

OVERUSE INJURIES

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Excelling in sports today requires the young athletes to train longer, harder, and earlier in life. A high school runner may average over 30-40 miles per week in training runs. Some 3-6 hours a day in the pool or gym is the average time for junior swimmers or gymnasts. Newcomers to sport, although not training at such high intensities, also subject their bodies to the rigors of training year round as they migrate from sport to sport.

Exercise and sport participation is an extremely valuable component in the developing life of a child or adolescent. The rewards of such dedication to sports activities are tremendous; the increased level of fitness, better performance, faster times, and the satisfaction of achieving a personal goal cannot be overlooked. Athletes today, of every class from neophyte to professional, push themselves to the limit for personal satisfaction. However, this high standard of achievement, combined with high intensity training, does not come without a price; a price sometimes too painful to pay. The price is **"overuse injuries."**

Overuse injuries in athletes are caused mostly by misuse, abuse, and overuse. The indulgence of athletes to an exclusive sport, and undergoing a rigorous high intensity program, will predispose them to overuse injuries. The fact is, they do too much, too soon. This type of repetitive subjects the athletes to **repetitive microtrauma** (i.e. tears, friction, abnormal rubbing, stress fractures, etc.) to their body parts, that is particular to their sport; it is microtrauma that that is the major cause of overuse injuries. The end result of these frictional, tractional, and cyclic loading forces is **inflammation** of the involved structures.

There is a dramatic rise in the case of overuse injuries since the 1960's because more children and adolescents are involved in recreational and competitive sports. In 80% of cases, the athlete has recently taken up the sport or has increased his or her training intensity a few days to a couple of weeks prior to the onset of symptoms. In other cases, they might have started participating in a second activity (i.e. weight lifting, aerobics) that have similar biomechanics (body movements) that provide added stress, which in turn initiates the injury.



If the injury is not treated, which often is the case, and the athlete tries to ignore or “run through” the injury, the symptoms will progress. The pain patterns for overuse injury are, in the **early phase**: mild pain, little or now swelling, and tenderness after workout or competition.

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If the athlete continues training at the same intensity, they will notice pain and slight involuntary alteration of biomechanics near the end of the workout, lasting several minutes to hours after the workout. In the **mid-phase**, continuation of the workout gives moderate pain and tenderness at the beginning of the workout. This, however, may disappear after several minutes, (of “**running through the injury**”) only to markedly return at the end of the workout. Pain and disability are now evident at the end of the workout and may appear several times during the day (walks, going up and down stairs, etc.) Often, there is also morning stiffness and pain.

The final progression or **late stage** is severe pain, tenderness and disability that are present most of the day and severe enough to prevent involvement in training and competition. The scenario is a progression of mild to severe and this pattern is a very important clue to the physician in making the diagnosis, prescription of the treatment, and rehabilitation schedule. From my experience, the earlier the condition is dealt with, the more rapid the response to treatment (i.e. recovery.)

But what is responsible for such annoying injuries? Many factors are responsible for the microtrauma that causes overuse injuries. The risk factors include: training error, muscle/tendon imbalance, anatomic malalignment, footwear, playing surface, equipment, associated disease state, nutritional factors, and cultural deconditioning.

Now that we have dealt with the causes, how can these debilitating injuries be prevented? The body’s common response to most overuse injuries is **inflammation**. Therefore, the goal of the treatment program is to reduce inflammation through rest or alteration of activities, combined with physical modalities. Although the above-mentioned measures must receive special emphasis, it is evident that one of the most important components of sports medicine practice, particularly in the young athlete, is preventative measures. Proper identification of the risk factors, both of host and environment, which appear to be responsible for the injury should be a first step in proper treatment. This in turn may help prevent the reoccurrence of similar injuries. To



execute this regime, preseason physical examinations (PPE) and pre-participation evaluation (PE) of athletes should be a must.

RUNNING SKILLS

From *Mechanics of Sport, a Practitioner's Guide* by Gerry Carr. Human Kinetics Publications, 1997, p.162

Skill Highlights

1. The time an athlete takes running over a set distance depends upon the athlete's stride length and stride frequency. The length of the athlete's legs and the forward thrust that occurs with each stride determine the stride length. Forward thrust is produced by the earth's reaction force responding to the athlete's backward thrust against the earth's surface. Stride frequency is the cadence that the athlete uses (i.e., the number of strides that occurs each second.)
2. A runner's technique changes the faster the athlete runs. Sprinters spend more time in the air than distance runners. In addition, they swing their arms more vigorously. Sprinters also have higher knee lift, greater leg thrust, and a higher flexed leg. Distance runners use less arm action but tend to swing their shoulders more than sprinters. The longer the distance, the greater the reliance on cardiovascular endurance and pacing. All elite runners hold their torsos close to perpendicular.
3. Tension is detrimental to all runners because tension saps energy and restricts muscle action and limb movement. Sprinters try to run explosively while still relaxing their faces, necks, shoulders, and hands. Distance runners use the same relaxation techniques.

THE 10-POINT PLAN TO OBTAIN NEW SHOES

1. Examine your old shoes
2. Look at your feet
3. Review your injury history
4. Analyze your running style
5. Evaluate your training habits
6. Match your needs with the shoe's technical properties
7. Find a good running shoe store
8. Try on several pairs
9. Get tough on quality control
10. Go easy the first few weeks



The first five points are the most important because they lead you to understand your shoe requirements. Once you have completed this individualized survey, you'll know exactly which technical features you need in a pair of running shoes. Then, it's a relatively easy step to match the features you want to a shoe that fits the bill.