

ACL

PROTECTION AND PERFORMANCE ENHANCEMENT FOR AGILITY HANDLERS, PART 1

By Barbara Fink, Anita Keetch, and Denise Apperson

This is a fact: the incidence of ACL tears in female athletes participating in jumping and cutting sports is 2 to 6 times higher than in male athletes in the same sports.^{1,3,5}

Most of you are thinking, so what? You may be thinking, I am in the ring at most 40-50 seconds, I'm not a professional athlete, and this doesn't apply to me. You should know, however, that numerous studies have identified the particular movements that cause the most stress to the ACL and that are most commonly associated with injury:

- Quick stops
- Plant and cuts
- Pivots
- Quick changes of direction.

The ACL (anterior cruciate ligament) is a major stabilizer of your knee joint. Agility competitors perform these same high-risk movements every single time we run an exercise in class or our backyards, or a full course at a trial.

But, you may still argue, I am not a professional athlete. Other studies have shown that the lower skill and fitness levels typically associated with recreational athletes are related to a higher incidence of ACL injuries^{6,9}. Thus, it is the part-time athlete who has a higher risk of an ACL injury. For most of us, agility is a part-time activity, although one that we devote considerable time and resources to.

The results of a *Clean Run* demographic survey reported in the January 2004 issue help us define the average handler. You are female, between the ages of 31 and 60, and have been doing agility for more than four years. The average agility handler faces a significant risk of an ACL injury every time she trains or competes because she is female, because she repeatedly performs the movements that predispose her to injury, and because she engages in these activities in a recreational manner.

The Olympic sprinter whose race may last less than 30 seconds spends hours every day training and preparing for that event. How many hours a week do you spend training your dog? You put in considerable time and effort to prepare your dog for that 40- to 50-second run in the ring, so why not spend some time preparing yourself? You might think of your dog as the only athlete on your agility team, but for you to succeed at this





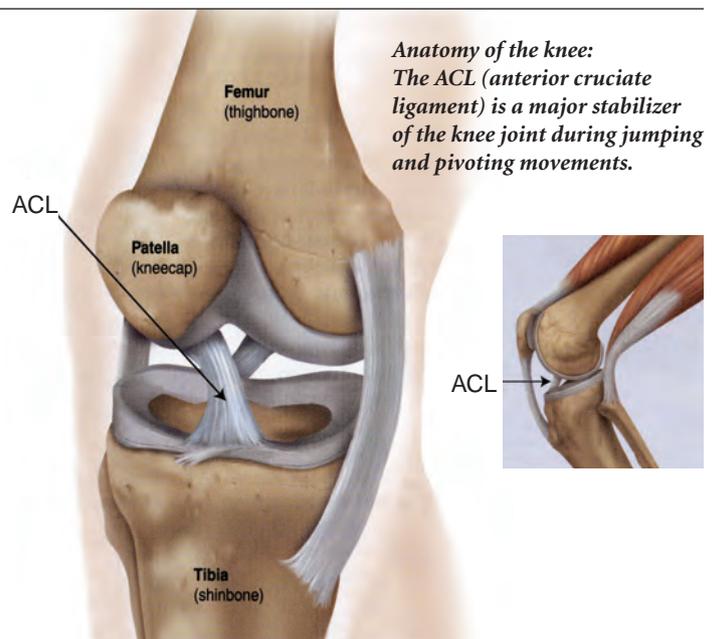
sport, you need to think of yourself as an athlete, too. Your physical fitness is a means to the end of playing the game of agility. In addition, improving your fitness can decrease your risk of injury, and importantly, improve your mental game by decreasing stress. All of these apply directly to your primary goal of success in the ring.

Some handlers may already have a cardiovascular training program (running, bicycling, swimming), and some may do weight training or other strengthening programs. While these activities certainly boost your overall performance, they do not specifically address ways to protect your ACL. If you already have a fitness program, you can easily substitute some of the exercises we recommend into that routine.

For those who may not already have a cardiovascular and strength training routine, you can incorporate an ACL program into your regular agility training and trialing routines. We are asking you to consider changing your habits, altering some of the routines you already have, in order to incorporate some ACL-specific exercises to help you avoid injury and improve your performance.

THE ACL

The anterior cruciate ligament (ACL) is the major stabilizer of the knee joint as shown in the diagram. Injury to this ligament is common during vigorous activities and sports. Unlike other ligaments in the body that more often partially tear and then scar to heal, the ACL typically completely ruptures and is no longer viable. Although many people can function in daily life without an ACL, they cannot usually return to competitive sports like basketball, soccer, skiing, or agility without one. The injured athlete is faced with a choice of giving up her sport or undergoing surgical reconstruction of the ACL. If she chooses surgery, it generally takes at least six months, including surgery and rehabilitation, to return to sport participation. Regardless of whether the individual chooses reconstruction or not, there are long-term implications for the knee joint when the ACL is





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torn: trauma such as tearing the ACL has been shown to initiate osteoarthritis.² The physical, emotional, and financial impact of this injury are substantial. Rehabilitation is possible after such an injury, but prevention is a much better goal. Once an injury occurs, it is also important to prevent re-injury of the affected knee or a new injury to the other knee.

ACL INJURIES IN THE AGILITY COMMUNITY

With the help of Clean Run, we distributed a survey among Clean Run's internet discussion group participants in order to examine the prevalence of ACL injuries in the agility community. The results of our survey can be directly compared to studies of other populations of women athletes participating in volleyball, soccer, and basketball and will provide the basis for further research by sports medicine professionals.

We received a total of 287 responses to our survey, of which 271 (94%) were from women, and 16 (6%) were from men. The mean age of all respondents was 48 years. When asked if they had a knee injury that affected training and competing with their dog, 161 (56%) respondents replied yes, and 126 (44%) replied no. Of those with knee injuries, 158 (98%) were women.

We found that less than half of our survey respondents already engage in more than a light exercise program. Here is a breakdown of the replies we received on exercise frequency:

- 53 (19%) Not at all
- 39 (14%) Minimal (0 to 30 min/wk)
- 75 (26%) Light (30 min to 1 hr 30 min/wk)
- 87 (30%) Moderate (1 hr 30 min to 3 hrs/wk)
- 32 (11%) Intense (more than 3 hrs/wk)
- One respondent did not answer this question.

The remaining questions in the survey applied only to the 161 respondents with knee injuries. Half of these handlers reported having more than one knee injury. The median age of handlers when they injured their knees was 40 years, and most of the 161 handlers have continued to compete in dog sports. Out of those with knee injuries, 85 handlers (53%) said they were training or competing in agility at the time of injury. Ten of these specifically implicated the front-cross maneuver. Four respondents injured their knees doing conformation handling.

The survey respondents reported 40 incidents of ACL tears and 73 incidents of meniscus damage. Some handlers had multiple episodes of injury resulting in more than one ACL-tear event, and some handlers with both ACL tears and meniscus damage experienced these injuries at different times. Yet about half of the ACL tears were accompanied by meniscus damage in the same incident, a result which is supported by clinical observations.

We were interested in the specific action that the handler was engaged in at the time of injury. Fourteen handlers (8%) reported that their injuries resulted from contact with their own dog. Others identified pivot, quick change of direction, plant and cut, quick stop, stepping into a hole, and tripping. Thirty-seven handlers (23%) noted that their knee collapsed inward, and 48 (30%) reported that their knee was hyperextended.

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Seventy-four handlers (46%) had surgery, some of them more than once. Eighty-nine handlers (55%) compete and train with a knee brace. *An astonishing 114 handlers (71%) compete and train with knee pain!*

As we proposed at the beginning of this article, female agility handlers could be held up as poster examples for knee injuries. Most of the handlers reporting knee injuries are women, and most of their injuries occurred as a result of our engaging in high-risk movements known to stress the ACL. Most of us are recreational athletes without regular exercise programs. Nearly all of those with knee injuries continue to train and trial with knee pain. We are at significant risk for new and repeated injuries.



PHOTO BY AUSSA BEHNPET PERSONALITIES

THE SOURCE OF GENDER BIAS IN ACL INJURIES

Much research has been conducted around the world in recent years to try to identify why the incidence of ACL injuries is so much higher in females and whether it can be decreased. Physicians, physical therapists, athletic trainers, and scientists specializing in the areas of biomechanics, motor control, and neuromuscular function have held several conferences to analyze the factors associated with the gender bias in non-contact ACL injuries. Each conference produced a consensus statement describing “what we know” about female athletes and their ACL injuries based on the current literature.

These experts have identified four important factors that affect ACL injuries in women athletes: structural, hormonal, neuromuscular, and biomechanical.² Structural factors include the structure of our pelvis and thigh bones and internal joint angles. Hormonal factors include effects of menstrual cycle on joint elasticity. Neither of these factors can be easily altered. Neuromuscular and biomechanical factors are associated with how we use our muscles and how we move. Examples of these

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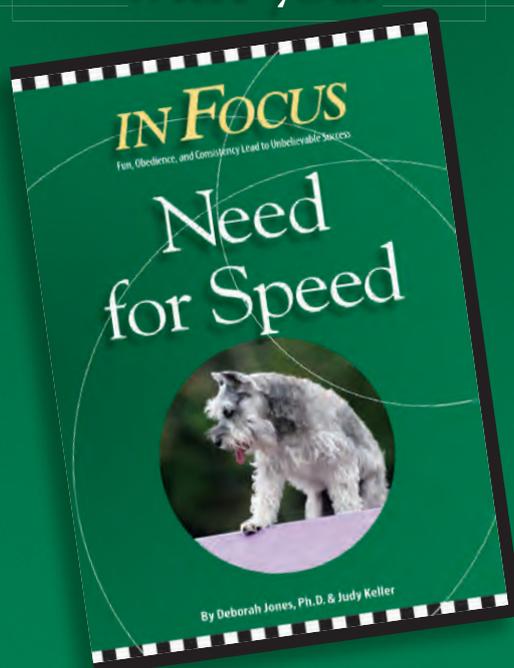
Have a dog that doesn't show
as much enthusiasm about doing agility
as you would like him to?

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include females relying more on their quadriceps than males to stabilize their knees, and when jumping and pivoting, females tend to land with their knees more folded inward than males. These behaviors can most definitely be changed and are the focus of ACL protection exercise programs.

PROGRAM OVERVIEW

There is now good evidence that carefully designed programs for protecting the ACL have successfully decreased the incidence of ACL tears in female athletes by up to 88%.^{5,7,8} ACL protection programs are still relatively uncommon, but one is currently operated by the University of Utah Sports Medicine Center. This program forms the basis for the modified ACL protection program for agility handlers that we describe. The University of Utah Sports Medicine Center ACL Protection Program for female athletes is based on three other successful and well-researched ACL protection programs from different areas around the world and on the consensus statements from the most recent research retreats described above.^{5,7,8,4,5} Input was received from physicians, physical therapists, athletic trainers, and coaches at the University of Utah. Optimum performance enhancement requires an athlete to engage in the full program under the supervision of a professional who is knowledgeable in the program. In this article, however, we offer agility competitors a safe and effective program based on selected components that you should be able to do on your own. If you do not currently participate in a regular exercise or fitness program, any questions or concerns that you might have about engaging in such a program should be directed to your doctor.

Our modified ACL program should take approximately 20 minutes to complete. Ideally, it should be done three times a week. We want to emphasize that you do not need to find a full hour every week in your already busy schedule to successfully apply the modified program. You should be able to work the ACL protection exercises into your existing routine by substituting them for exercises you are already doing, or by changing some of your habits to build new training and trialing routines that should not take much additional time. The ACL protection program complements your existing cardiovascular and overall

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strengthening fitness programs but does not replace them. If you want to run those 40-50 second sprints faster, you need a cardiovascular fitness program. If you want to run them with a lower risk of injury and improved stability during high-risk movements, then you also need the ACL protection program.

We have specifically designed this modified ACL protection program so that you can use it at home, at class, and at trials. You won't need any specialized equipment other than typical items you would have available at home and at a trial. It is divided into modules that can be done in the blocks of time you have before and after walking the course, while you warm up your dog, and before you go in the ring. And don't forget your dog! Most of us have regular warm-up and cool-down routines for our dogs. Our program can be smoothly integrated with your dog's existing routine.

You don't need to become an elite athlete, but we believe that you can become a better member of your agility team by giving some attention to your own fitness. Exercising to protect your ACLs and strengthen your legs will lead to better performance in the ring, a reduced risk of injury, and a stronger mental game. In the next article, we describe an ACL protection program with specific exercises designed for agility handlers. The program will provide benefits for all agility handlers, male and female, part-time and world-class. The 20-minute program represents a small investment of time with large potential gains. 🐾

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Barbara Fink, PT, DPT, OCS, is a physical therapist at the University of Utah Sports Medicine Center, and the program director for the University of Utah's ACL protection program. She has a special interest in injury prevention and sports performance for female athletes. For more information on the complete U of U ACL protection program, contact Barbara at Barbara.fink@hsc.utah.edu.

Anita Keetch, MS, ATC, has been a certified athletic trainer for 17 years in the Salt Lake City Area in Utah. As an independent consultant, she has trained and advised recreational, high school, and collegiate athletes on injury prevention and rehabilitation.

Denise Apperson, Ph.D., lives in Austin, Texas, with five Smooth Fox Terriers and three cats. She competes in agility, flyball, and conformation. She tore her right ACL at her first agility trial in 2002, and had surgery later that year. She trained and trialed with knee pain for over a year until she incorporated the ACL protection exercises into her routines.

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