

“Seeing the knee in a new dimension”

The text below is a translation of “Genou sous la Loupe” written by:

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When downhill skiers take a nasty fall at more than 100 km/h, their already hard-at-work knees are often the first to absorb the shock. A tear to the anterior cruciate ligament, the same injury sustained this winter by Quebec skiers François Bourque and Jean-Philippe Roy, is a common occurrence on the powdered slopes.

If athletes hit the hills too soon after an injury, they may be slower than usual out of the starting gate. A Quebec invention now allows them to target the best time to head back up the chair lift. Known as the KneeKG™, this knee assessment system was developed at the École de technologie supérieure (ÉTS) in Montréal.

“The KneeKG™ allows us to create a three-dimensional image of knee function,” explained Professor Jacques A. de Guise, Canada Research Chair in 3D Imaging and Biomedical Engineering at the ÉTS. “We developed a harness that allows us to attach electromagnetic and optical sensors around the knee. We can therefore get an accurate image of the movements of the tibia, femur and knee.” A biomedical engineering first.

“This technology does not replace traditional assessment, which focuses more on joint laxity, stability, strength and flexibility. It is instead a complementary tool,” noted Alexandre Fuentes, Clinical Director of the Emovi Knee Clinic, where 700 patients have already tried the KneeKG™. Orthopedic surgeons and physiotherapists also welcome this innovation.

A dozen Quebec skiers have already had a “signature” taken of their healthy knees. When injuries occur, specialists can use this signature as a point of comparison to help their clients regain optimum knee function, a service that can aid athletes from all disciplines. “With the KneeKG™, we can better focus rehabilitation and physiotherapy treatment. Even if it looks like the knee has healed, function may not be fully restored. Athletes can therefore postpone their return to competition or have their treatment changed.”

Last year, the Fonds de la recherche en santé du Québec named the KneeKG™ as one of 15 scientific breakthroughs with an impact on disease treatment, prevention and diagnosis or the organization of health care. “We help athletes, but we can also help direct patients to the right health professionals,” concluded Jacques A. de Guise.