Practice Guidelines

Preparticipation Physical Evaluation: AAFP and Others Update Recommendations

Key Points for Practice

- The PPE should be performed as part of an athlete's routine preventive medical care with their primary physician.
- Comprehensive PPEs are recommended every two to three years with annual focused history updates in intervening years.
- Personal and family history should be reviewed for risk factors of sudden cardiac death.
- Musculoskeletal evaluation should be primarily focused on previous injuries and current symptoms.
- Screening for anxiety or depression symptoms should be included in PPEs.

From the *AFP* Editors

The American Academy of Family Physicians (AAFP), the American Academy of Pediatrics, the American College of Sports Medicine, the American Medical Society for Sports Medicine, the American Orthopedic Society for Sports Medicine, and the American Osteopathic Academy of Sports Medicine have published the 5th edition of the preparticipation physical evaluation (PPE) monograph. Revisions include new mental health and transgender sections and expansion of the female athlete chapter. Additions to existing chapters include evaluation timing and format, musculoskeletal screening for increased injury risk, more discussion of relative energy deficiency, and screening recommendations for athletes with disabilities.

Timing and Location for PPEs

Ideally, the PPE is incorporated into regular preventive health care visits with an athlete's primary physician to ensure comprehensive knowledge of the athlete's personal and family history. Group or station-based examinations and evaluation in urgent care or retail clinics are discouraged because of the loss of continuity and medical history. Goals of the PPE are characterization of athletes' physical and psychological health and evaluation for potentially life-threatening conditions or predisposition for injury or illness. The PPE is an opportunity to provide health and lifestyle counseling and connect young people with medical care. The PPE should be performed by clinicians prepared to address the full scope of issues potentially encountered. Evaluations should be conducted at least six weeks before the start of practices to allow follow-up for any identified concerns.

Although evidence supporting specific evaluation frequency is lacking, high school and younger athletes are recommended to receive a comprehensive PPE every two to three years with an annual focused history update in intervening years. For college athletes, a single comprehensive evaluation during the first year of school followed by annual history updates is recommended. Updated forms should be used to standardize examination content and facilitate further evaluation and refinement *(Table 1)*. Clinicians are requested to consistently use the International Classification of Diseases (ICD)-10 code Z02.5 to facilitate research.

Evaluation for Sudden Cardiac Death Risk

A key PPE element is assessment of personal and family history to identify athletes at risk for sudden cardiac death. A focused cardiac examination should include auscultation for murmurs, palpation of femoral pulses, examination for stigmata of Marfan syndrome, and seated blood pressure. Screening all athletes with electrocardiography is not recommended, although it may be considered in higher-risk athletes, such as participants in men's collegiate basketball. If electrocardiography is used for screening, specific interpretation criteria are recommended for athletes.

This series is coordinated by Sumi Sexton, MD, editor-in-chief.

A collection of Practice Guidelines published in *AFP* is available at https://www.aafp.org/afp/practguide.

CME **This clinical content** conforms to AAFP criteria for CME. See CME Quiz on page 649.

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TABLE 1

Preparticipation Physical Evaluation Forms

History form (in English and Spanish)	https://www.aap.org/en-us/Documents/PPE-History-Form-%28English%29.pdf https://www.aap.org/en-us/Documents/PPE-History-Form-%28Spanish%29.pdf
Physical examination form	https://www.aap.org/en-us/Documents/PPE-Physical-Examination-Form.pdf
Medical eligibility form	https://www.aap.org/en-us/Documents/PPE-Medical-Eligibility-Form.pdf
Athletes with disabilities form: supplement to the athlete history	https://www.aap.org/en-us/Documents/PPE-Athletes-with-Disabilities-Form.pdf

Concussion

Athletes with a history of concussion identified during PPE should not participate unless all symptoms have resolved. Athletes with multiple previous concussions should receive further evaluation before participation. Baseline testing of athletes with computerized neurocognitive testing or other standardized assessments is not generally recommended.

Musculoskeletal Evaluation

Musculoskeletal evaluation should focus on obtaining a history of injuries and current concerns, which will detect 92% of significant injuries. Few assessments have evidence for predicting future injuries, and a general musculoskeletal screening examination has a 50% sensitivity. The box drop test has been shown to predict increased anterior cruciate ligament injury risk with 78% sensitivity. In this test, the athlete jumps from a step and immediately performs a maximal vertical jump. Imbalance or valgus knee deviation on landing suggests increased injury risk and should prompt further evaluation. A single leg squat is a less studied functional risk assessment test.

Mental Health Evaluation

Mental health issues are increasingly recognized in athletes and may be exacerbated by stress of athletic participation. The new history form incorporates the Patient Health Questionnaire-4, a brief screen for depression and anxiety symptoms. Athletes with a positive screen should receive further evaluation. In the absence of suicidal ideation, depression or anxiety should not preclude sports participation, nor should sports participation delay appropriate treatment. The PPE is an opportunity to screen athletes for substance misuse and history of sexual abuse.

Athletes should be screened for disordered eating, particularly in sports with weight classes, aesthetic grading, or where leanness is perceived to confer advantage. Recurrent injuries, stress injuries, and amenorrhea may suggest the female athlete triad, which is part of a broader syndrome known as the Relative Energy Deficiency in Sport (RED-S). RED-S is a syndrome caused by reduced energy intake in relation to physical activity that affects multiple organ systems and occurs in male and female athletes.

Female Athletes

Although PPE principles remain important for all athletes, special attention is required in areas where females have increased morbidity. Noncontact anterior cruciate ligament injuries are more common in females, and screening athletes for risk of injury is recommended. The box jump test and single leg squat test are proposed to identify increased risk. Quantitative evaluations of neuromuscular control, such as the Landing Error Scoring System, can also identify increased injury risk but require specialized equipment. Evidence-based neuromuscular training for anterior cruciate ligament injury prevention is recommended, particularly in high-risk sports.

Menstrual history can provide indicators for several issues that can affect athletes. Secondary amenorrhea is an important symptom of RED-S, and hormonal contraceptives may mask this amenorrhea. Iron deficiency anemia in athletes can be a sign of poor energy intake but is often caused by heavy menstrual bleeding.

Female athletes also have higher rates of concussion and postconcussion syndrome, making screening for previous concussion essential. Concussion mechanisms vary between sexes, even in the same sport.

Transgender Athletes

Medical eligibility in transgender athletes is similar to other athletes. Although controversy exists about whether transgender athletes may compete

TABLE 2

Common Findings in Athletes with Disabilities

Category	Associated illness
Cerebral palsy	Decreased flexibility
	Impaired motor control or strength
	Spasticity
Down syndrome	Atlantoaxial instability
	Congenital heart disease
	Ligamentous laxity
Spinal cord injury/wheelchair athletes	Autonomic dysreflexia
	Chronic shoulder pain
	Increased risk of heat stroke or exhaustion
	Peripheral nerve entrapments
	Pressure ulcers

on women's or men's teams, determinations of competition categories and hormone level measurement are not part of the PPE. Psychosocial evaluation of transgender athletes is important because of high levels of psychiatric morbidity.

Athletes with Disabilities

Athletes with physical or cognitive disabilities gain the same physical and mental benefits from sports participation as other athletes. These athletes generally have more complex medical histories, which increases the importance of continuity of care. History and physical examination should assess for findings commonly associated with the patient's disability *(Table 2)*. Decisions about medical eligibility in athletes with disabilities should follow the same principles as for other athletes with the same goals of inclusion and safe participation.

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Army, Uniformed Services University of the Health Sciences, the Department of Defense, or the U.S. government.

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