

The Pre-Participation Examination

Learn how a pre-participation examination can help avoid injury and improve performance in track and field athletes.

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Fig. 1 – Assess the symmetry of the trunk, pelvis and upper and lower extremity from behind. Pay attention to scapular asymmetry, pelvic un-levelling, hamstrings and calf atrophy.

The popularity of team sport has mushroomed in the last 20 years at amateur and professional levels. One of the consequences of this surge is the increasing incidence of sports injuries.

In the last decade or so the drive to decrease the incidence and severity of sport injuries has been given much attention in the medical field. Health-care providers have implemented and suggested many strategies to lower the incidence of injuries.

A pre-participation examination (PPE) should be the front line of defence. It is a prudent, initial and effective step in the drive to decrease injuries and improve performance. In addition to injury prevention, the PPE also: identifies strengths and deficiencies in athletic abilities (fitness conditioning, biomechanical faults and asymmetries, and congenital disorders); increases the confidence athletes have in their sport medicine team; gives the sports medicine doctor a good grasp of the athletes' level of fitness, flexibility and health prior to the season; is an excellent starting point to implement an educational platform about fitness conditioning, injury prevention and general health and wellness for athletes and coaches; and it allows the opportunity to satisfy the legal requirements for pre-season screening required by insurance

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companies depending on the sport.

Overall, this type of athletic profiling can help determine whether the athlete is fit to participate. In addition, by correcting the deficiencies discovered in the examination, athletic performance can be improved and the frustration level decreased when the etiology of poor performance is unclear.

PRINCIPLES AND GOALS OF PPE

An effective PPE has a well-designed protocol. This can be achieved if certain principles and goals are taken into consideration. Several basic principles help govern the PPE (Kibler), namely:

- The PPE should have a definite goal.
- A reproducible method should be used to obtain the proper information.
- The information should be as objective as possible to allow for measuring or quantifying by easy testing methods.
- The examination should be specific for the intended sport. Hence the testing procedures should be flexible enough to measure the different aspects of the musculoskeletal (MSK) performance that are dominant in that sport.
- The exam should be completed six to eight weeks before the start of the practice season. This allows the athlete time to implement any conditioning that may be required if musculoskeletal deficits are indicated.

There are five goals which should be emphasized when designing the protocol for a PPE for athletes.

1. Provide an objective sport-specific musculoskeletal profile of athletic fitness.
2. Delineate negative information that prohibits, modifies or delays participation.
3. Delineate positive information to decrease injury risk and increase performance.
4. Provide a reproducible record for subsequent exams.
5. Provide a base for sport-specific fitness conditioning.

The PPE has several components that must be addressed for a successful outcome. However, this paper will focus on the MSK examination for track and field athletes. Listed below are the key components of the PPE.

The evaluation protocol, medical history, physical examination, musculoskeletal examination, muscle balance – intra and extra regional, flexibility, strength, speed, power and endurance, agility, joint dysfunction, core/trunk stability, orthopedic and neurological examination, gait assessment, physiological profile, aerobic and anaerobic capacity and isokinetic testing.

Track and field is a very physically demanding sport. It requires sprinting, running, walking, pushing, jumping, hopping and throwing. Consequently, track and field athletes should place emphasis on the power, speed, quickness, agility, relative strength, anaerobic, aerobic and flexibility components of fitness. The nature of the sport depicts the body part where the majority of the injuries will occur, namely the lower extremity, core/trunk, low back and pelvis. Most of these injuries (some 60 per cent according to Kibler) are of the tensile overload stress type (tendonitis, strain, muscle tear or stress fracture) or traumatic in nature (ankle and knee sprains or severe ligament tears).

Fig. 2 – Observe the athlete's back and spine while the trunk is in a forward flexed position with knees extended to detect scoliosis and hamstring flexibility. Hamstring flexibility determined in the standing posture is more functional than in a supine posture for runners.



Fig. 2



Fig. 3

Fig. 3 – Observe the lower extremity from the front. This could reveal excessive pronation or supination of the feet, excessive tibial torsion, knees for genu valgum or varum, and quadriceps (including vastus medialis obliquus) symmetry during contraction and relaxation.

Figs. 4 – Perform functional standing hip flexion testing (active and passive ROM and muscle testing) instead of supine testing. This can be classed as a modified Thomas test. In this position, you should also assess for pelvic stiffening/tilt.



Fig. 4



Fig. 5

Fig. 5 – Observe for appropriate core and accessory muscle firing (movement) patterns. A two-by-four plank walk, can be used to evaluate stability.