BRACE YOURSELF

New hope for healing one of the most common—and catastrophic—injuries in sports.

BY ANDREW HEFFERNAN, CSCS

EVEN IF YOU'D rather watch sports than play them, you probably know that the anterior cruciate ligament—a half-inch-wide ribbon of collagen fibers connecting your thigh and shinbones—is the china vase of connective tissue: easy to break, notoriously hard to repair.

"We were always taught ACLs can't possibly heal," says Australia-based sports physician Tom Cross, MBBS. "That if you want to go back to pivoting sports, you have to have a reconstruction"—a painstaking procedure in which a surgeon builds you a new ACL from a graft. The only alternative: close to a year of rehab, in the hope that you'll be able to compensate for the injured ligament with muscle and strength and control.

In 2014, however, a series of coincidences led Dr. Cross and his father, Merv—a pioneering orthopedic knee surgeon who died in 2023—to test-drive a third path.

Back then, Dr. Cross was treating a 19-year-old athlete who'd ruptured her ACL playing netball. Coincidence number one: Merv, two years retired, happened to be a patient at his son's clinic that day. Coincidence number two: Merv had been mulling over an idea for nonsurgical ACL repair. Coincidence number three: Through an exam-room curtain, he overheard the athlete tell his son she was willing to try anything to avoid surgery.

It's likely Merv's theory would have remained untested had it not been for coincidence number four: The athlete was a longtime patient and the daughter of one of the clinic's staff. She might be open to trying out a new, left-field treatment.

In a twist worthy of *The Pitt,* Merv flung open the curtain. His proposal: Put the woman in a brace that kept her knee bent to 90 degrees. After four weeks, gradually straighten the brace. Repeat the process about every two weeks, and after a total of 12 weeks, he believed, the ACL would be healing on its own. Without surgical repair first.

"When you bend the knee, you bring the attachments of the ACL closer together," explains Dr. Cross. Held stationary, the doctors hoped, the two ends of the ACL might find each other and reconnect, like the two ends of a broken bone. Assured that she could still opt for

BAUERFEIND SECUTEC GENU, MODIFIED FOR CBP. COURTESY OF VENDOR.

PHOTOGRAPH BY **JOE LINGEMAN**

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surgery if the treatment didn't work, the young woman agreed to try the brace.

For Merv, who had spent 40 years as a surgeon, the theory was equal parts humble and audacious. Still, both doctors believed it had merit. Over decades, they'd seen documented cases in which ACLs appeared to reattach naturally. "It was an enigma," says Dr. Cross. Perhaps healings like these occurred in people whose sedentary job kept their knees bent most hours of the day. Could a similar result be achieved with a brace?

Twelve weeks later, they had an answer. "I'll never forget examining her knee," says Dr. Cross. She'd had no ACL endpoint. "And then, there was one. And the MRI showed that it healed." Nature had done the work for them.

Not sure if the healing might be a fluke, Dr. Cross waited two years before trying the technique on a family friend—a giant of a man who'd ruptured his ACL, along with his medial cruciate ligament, playing rugby. The brace worked again; both ligaments healed.

As successes piled up, Dr. Cross gradually started offering the treatment—now called the Cross Bracing Protocol, or CBP—to more patients. There were failures. Some ACLs didn't heal; some suffered re-ruptures. Dr. Cross took some flak on social media and considered abandoning the treatment.

Instead, he dug into the accumulating data and refined the procedure, changing the angle or the duration of the bracing period. Patterns emerged that identified the best candidates for CBP, and he began turning some people away, including the most severely injured patients and those with injuries more than three weeks old. Of the roughly 3,000 ACL injuries he's seen since beginning the protocol, he's used CBP for just one-third of them. More than 1,100 patients later, the numbers are encouraging. Over half of the first 900 patients on CBP were well on their way to complete healing after three months; 97 percent had at least some healing. As for the re-rupture rate: It's at just 15 percent—a percentage on par with surgically repaired ACLs.

Dr. Cross is careful to emphasize that the rehab process after bracing is similar in duration (12 months) and intensity to postsurgical rehab. Yet there's no cutting into your leg for the graft, and no drilling into your bones to secure it.

Preventing the knee from moving for a prolonged period has potential complications, including muscle and bone loss and increased risk for blood clots. There's also potential for stiffness in the joint, which concerns Robert G. Marx, MD, an orthopedic surgeon specializing in knee surgery at the Hospital for Special Surgery in New York. "Immobilizing an acutely injured knee at 90 degrees for even a relatively brief period of time can lead to severe knee stiffness, which is difficult to fix," he says. When you can't straighten your knee, it means trouble with walking. Dr. Cross is aware of the risk of stiffness as well as that of blood clots, and as countermeasures, he prescribes physical therapy and anticoagulants. So far, he says, knee stiffness has been an issue only 1 percent of the time.

One of Dr. Cross's key takeaways from this work so far: Every ACL injury is unique—and treatment should be too. In the future, he'd like to see an ACL registry that helps health pros customize a bracing protocol for each patient. For now, though, CBP is gaining traction as a viable, and far more economical, alternative to surgery for a sizable percentage of ACL injuries. But not all of them.

Dr. Cross is clear that "there's still going to be a great need for surgery. We're all working towards the well-being of the patient. We should be delivering a balanced approach that's accurate, scientific, and gives the patient a lot of control," he adds. "That's where I hope medicine is going." ■

TWEAKED KNEE? HERE'S WHAT TO DO

Uh-oh. You felt—or heard—a pop in your knee, and now it's swollen and wobbly. Here's the 411 on what to do next.

ICE

▶ Get off your injured leg, elevate it as much as possible, and put a compression bandage on it. Ice for 10 to 15 minutes every three to four hours.

SEE A DOC...STAT

▶ Ideally, one who's familiar with ACL injury and the Cross Bracing Protocol. And hobble with haste: CBP works only when applied earlier than 21 days—ideally, earlier than 7—post-injury. And before the procedure, you'll need an MRI and an in-depth consultation with a physician who can walk you through all your surgical and nonsurgical options.

BEND YOUR KNEE

▶ To facilitate healing, keep your knee bent to 30 to 90 degrees as much as possible, so the ends of the ligament have a better chance of finding each other. If you have access to a physical therapist's brace, set it at that range, with 60 degrees' freedom of movement. Continue this until you consult a doctor about which treatment is best for you.

HAVE EXACTLY ONE EXAM

▶ The in-office (or on-field) test for a ruptured ACL involves a single, gentle tug on your shinbone. If the ACL is still partially intact, tugging too hard can cause further damage and even sabotage healing. If a gaggle of med students want a go at you, politely decline.

AVOID NSAIDS

▶ Aspirin, ibuprofen (Advil, Motrin), and many other over-the-counter nonsteroidal anti-inflammatory drugs are great when your head hurts. But more than 24 hours after the injury, swelling is your friend. "The increased blood supply and swelling of your knee will assist in your recovery," says Dr. Cross. In pain? Consult your doc about an alternative reliever.