How to avoid knee injuries this winter

Depending on the sport or activity, one can either strengthen core stability or engage in plyometric exercises

DWIGHT CHAPIN
HEALTH ADVISOR

Before tackling any winter sports this season, give some thought to protecting yourself from knee injuries.

Damaging the ACL, or anterior cruciate ligament, is one of the most common knee injuries. With a sudden, acute injury – which can be caused by a sudden change of direction combined with a quick stop or landing awkwardly from a jump or pivoting with the knee nearly fully extended with the foot planted on the ground – patients commonly report hearing a pop followed by the knee giving out. The joint then quickly swells and is often too painful or unstable to even bear weight.

The ACL is one of the four main ligaments within your knee that connects the thigh bone (femur) to the lower leg (tibia). Its job is to provide the knee with stability by preventing forward movement of the tibia off the femur, keeping the knee joint intact when acting as a hinge. It also helps to prevent hyperextension of the knee, which is particularly important to athletes who participate in activities that involve quick changes of direction, jumping and rapid deceleration.

Why some individuals are at greater risk for the injury than others is still not thoroughly understood, according to Dr. Rick Zarnett, division head of orthopedic surgery at Humber River Hospital; he is also orthopedic consultant to the National Hockey League Players' Association and head physician for the Toronto Argonauts football team.

For winter sports such as alpine skiing, use a wobble board or bosu ball in strength-training workouts to challenge your core strength and minimize the risk of an ACL injury. JOHN LEHMANN/THE GLOBE AND MAIL

Several studies have shown female athletes have a higher incidence of ACL injury than males. This may be because of differences in physical conditioning, muscular strength and neuromuscular control. Other suggested causes include differences in pelvis and lower-leg alignment, increased looseness in ligaments and the effects of estrogen on ligament properties.

ACL injury and its subsequent surgical correction are one of the most researched subjects in sports medicine. A recent review by the Orthopaedic Journal of Sports Medicine provided three key findings that could help you protect your knees.

1. Non-contact ACL injuries are commonly caused by a force coming at the knee from a variety of directions when the knee lacks dynamic joint stability. When testing jumping, squatting, stepping down, cutting and hopping movements, the research supports the importance of incorporating unplanned or unpredictable demands in injury-prevention training programs.

To prepare for alpine skiing, hockey, ice skating or snowshoeing, include exercises that challenge your core stability. Use a wobble board or bosu ball in your strength-training workouts. Walking or hiking on uneven surfaces is another way to introduce unplanned movements to your workout. Practise jumping, landing, stopping and moving with your knees over your feet. When doing these movements, it's important that your knees do not collapse inward. The way to prevent this kind of collapse is to make sure you are strengthening your hips and thighs as part of your training.

2. Professional athletes, including those involved in football, basketball, soccer, rugby, skiing, handball, volleyball and dancing, have a greater rate of ACL injury likely owing to increased exposure to intense training and more frequent competition. More research is also required to better understand the impact that fatigue has on ACL injury.

Parents commonly ask how much training is too much when it comes to their children playing a sport competitively. ACL tears in young patients, who have not yet reached skeletal maturity, can be tricky to manage. To reduce the risk of most sports injuries, younger athletes are encouraged to participate in a variety of different sports with a period of rest in between seasons.

3. Research has also shown that prevention programs that include both preseason and in-season training play an important role in reducing ACL injury.

Plyometric exercises such as jumping, which pushes muscles to exert a maximum force in a short interval of time, are important to injury prevention. A combination of plyometrics, strength training and balance work have been shown to reduce injury risk. This achieves better results when performed under supervision, for longer than six weeks, with at least one training session a week.

This type of program also shows a greater preventive effect in participants younger than 18 years, which suggests young athletes should incorporate this training in their preparation for sport.

Dr. Dwight Chapin, B.Sc(H)., D.C., is the clinic director of High Point Wellness Centre in Mississauga, team chiropractor for the CFL's Toronto Argonauts and on-site clinician for employees of The Globe and Mail. Follow him on Twitter: @HighPtWellness.

NUTRITION

Can you get too much protein?

RONI CARYN RABIN

Protein has achieved a venerated status in the dietary world for everything from building muscle to preventing weight gain. But can you get too much of a good thing?

Protein powders that come in chocolate, strawberry and cookies-and-cream flavours are doled out by the scoopful and mixed into smoothies, making it possible to effortlessly consume protein in amounts that far exceed dietary recommendations. A canned protein drink can contain almost as much protein as an eight-ounce (227-gram) steak, and snack bars or a small bag of protein chips can pack more of the macronutrient than a three-egg omelette.

But while some nutritionists have encouraged the protein craze, a number of experts are urging caution. They point out that protein powders and supplements, which come from animal products such as whey and casein or from plants such as soy, rice, pea or hemp, are a relatively new invention. The vast majority of Americans already get more than the recommended daily amounts of protein from food, they say, and there are no rigorous long-term studies to tell us how much protein is too much.

"It's an experiment," said Dr. John Swartzberg, chairman of the editorial board of the University of California, Berkeley, Wellness Letter. "No one can tell you the long-term effects and that's what worries me as a physician. No one can tell you what the results are going to be in people's bodies 10 or 15 years later."

People need sufficient protein in their diet because it supplies indispensable amino acids that our bodies cannot synthesize on their own. Together, they provide the essential building blocks used to make and maintain muscle, bone, skin and other tissues and an array of vital hormones and enzymes.

But the average adult can achieve the recommended intake – 46 g of protein a day for women, and 56 g for men – by eating moderate amounts of protein-rich foods such as meat, fish, dairy products, beans or nuts every day. There are about 44 g of protein in a cup of chopped chicken, 20 g in a cup of tofu or serving of Greek yogurt and 18 g in a cup of lentils or three eggs.

The relatively recent advent of protein-supplement drinks is helping people boost the intake level of the macronutrient, but little is known about the long-term effects of having too much protein. GETTY IMAGES/ISTOCK

American men already consume much greater amounts, averaging nearly 100 g of protein a day, according to a 2015 analysis of the 2007-10 U.S. National Health and Nutrition Examination Survey.

Among the groups that fall short on protein intake are teenage girls, who may not eat properly, and elderly people, who are at risk of losing muscle mass and whose appetites often slacken with age. Indeed, many of the earliest nutritional-supplement products, such as Boost and Ensure, were devised with the elderly and malnourished in mind. (Professional athletes who work out many hours a day also need to increase protein intake considerably, as do women who are pregnant or breastfeeding.)

Yet, the protein-supplement market is booming among the young and healthy, with retail sales of sports-nutrition protein powders and other products in the United States alone projected to reach $9-billion (U.S.) by 2020, up from about $6.6-billion last year, according to the research firm Euromonitor International.

"People think carbs are the enemy, protein is your friend," said Eleanor Dwyer, a research analyst with the firm, and "that any health concerns are overblown."

Experts note, however, that there is only so much protein the body can use. "The body only digests and absorbs a certain amount of protein at every meal," about 20 g to 40 g, said Jim White, a registered dietitian and exercise physiologist who spoke on behalf of the Academy of Nutrition and Dietetics.

"You can eat 300 g of protein a day, but that doesn't mean you'll put on more muscle than someone who takes in 120 g a day," White said. Meanwhile, "you're robbing yourself of other macronutrients that the body needs, like whole grains, fats and fruits and vegetables."

Short-term studies suggest high-protein, low-carbohydrate diets may promote weight loss and help to preserve lean muscle, and that eating protein helps satisfy hunger. But a recent small trial found older women who lost weight on a high-protein diet did not experience one of the important benefits that usually follow weight loss, an improvement in insulin sensitivity, which reduces the risk of developing Type-2 diabetes. Large population studies also suggest an association between habitual high protein intake and a heightened risk of diabetes.

Doctors also have concerns about the long-term effects of maintaining a high-protein diet. Studies show protein-rich diets do not preserve muscle mass over the long term, and doctors have long cautioned a high-protein diet can lead to kidney damage in those who harbour silent kidney disease by putting extra strain on the kidneys.

Furthermore, some researchers worry the muscle-building properties consumers seek in protein may be a double-edged sword, perhaps even leading to an increased risk of cancer.

Skeptics dismiss these concerns as speculative, saying they are not supported by adequate evidence. And some nutritionists advise adults to consume twice as much protein as currently recommended.

"There is a distinction between what is absolutely minimally required and a more optimal intake level," said Dr. Stuart Phillips, a professor of kinesiology at McMaster University in Hamilton, whose research has been supported by trade groups such as the U.S. National Dairy Council and the U.S. National Cattlemen's Beef Association.

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