Press release

Protecting knee joints
How performance analysis systems help to reduce injuries

Sindelfingen, October 2019

There are over one hundred joints in the human body. Our knee joints are subjected to the most extreme loads of all: just by walking, we place a load of 3.5 times our own body weight on them – and jumping increases the load to 24 times the body's weight. If the stress on the ligaments in our knee joints is too great, they can be overstretched or may even tear. It is a well-known fact that exercise and movement are the best ways to protect joints against wear. However, performance analysis systems can also help to reduce injuries.

Our knee joints are the largest joints in our body, and they are also subjected to the most stress. As the link between the shinbone and the kneecap or thighbone, our knee joints enable us to perform movements of many types such as walking, swimming, running and jumping. They ensure our stability by carrying a large part of our body's weight. "And that's what makes them so vulnerable to injuries," according to Florian Laborde, a biomechanics expert with the Kistler Group. "Sports such as soccer, basketball, ice hockey, volleyball and skiing are virtually bound to cause knee joint injuries. Even the smallest errors in movement can lead to a cruciate ligament rupture or damage to the meniscus."

Optimum overview of athletes' performance capabilities

Over the years, many international competitive athletes and sports clubs have placed their trust in the Quattro Jump performance analysis system from Kistler to prevent injuries such as these. Quattro Jump is a combination of a force plate equipped with sensors and special analytical software. It measures all the relevant performance parameters for the legs, helping athletes and their coaches not only to train at optimum level but also to avoid injuries. If measurements are taken more frequently, the system generates an optimum overview of each athlete's current performance capabilities. This allows better control of special training and regeneration phases, so athletes can achieve their individual development targets more quickly.

How the Böblingen waste management department prevents injuries

The waste management department in the district of Böblingen, Germany, also places its trust in Quattro Jump. Dr. Dietmar Laudien, the medical officer responsible for the department, explains: "We have about eighty people working on garbage collection in Böblingen district at present. They cover long distances throughout the day, and they move many tonnes of garbage." Climbing or jumping on
and off the footboard at the back of the truck is also part of their everyday routine. And this is exactly where Dr. Laudien wants to intervene by taking preventive action: "Very often, our colleagues simply jump off the footboard without thinking about the long-term consequences. They don't realize that a jump from a height of just a few centimeters can already cause a massive increase in the forces acting on their joints."

This is why Laudien arranges regular instruction sessions for the garbage collection teams – at least once per year – to focus attention on the risks. "I believe it's important to raise awareness among our colleagues who collect the garbage. Thanks to the force plate from Kistler, I can clearly show them the difference between the force that acts if they jump off the footboard, and the force applied if they step down more slowly. Our colleagues are often visibly shocked to learn the true facts – and that makes them think deeply about the risks," Laudien concludes.

**Image material (please name the Kistler Group as picture source)**

Our knee joints are the largest joints in our body, and they are also subjected to the most stress. Just by walking, we place a load of 3.5 times our own body weight on them – and jumping increases the load to 24 times the body's weight. This is why the risk of injuries is so great.

Sports such as soccer, basketball, volleyball, ice hockey and skiing are virtually bound to cause knee joint injuries.
A massive increase in the forces acting on the joints is caused by a jump from a height of just a few centimeters – from the footboard of a garbage collection truck, for example.

The Quattro Jump performance analysis system from Kistler measures all the relevant performance parameters for the legs, helping athletes and their coaches not only to train at optimum level but also to avoid injuries.

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