

What does KiRA quantify?

KiRA quantifies the acceleration of lateral compartment of tibia during pivot-shift test. The reduction of the lateral compartment, subluxed during the test, creates a jerk which is recognisable by KiRA. The bigger the jerk is, the bigger is the value measured by KiRA.

Is it an automatic\robotic test?

No. The pivot-shift test is performed manually by the physician. KiRA quantifies the manoeuvre performed by the physician. Even if the output is filtered, and the test has been demonstrated to be repeatable, the only variable that can influence the measure is the physician itself.

Is the skin positioning reliable, are there any artefacts?

Skin artefacts do not influence the test. Validation using bone-mounted markers has highlighted that the skin movement is negligible during the manoeuvre (<4mm) and it occurs mainly at 60° of flexion, when the pivot-shift has already ended. (Lopomo N, et al. KSSTA 2012)

Is it repeatable?

Intra-operator repeatability is >0.9 (Lopomo N, et al. CMMB 2012) Inter operator repeatability is >0.6 (Berruto M, et al. 2013 KSSTA Signorelli et al. EBS 2010). KiRA repeatability is comparable to other device used to quantify Lachman test (Berruto M, et al. KSSTA 2013)

Does anaesthesia influence the quantification of the test?

If the patient is relaxed and not actively contributing to the manoeuvre, tests done before and after anaesthesia indicate that the influence of an active patient is lower than 10% of the measured value (<0.2g for healthy and <0.4g ACL deficient knee) (Signorelli C, et al. EBS 2010).

Is the speed of the manoeuvre influencing the quantification of pivot-shift?

“High forces and extremes of rotation are not necessary to produce a clinical detectable pivot-shift” (Ahlden et al. 2012 KSSTA). Said that, test speed of force applied may bias the result. Aldhen et al evaluated the influence of high and low stress applied to the test. Some minor differences where noted, but clinically not so relevant ($2.5 \pm 0.6g$ measured with high stress test versus $2.3 \pm 0.5g$ measured with low stress,).

Best results are obtained if the test is performed using the standardization proposal of UPMC.

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