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Preseason Conditioning for High School Athletes

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IN THE UNITED STATES MILlions of high school students participate in school-sponsored sports. Provided that qualified coaching is available and appropriate training guidelines are followed, youth sport programs provide teenagers with an opportunity to enhance their fitness, improve selected skills, make friends, and have fun. However, there is the potential for injury or illness to occur if a young athlete's musculoskeletal system is ill prepared to handle the duration and magnitude of forces that develop during practice and game situations.

It appears that today's young athletes are less active outside of their sports seasons and therefore less prepared for vigorous sports participation. In the United States, participation in all types of physical activity declines as grade in school increases, and daily attendance in high school physical education has decreased from about 42 to 25% (9). Further, sedentary pursuits such as television viewing and "surfing" the internet continue to occupy a significant amount of time during the school-age years (4). According to some observers, an estimated 50% of overuse injuries sustained by young athletes while playing organized sports could be prevented if participants were better prepared to play the game (8).

While the total elimination of youth sport injuries is an unrealistic goal, it seems prudent for high school athletes to participate in at least 6 weeks of preparatory conditioning (including general strength, aerobic, and flexibility exercises) prior to sports participation (2, 6). Because high school athletes are often forced to train harder and longer in order to excel in sports, providing them with an opportunity to participate in a preseason conditioning program that prepares them for the demands of sports participation seems reasonable and worthwhile. During this time correctable risk factors such as muscle imbalance, poor flexibility, and poor physical condition could be identified and corrected by physicians, therapists, and strength and conditioning specialists. Further, sensible conditioning guidelines and information on proper nutrition could be provided. If the preparticipation physical examination (including cardiovascular and musculoskeletal screening) was conducted at least 6–8 weeks before the season starts, young athletes at risk for injury or illness could be identified early and treated appropriately with adequate time to prepare for competition.

Several reports suggest that participation in a conditioning program that includes strength training may increase a young athlete's resistance to injury. In one report involving 13–19-year-old male and female athletes, it was noted that the athletes who strength trained had a lower injury rate and required less time for rehabilitation when compared to their teammates who did not strength train (5). Others noted that strength training decreased the number and severity of knee injuries in high school football players (2) and the incidence of shoulder pain in teenage swim-

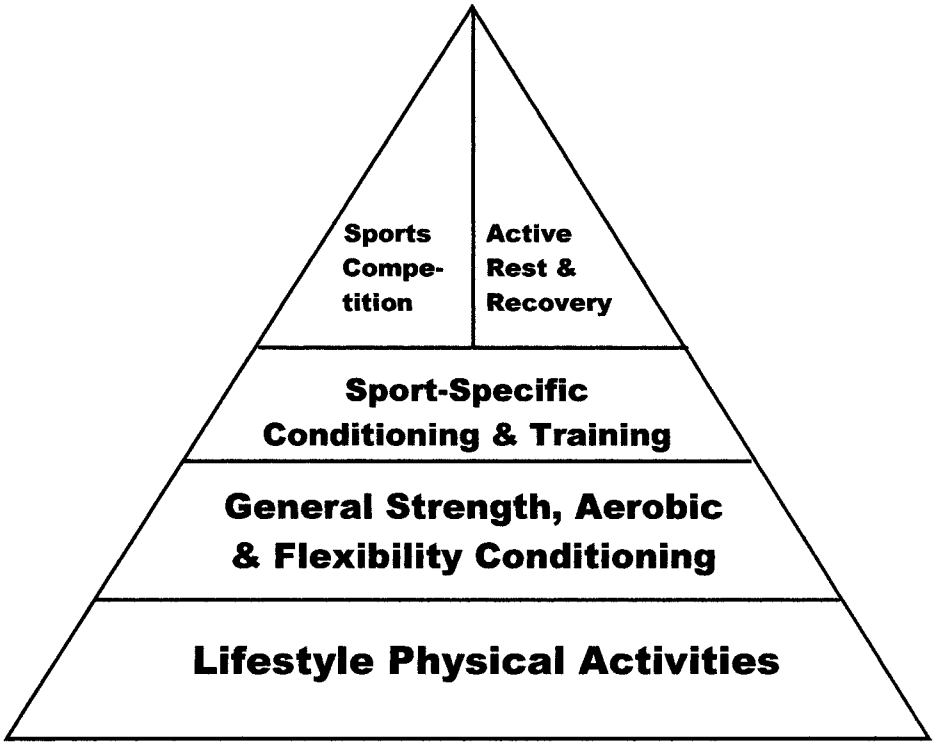

Figure 1. **General physical activity recommendations which suggest that preparatory conditioning should precede sports competition.**

mers (3). While the likelihood that preseason conditioning could prevent more serious injuries has not yet been explored, it is attractive to assume that high school athletes who are better prepared for sports participation may be more likely to experience the enjoyment of sports competition and less likely to drop out due to frustration, embarrassment, failure, and injury.

A youngster's participation in sport need not start with competition, but rather evolve out of preparatory conditioning (see Figure 1). While each sport has its own conditioning requirements, all conditioning programs have the common goal of improving athletic performance and preventing injury. In some cases, aspiring young athletes may need to decrease the time they spend practicing sport-specific skills in order to allow time for conditioning exercises. Although some high school athletes may attempt to play themselves into shape, it may be difficult for them to gain the specific benefits from an activity such as strength training without actually participating in a strength-training program.

Ideally, all male and female high school athletes should participate in a periodized conditioning program that varies in volume and intensity throughout the year. In one coed afterschool conditioning program it was noted that high school athletes were better prepared for sports participation because they developed qualities of general athleticism and enhanced their self confidence to perform "natural functional movements" (7). These findings may be particularly important for female athletes who appear to be at greater risk for knee injuries (1). Although many factors may contribute to the incidence of knee injuries in female athletes, increasing the level of physical activity prior to sports participation, maintaining physical fitness during the season, and enhancing physical condition during the offseason merits consideration. In one study it was shown that a conditioning program that included plyometric training had a favorable effect on knee stabilization in female high school volleyball players (6).

It is the shared responsibility of parents, coaches, teachers, and health care providers to ensure that young athletes develop the necessary skills and abilities prior to facing the demands of sports training and competition. While additional clinical trials are needed to determine the most effective method of reducing the incidence of sports-related injuries in high school athletes, it appears that a preseason conditioning program that includes strength training could offer a protective effect by enhancing the strength and integrity of the musculoskeletal system and developing fundamental fitness abilities such as speed, strength, and power. ▲

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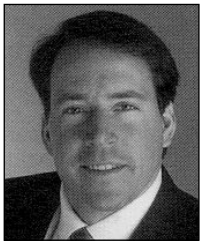

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