

## **Pre-participation Musculoskeletal Exam and Injury Prevention**

A study conducted in association with the Atlanta Peachtree 10 K followed participants over a 10 year period and 30% of the participants stopped running permanently because of an injury. Two other studies reported a drop out rate in marathon training program for those who enter the race has been reported to be 30% to 50% with the most common reason for non-completion being injury (Clough PJ 1987, Fletcher KP 1986).

These studies have applicability for participants in the Richmond Marathon Team in Training program, and the Ukrops Monument Ave 10 K Training program. There is a possibility that training for a road race can be complicated by a repetitive use injury. A potential strategy to decrease the risk of injury is a pre-participation examination.

A pre-participation musculoskeletal screening examination is a common practice and at times required in high school and collegiate sports. To a lesser degree this process has been used with elite level runners, cyclist and triathletes. It can be available to the recreational athlete.

What is included in pre-participation exams can vary, but basically it includes a review of history of previous injury, review of history of exercise/sports training and a physical exam of individual's alignment, flexibility, strength, and coordination/balance testing. The pre-participation exam can be preformed by a primary care provider, or health care professional with sport specific knowledge.

The aim of a pre-participation exam is to identify conditions which might preclude participation, or treatable conditions that might interfere with or be worsened by regular exercise/training. Another aim is to identify specific weakness, limitation, or impairment which if corrected should result in improved performance in sporting activity.

In a large scale study by J Smith (1998) of high school students under going pre-participation examinations 2% were disqualified from participating in sports, and 12% were identified as having impairments that needed intervention and follow up. Of the students disqualified from participation 44% were disqualified because of musculoskeletal problems.

A systematic review of the scientific literature conducted by Peter J Carek (2002) concluded current research fails to demonstrate whether a pre-participation examination has an effect on the overall morbidity and

mortality rates in athletes. The standard pre-participation exam for scholastic athletes is concerned with preventing death from heart disease. He noted the most frequent reason for disqualifying an athlete from participation was a musculoskeletal problem. The practice of providing a pre-participation exam for athletes is neither supported nor refuted by the current medical literature due to inadequacies of research data available.

Dr. James Garrick (2004) conducted a in depth literature review looking for evidence to support the use of pre-participation orthopedic examinations and concluded health care practitioners should be aware of the absence of data linking virtually any of the findings from an examination to either an increase or decrease in the likelihood of future injury.

There are several reasons why the scientific community has been unable to provide convincing evidence to support the assertion that a pre-participation screening exam can predict and prevent injury.

Dr. Garrick's review of the literature identified research in which the pre-participation musculoskeletal examination was conducted by Family Practice Physicians (Generalist) with ancillary help. Perhaps a cursory exam by a generalist is not sensitive enough to identify subtle but significant musculoskeletal weaknesses, limitations, or impairments. Perhaps, a pre-participation exam conducted by a specialist with sport specific knowledge would have greater success in predicting what injuries would occur and more importantly, is able to develop strategies to prevent their occurrence.

The type of physical exam may not be sensitive enough to identify problems. The standard musculoskeletal screening examination involves joint range of motion measurements, observing muscle size. The criterion is whether there is symmetry between the right and left side of the body.

Dr F. Noyes and his colleagues have studied female soccer players and developed a extensive body of evidence using dynamic neuromuscular testing to identify asymmetry. They are able to successfully predict which athletes would suffer knee ligament tears. More importantly, Dr. Noyes' group have been able to identify at risk females, have them complete a 6 week training and conditioning program resulting in decreased frequency of knee ligament injuries. This body of research is focused to a very narrow population, but the process of testing using dynamic functional tasks to identify asymmetries and intervening to alleviate the asymmetry resulting in less frequent injury is exciting.

Despite the fact that evidence is contradictory and weak the concept of pre-participation orthopedic examination to identify weakness, limitations, and impairments so that interventions can be undertaken to prevent injury the concept is still plausible. The lack of hard evidence presents a challenge to the health care professional to gather outcome data to support the contention that a pre-participation exam can prevent injury.

If you are intrigued with idea trying to complete your first marathon there is the possibility that your attempt will be thwarted by an injury. One proactive strategy to avoid injury is to seek a pre-participation musculoskeletal screening exam from a sport specific health care professional, and to develop a specific remedial intervention to address identified weakness, limitations and impairments.