Pediatric Annals, 1997	Smith, Lombardo, Robinson, 1991
<p>With your arms at your sides and your and your elbows bent, turn your hands over</p> <p>Spread your fingers, make a fist</p> <p>Patient facing away from examiner</p>	<p>(ROM, elbow and wrist)</p> <p>Clench fist, then spread fingers (ROM, hand and finger)</p> <p>Inspection, athlete facing away from examiner (symmetry of trunk, upper extremities)</p> <p>Back flexion with knees straight, facing toward and away from examiner (ROM, thoracic and lumbar spine; spine curvature; hamstring flexibility)</p>	<p>pronate and supinate wrists.</p> <p>Spread your fingers, make a fist</p> <p>With knees straight, touch toes</p>	<p>With your arms at your sides and your and your elbows bent, turn your</p> <p>Spread your fingers, make a fist</p> <p>Turn around (stand with back to examiner)</p> <p>With your knees straight, bend forward and touch your toes</p>	<p>supination with arms adducted at side and elbows 90 flexed</p> <p>Clench fist then spread fingers</p> <p>Patient facing away from examiner</p> <p>Back flexion with knees straight</p>

COMPARISON OF PUBLISHED STANDARDS OF THE PHYSICAL EXAMINATION OF THE PAE

Recommended standards for GCIPCE	Preparticipation Physical Evaluation Task Force, 1997	90 second orthopedic Bratton, 1995	2 Minute Orthopedic Examination Pediatric Annals, 1997	Smith, Lombardo, Robinson, 1991
Tighten and relax quadriceps muscles	<i>Inspection of lower extremities, contraction of quadriceps muscles (alignment, symmetry)</i>	Tighten and relax quadriceps muscles	Tighten your thigh muscle	Lower extremity examination with patient facing examiner, then contraction of quadriceps simultaneously
"Duck walk" (buttocks on heels) four steps away from examiner and back to examiner	<i>"Duck walk" four steps (motion of hip, knee and ankle; strength; balance)</i>	"Duck walk" (buttocks on heels) four steps away from examiner and back to examiner	Walk like a duck, take four steps	Squat and 'duck walk' 4 steps
Raise up on toes, raise on heels	<i>Standing on toes, then on heel (symmetry, calf; strength; balance)</i>	Raise up on toes, raise on heels	Stand on your heel, stand on your toes	Patient standing on toes (facing away from examiner) and then on heels (facing examiner)

APPENDIX B

Recommended Standards

Qualifications

MD/DO, resident and nurse practitioner

Time of evaluation

4-6 weeks prior to first sport participating in in the school year

Frequency

annually

Preference of method

1. Office based
2. Station based

Interim evaluations

only if injury occurs

Routine tests

none

Health History and Risk Assessment

see Appendix C

The health care provider should validate health risk assessment questions 17-22 privately with the adolescent athlete.

Physical Exam

Height/weight

BP

Snellen

Ear/eyes/throat

Lymph nodes

Lungs

Cardiovascular: murmur, arrhythmia

Abdomen: masses, tenderness and organomegaly

Genitalia

both: Tanner, hernia

males: single or undescended testicle, testicular mass,

females: lesions, discharge, swelling

Skin-rashes or lesions

Musculoskeletal Exam

(Adopted from the 2 minute Orthopedic Examination, American Academy of Pediatrics, Sports Medicine: Health Care for Young Athletes, 1991)

- Symmetry- stand facing examiner

🕒 ❖ Neck and cervical spine-look at the ceiling, floor, over both shoulders;
touch shoulder to ear (*ROM*)

🕒 ❖ Shoulders- shrug shoulders- examiner provides resistance (*strength, trapezius*)

Hold your arms out to your sides - examiner provides resistance (*strength, deltoid*)

Place your hands behind your head (*shoulder abduction and external rotation*)

Place your hands behind your back (*shoulder adduction and internal rotation, ROM, glenohumeral joint*)

- *Elbow and wrist- bend and straighten your elbow (ROM)*

With your arms at your sides and your elbows bent, turn your hands over (ROM)

- *Hand and fingers- spread your fingers, make a fist (ROM, hand and fingers)*
- *Symmetry of trunk and upper extremities- patient facing away from examiner*
- *Spine- with your knees straight, bend forward and touch your toes, back extension of knees, straighten (ROM, thoracic and lumbosacral spine: spine curvature: hamstring flexibility)*
- *Legs and thigh- tighten and relax quadriceps muscles (alignment, symmetry)*
- *Knee, ankle and hip- "Duck walk" (buttocks on heels) four steps away from examiner and back to examiner (motion of hip, knee and ankle; strength; balance)*
- *Calf- raise up on toes, raise up on heels (symmetry, calf; strength; balance)*
-

APPENDIX C

PRE-PARTICIPATION HEALTH HISTORY AND RISK ASSESSMENT

Name _____ Sex _____ Age _____ Date of birth _____

Grade _____ School _____ Sport(s) _____

Address _____

Personal physician _____

In case of emergency contact:

Name _____ Relationship _____ Phone(H) _____ (W) _____

Explain "Yes" answers below. Circle questions you don't know the answer to.			
	Yes	No	
1. Have you had a medical illness or injury since your last checkup or sports physical?	_____	_____	
2. Have you ever been hospitalized overnight? Have you ever had surgery?	_____	_____	
3. Are you currently taking any prescription or nonprescription medications or pills using an inhaler?	_____	_____	
4. Do you have any allergies (i.e., to pollen, medicine, food or stinging insects)? Have you ever had a rash or hives develop during or after exercise?	_____	_____	
5. Have you ever passed out during or after exercise? Have you ever had chest pain during or after exercise? Do you get tired more quickly than your friends do during exercise? Have you ever had racing of your heart or or skipped heartbeats? Have you had high BP or high cholesterol? Ever been told you have a heart murmur? Has any family member or relative died of heart problems or of sudden death before 50? Have you had a severe viral infection (i.e., myocarditis or mono) within the last month?	_____	_____	
6. Do you have any current skin problems (i.e., itching, rashes, acne, warts, fungus or blisters)?	_____	_____	
7. Have you ever had head injury or concussion? Have you ever been knocked out, become unconscious or lost your memory? Have you ever had a seizure? Do you have frequent or sever headaches? Have you ever had numbness or tingling in your arms, hands, legs or feet?	_____	_____	
8. Do you cough, wheeze or have trouble breathing during or after activity? Do you have asthma?	_____	_____	
9. Have you ever become ill from exercising in the heat?	_____	_____	
10. Do you use any special protective or corrective equipment or devices that aren't usually used for your sport or position (knee brace, hearing aid, etc.)?	_____	_____	
			11. Have you had any problems with your eyes or vision? Do you wear glasses, contacts or protective eye wear?
			12. Have you ever had a sprain, strain or swelling after an injury? Have you broken or fractured any bones or dislocated any joints?
			13. Do you want to weigh more or less than you do now? <input type="checkbox"/> More <input type="checkbox"/> Less Do you lose weight regularly to meet requirements for your sport? <input type="checkbox"/> Yes <input type="checkbox"/> No
			14. Do you feel stressed out? <input type="checkbox"/> Yes <input type="checkbox"/> No
			15. Record the dates of your most recent immunizations (shots) for: Tetanus _____ Measles _____ Hepatitis B _____ Chicken pox _____
			16. Do you use your seat belt? <input type="checkbox"/> Yes <input type="checkbox"/> No
			17. Have you ever considered suicide? <input type="checkbox"/> Yes <input type="checkbox"/> No
			18. Do you have access to weapons? <input type="checkbox"/> Yes <input type="checkbox"/> No
			19. Do you smoke cigarettes or marijuana? <input type="checkbox"/> Yes <input type="checkbox"/> No
			20. Do you drink alcohol? If yes, how often? _____ <input type="checkbox"/> Yes <input type="checkbox"/> No
			21. Have you ever used drugs to enhance your athletic performance? <input type="checkbox"/> Yes <input type="checkbox"/> No
			22. Are you sexually active? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, what type of birth control do you use? _____
			23. Have you been a victim of violence? <input type="checkbox"/> Yes <input type="checkbox"/> No
			FEMALES ONLY:
			24. When was your 1st menstrual period? _____ When was your most recent period? _____ How much time do you usually have from the start of one period to the start of another? _____ How many periods have you had in the last year? _____
			Explain "yes" answers here: _____ _____ _____

I hereby state that to the best of my knowledge, my answers to the above questions are complete and correct.

Signature of athlete _____

Signature of parent/guardian _____

Date _____

Adapted from 1997 American Academy of Family Physician, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine, and American Osteopathic Academy of Sports Medicine.

APPENDIX D

**Advisability of Participation in Competitive Sports for
Children and Adolescents with Various Medical Conditions**

Condition	Contact sport Significant contact or collision	Limited contact or collision	Noncontact sport Strenuous	Moderately strenuous	Non- strenuous
Acute illness	Depends on specific problem (e.g., contagiousity, risk of worsening disease)				
Asthma	Yes	Yes	Yes	Yes	Yes
Atlantoaxial instability	No	No	Yes, except for butterfly or breast stroke or diving starts in swimming	Yes	Yes
Carditis	No	No	No	No	No
Congenital heart disease	Patients with mild forms may participate in all sports; those with severe forms or who have undergone recent surgery require individual evaluation.				
Convulsive disorder Well controlled Poorly controlled	Yes No	Yes No	Yes Yes, except for swimming and weight lifting	Yes Yes	Yes Yes, except for archery and riflery
Detached retina	Before any sports activities, an ophthalmologist should be consulted.				
Enlarged liver	No	No	Yes	Yes	Yes
Enlarged spleen	No	No	No	Yes	Yes
Function in one eye only	Participation in most sports is allowed with use of eye guards approved by American Society for Testing Materials, but individual evaluation is required.				
History of serious head or spine trauma, repeated concussions, or craniotomy	IA	IA	Yes	Yes	Yes
Hypertension Mild Moderate Severe	Yes IA IA	Yes IA IA	Yes IA IA	Yes IA IA	Yes IA IA
Inguinal hernia	Yes	Yes	Yes	Yes	Yes
Musculoskeletal disorder	IA	IA	IA	IA	IA
Pulmonary insufficiency	Participation usually allowed if oxygenation remains satisfactory during graded stress test				Yes
Sickle cell trait	Yes	Yes	Yes	Yes	Yes
Skin disease (boils, herpes, impetigo, scabies)	No gymnastics on mats, martial arts, wrestling, or contact sports during contagious period		Yes	Yes	Yes
Solitary kidney	No	Yes	Yes	Yes	Yes
Solitary ovary	Yes	Yes	Yes	Yes	Yes
Testis undescended or absent	Use of protective cup recommended in certain sports		Yes	Yes	Yes

*Individual assessment required

American Academy of Pediatrics Committee on Sports Medicine (1994).

APPENDIX E

PRE-PARTICIPATION PHYSICAL EVALUATION

PHYSICAL EXAMINATION

Name _____		Date of birth _____	
Height _____	Weight _____	Pulse _____	BP ____/____ (____/____, ____/____)
Vision R 20/____	L 20/____	Corrected: Y N	Pupils: <input type="checkbox"/> Equal <input type="checkbox"/> Unequal

	Normal	Abnormal Findings	Initials*
MEDICAL			
Eyes/Ears/Nose/Throat			
Lymph nodes			
Heart			
Lungs			
Abdomen			
Genitalia (males only)			
Skin			
MUSCULOSKELETAL			
Symmetry			
Neck			
Back			
Shoulder/arm			
Elbow/forearm			
Wrist/hand			
Spine/thighs			
Hip			
Knee			
Leg/ankle			
Foot			

CLEARANCE

- Cleared
- Cleared after completing evaluation/rehabilitation for _____

Not cleared for: _____ Reason: _____

Recommendations/education provided: _____

Name of provider (print/type) _____ Date _____

Address _____ Phone _____

Signature of provider _____, MD, DO, NP

*Station-based examination only

1997 American Academy of Family Physician, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine, and American Osteopathic Academy of Sports Medicine.

APPENDIX F

**Classification of Sports by Amount of
Contact and Energy Involved**

Contact Significant contact or collision	Limited contact or impact	Noncontact Strenuous	Moderately strenuous	Non- strenuous
Boxing Field hockey Football Ice hockey Lacrosse Martial arts Rodeo Soccer Wrestling	Baseball Basketball Bicycling Diving Gymnastics High jump Horseback riding Pole vault Skating (ice, roller) Skiing (downhill, cross-country, water) Softball Squash, handball Tennis Volleyball	Aerobic dancing Discuss toss Fencing Javelin toss Rowing Running Shot put Swimming Track Weight lifting	Badminton Curling Table tennis	Archery Golf Riflery

American Academy of Pediatrics Committee on Sports Medicine (1994).

APPENDIX G

RECOMMENDED MEDICAL CONDITIONS AND SPORTS PARTICIPATION

Condition	Explanation	May Participate?
Atlantoaxial instability (instability of the joint between cervical vertebrae 1 and 2)	Athlete needs evaluation to assess risk of spinal cord injury during sports participation.	Qualified yes
Bleeding disorder	Athlete needs evaluation.	Qualified yes
Cardiovascular diseases - Carditis (inflammation of the heart)	Carditis may result in sudden death with exertion.	No
-Hypertension (high blood pressure)	Those with significant essential (unexplained) hypertension should avoid weight and power lifting, body building, and strength training. Those with secondary hypertension (hypertension caused by a previously identified disease) or severe essential hypertension, need evaluation.	Qualified yes
- Congenital heart disease (structural heart defects present at birth)	Those with mild forms may participate fully; those with moderate or severe forms or who have undergone surgery need evaluation.	Qualified yes
Dysrhythmia (irregular heart rhythm)	Athlete needs evaluation because some types require therapy or make certain sports dangerous or both.	Qualified yes
Mitral valve prolapse (abnormal heart valve)	Those with symptoms (chest pain, symptoms of possible dysrhythmia) or evidence of mitral regurgitation (leaking) on physical examination need evaluation. All others may participate fully.	Qualified yes
Heart murmur	If the heart murmur is innocent (does not indicate heart disease), full participation is permitted; otherwise, the athlete needs evaluation (see "congenital heart disease" and "mitral valve prolapse" above).	Qualified yes
Cerebral palsy	Athlete needs evaluation.	Qualified yes
Diabetes mellitus	All sports can be played with proper attention to diet, hydration, and insulin therapy. Particular attention is needed for activities that last 30 minutes or more.	Yes
Diarrhea	Unless disease is mild, no participation is permitted because diarrhea may increase the risk of dehydration and heat illness (see "Fever" below).	Qualified no
Eating disorders (anorexia nervosa, bulimia nervosa)	These patients need both medical and psychiatric assessment before participation.	Qualified yes
Eyes (functionally one-eyed athlete, loss of an eye, detached retina, previous eye surgery, or serious eye injury)	A functionally one-eyed athlete has a best corrected visual acuity of <20/40 in the worse eye. These athletes would suffer significant disability if the better eye was seriously injured as would those with loss of an eye. Some athletes who have previously undergone eye surgery or had a serious injury may have an increased risk of injury because of weakened eye tissue. Availability of eye guards approved by the American Society for Testing Materials and other protective equipment may allow participation in most sports, but this must be judged on an individual basis.	Qualified yes
Fever	Fever can increase cardiopulmonary effort, reduce maximum exercise capacity, make heat illness more likely, and increase orthostatic hypotension during exercise. Fever may rarely accompany myocarditis or other infections that may make exercise dangerous.	No

APPENDIX H

**Preparticipation Physical Evaluation
CLEARANCE FORM**

Cleared

Cleared after completing evaluation/rehabilitation for: _____

Not cleared for: _____ Reason: _____

Recommendations: _____

Name of provider (print/type) _____ Date _____

Address _____ Phone _____

Signature of provider _____, MD, DO or NP

1997 American Academy of Family Physician, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine, and American Osteopathic Academy of Sports Medicine.

**Preparticipation Physical Evaluation
CLEARANCE FORM**

Cleared

Cleared after completing evaluation/rehabilitation for: _____

Not cleared for: _____ Reason: _____

Recommendations: _____

Name of provider (print/type) _____ Date _____

Address _____ Phone _____

Signature of provider _____, MD, DO or NP

1997 American Academy of Family Physician, American Academy of Pediatrics, American Medical Society for Sports Medicine, American Orthopedic Society for Sports Medicine, and American Osteopathic Academy of Sports Medicine.

MICHIGAN STATE UNIVERSITY LIBRARIES



3 1293 02374 4885