

THE NATURE AND INCIDENCE OF TRAUMATIC INJURY TO WOMEN IN SPORTS  
by Sharon Kosek, Division of Sports Medicine  
UNIVERSITY OF WASHINGTON, Seattle, Washington

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What are the five most common injuries that women receive in sports and with what frequency do they occur? This is a difficult question to answer as there have been very few articles written on injuries to women in sports; yet, it is important that we try to answer it. With the upsurge in women's participation in sports, a whole new field of interest has developed in terms of conditioning, injury prevention, and management. Women physical education instructors are demanding more training in this area. But before practical athletic training for women can be manifest in a college curriculum, there has to be an understanding of the nature of injuries women sustain in sports.

As an athletic trainer, certified by the National Athletic Trainers Association, I have worked on a two-year surveillance of injuries to women participating in intercollegiate competition at the University of Washington in Seattle. But before going into the details of my research, I would like to say a few words about the Division of Sports Medicine at the University of Washington for which I work.

The Division of Sports Medicine is directed by an orthopedic surgeon and is staffed by four certified athletic trainers, who are also registered physical therapists, four research athletic trainers and a statistician, and several orthopedic residents. The three major responsibilities of the Division of Sports Medicine are: 1) service 2) education, and 3) research.

The service responsibility consists of providing complete medical care for 750 male and 250 female athletes, 200 ballet dancers, and the university students referred from the student health service. The medical care consists of supervising conditioning programs, administering first aid, definitive treatment and rehabilitation. My position is that of women's athletic trainer, and I also act in the capacity of physical therapist for the university student body.

In the area of education, the staff teaches a course in athletic training in the Department of Physical Education. Workshops are given for the benefit of high school and college physical education instructors, nurses, and student athletic trainers; seminars are held for team physicians. Members of the staff supervise student athletic trainers, physical therapy students, medical students, and orthopedic residents.

Because the ultimate aim of the Division of Sports Medicine is injury prevention, research is carried out and results published or presented at national meetings. Research is made difficult due to the lack of published materials in the area of women's athletic injuries, hence, the problems are not well-defined.

During the past two years, women's injuries were studied for three competitive sports club teams. The three sports which were chosen for the greatest potential for injury were field hockey, basketball, and track and field. The five most common injuries occurring to women competing in those sports were



sprains, muscle strains, tendinitis, contusions, and patellar problems. Although the patellar or kneecap problem is specific to one area of the body, whereas the other types of injuries are not, we feel that this problem is in a category by itself.

A sprain may be defined as an injury to a ligament resulting from overstress which causes some degree of damage to the ligament fibers or their attachment. Sprains were seen most frequently at the ankle but commonly at the knee and fingers or thumb. Women in basketball were most often sidelined for sprained ankles.

A muscle strain, another common injury in women's sports, is an overstretching or overexertion of some part of the musculature, be it tendon, muscle fiber, or where the muscle joins tendon. Causes of muscle strains include lack of conditioning, lack of warm-up before vigorous activity, and musculature imbalance. Shin splints, which are ill-defined in most of the literature, are thought to be a strain or inflammation of a lower leg muscle. Muscle strains, including shin splints, were most often seen in track and field.

Tendinitis, particularly of the Achilles tendon, is an inflammation along the muscle, tendon, or in the tendon sheath surrounding the tendon. The cause is usually due to unaccustomed overuse, but may be due to a stretch-type injury, a direct blow or an infection which produces an irritation in the tendon or tendon sheath. It is seen commonly in women early in the season before they are adequately conditioned.

Women, particularly in track, suffer from an inflammation of the tendon of one or more muscles working across the ankle. Because the street shoes women wear have higher heels than the low built shoes in which they compete, the tendon is stretched farther than its accustomed length during athletic participation and becomes irritated.

The fifth common problem in women's sports involves the knee. However, it is not the torn cartilage often seen in men's sports but a problem involving the patella or kneecap. Women have a greater tendency towards subluxation or dislocation of the kneecap than do men for several reasons. Women have a wider pelvis which creates a knock-kneed tendency when running or when standing. The quadriceps muscle, which is the big muscle group on the front of the thigh, when contracting pulls from its attachment on the front of the shin to the hip. The line of pull passes to the outside of the patella rather than through its center as it usually does in men. The result is a kneecap which tries to drift laterally when the quadriceps muscles contract. You may think that all women must therefore have this "injury," but this is not so.

There are a few more predisposing factors. The patella slides in a groove between the condyles at the distal end of the femur. If the groove between the condyles is shallow or the lateral condyle is flattened, the patella has a greater tendency toward slipping laterally out of the groove each time the quadriceps muscles contract. Another factor is a



patella abnormally flattened on its undersurface which increases the possibility of subluxation or dislocation. Another cause of patellar problems may be due to a previous knee injury which was not fully rehabilitated. This may produce an asymmetrical pull of the quadriceps muscles creating a tendency for the patellar drift.

Another type of patellar problem common to college-aged women is the softening or degeneration of the undersurface of the patella. This is called chondromalacia and its patterns of development are similar in many respects to that of the dislocating or subluxing patella. It occurs in athletes and non-athletes, commonly in both knees. The difference between the athlete and the non-athlete would be that the athletes would continue to participate despite the pain, although favoring the knee, and the non-athlete would limit her activities to a tolerable level. Eventually both would have to be under the care of a physician, the athlete because she is at the point where the pain makes competition intolerable and the non-athlete because she has gradually favored her knee to the point where climbing stairs is out of the question.

How do women's injuries differ from the injuries sustained by men? Actually, a given injury is similar but the frequency patterns are different. Men are open for a greater number of injuries due to participation in body contact sports, such as football or wrestling. The incidence of head, neck, and upper extremity problems in women is very low for this reason. Women

do not compete on the rings in gymnastics, which is the apparatus contributing to a great number of shoulder problems in men's sports. Because there are a greater number of men participating in sports than women, the frequency of injury is deceiving. Men practice proportionately more times per week, have longer competitive seasons, and have more games per season. Therefore, it may seem that men have more injuries, but it is not truly comparable unless placed in the proper perspective.

Another variable factor influencing the injury statistics was the sports club philosophy under which the women's teams operated. Because all teams were open to all who would like to participate, the skill level on the average was low. Much of the season was devoted to teaching the sport. There was no cut-off point for accepting new members and latecomers missed the pre-season conditioning. Attendance was not mandatory. These facts, coupled with the knowledge that there were low numbers of participants, should hopefully put the low number of injuries in perspective.

An injury to be significant would prevent an athlete from fully participating in a sport. By definition, any athlete missing or not being able to participate fully in one or more practices or one game due to an injury sustained in that sport was counted in my injury study. Not included were those athletes who missed practice due to injuries sustained during other forms of recreational activities or illness.

In field hockey there were 3 significant injuries one year



with an average of 17 participants and 7 injuries the next year with 19 participants. The average seasonal injury rate for field hockey over a two-year period was .28 injuries per participant for a season of 29.5 games and practices. There were 5 injuries in basketball one year with an average of 17 participants and 7 injuries the next year with 12 participants. The two-year average rate of injury of the basketball season was .44 injuries per participant for an average season of 34 games and practices.

In track and field there were 5 injuries one year and 8 injuries the next year with the number of participants being 9 and 8, respectively. The seasonal injury rate for track was much higher than the other two sports with an average of .78 injuries per participant for an average season of 31.5 meets and practices. These injury rates do not reflect the varying lengths of the seasons of these sports although they do take into account the number of participants.

A way to express these figures that would adjust for both would be to base the rate upon the number of injuries per 10 participants per 100 exposures which would approximate 2 1/2 seasons. Using injury rates calculated in this manner, field hockey ranked low with 9 injuries and basketball was also low with 13 injuries. Track and field ranked high with an injury rate of 25. It is important to keep in mind that our injury information was based on rather few participants, and hence, relatively few injuries as well. Therefore, these injury rates, while reasonable estimates, should be expected to

to vary from year to year and from place to place.

In summary, the five most common injuries seen in women's sports at the University of Washington in field hockey, basketball, and track and field were: sprains, strains, tendinitis, contusions, and patellar problems. Because women are not involved in true contact sports, there are seemingly fewer time-loss injuries than for men. A comparison of the incidence of injury in men's and women's sports can be made based on the number of injuries per participant per amount of exposure time. However, one must take into consideration the skill level of the athletes and the amount of time spent in pre-season and off-season conditioning.

Because it appears that the incidence of injury in track and field is higher than in basketball or field hockey, greater effort is being made to establish a pre-season conditioning program for track to reduce the number of time-loss injuries due to strained muscles and tendinitis at the University of Washington. Other women's teams, such as tennis, crew and basketball are initiating pre-season conditioning programs with good results. This is one step towards prevention of injuries supported by the results of the two-year injury surveillance study. It is my hope that more research will be done in this area and that sports on the whole will become safer for the participants.