

## Robotsko merjene anteriorne laksnosti kolenskega sklepa

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**Uvod:** Anteriorna laksnost kolenskega sklepa je pri nepoškodovanem kolenu dejavnik tveganja za poškodbo sprednje križne vezi (1) in poškodbo kolena (2). Pri poškodovanem kolenu pa je indikator za poškodbo sprednje križne vezi (3, 4). Nov robotski artrometer za merjenje anteriorne laksnosti kolenskega sklepa kolenski artrometer GNRB<sup>®</sup> (GeNouRoB SAS, Montenay, France) ima nekatere prednosti v primerjavi z nerobotskim kolenskim artrometrom KT. Namen raziskave je bil ugotoviti zanesljivost posameznika pri uporabi kolenskega artrometra GNRB<sup>®</sup> in predstaviti normativne vrednosti anteriorne laksnosti kolena pri mladih preiskovankah z uporabo artrometra GNRB<sup>®</sup>. **Metode:** Anteriorna laksnost kolenskega sklepa je bila testirana pri 2 skupinah mladih, nepoškodovanih preiskovank. Med izvedbo testa smo spremljali EMG aktivnost zadnjih stegenskih mišic. Zanesljivost kolenskega artrometra GNRB<sup>®</sup> je bila testirana v skupini 13 preiskovank, zbiranje normativnih podatkov je potekalo v skupini 23 preiskovank. Anteriorna laksnost kolenskega sklepa (anteriorni odmik golenice) je bila izmerjena pri silah 134 N in 250 N. Rezultati so predstavljeni na nestandardiziran način (brez uporabe dodatne stabilizacije) in standardiziran način (z uporabo dodatne stabilizacije) upoštevajoč stabilizacijsko silo na pogačici. **Rezultati:** Relativna zanesljivost (95-odstotni interval zaupanja) kolenskega artrometra GNRB<sup>®</sup> je bila pri sili 134 N med 2 in 3 mm. Normativni podatki so pokazali, da je anteriorna laksnost levega kolena skoraj za 1 milimeter večja od desnega kolena. **Zaključki:** Relativna zanesljivost kolenskega artrometra GNRB<sup>®</sup> je primerljiva s KT kolenskim artrometrom. Kot ugotovljeno na nerobotskem kolenskem artrometru, je tudi pri robotskem artrometru GNRB<sup>®</sup> anteriorna laksnost kolenskega sklepa večja na levem kolenu v primerjavi z desnim kolenom.

**Ključne besede:** sprednja križna vez, EMG, sila, artrometer.

## Robotic testing of knee anterior laxity

**Background:** Anterior laxity is a risk factor for anterior cruciate ligament (1) and traumatic knee injuries (2), generally, in the uninjured knee. In the injured knee, it is indicative of anterior cruciate ligament injury (3, 4). A new knee ligament arthrometer for testing knee anterior laxity, the GNRB<sup>®</sup> knee arthrometer (GeNouRoB SAS, Montenay, France), has been developed and offers additional characteristics that may improve testing as compared to nonrobotic devices such as the KT. Purpose of the study was to evaluate the reliability of the GNRB<sup>®</sup> knee arthrometer and present normative values of knee anterior laxity using this device on young females. **Methods:** Knee anterior laxity in both knees was tested in two groups of young, uninjured females using the hamstrings electromyography biofeedback feature of the device. There were 13 participants in the group tested for reliability and 23 for the normative study. Knee anterior laxity (mm of movement of the tibia in the anterior direction) was calculated at test forces of 134 N and 250 N with values presented for the unstandardised and standardised (relative to stabilisation force) conditions. **Results:** The relative reliability (95 % limits of agreement) of the device for laxity at a test force of 134 N was 2 to 3 mm. Left knee anterior laxity was almost 1 mm greater than the right. **Conclusions:** The relative reliability of the GNRB<sup>®</sup> knee arthrometer is comparable to the KT device. In agreement with previous work on the nonrobotic KT arthrometer, the knee anterior laxity values found with the GNRB<sup>®</sup> knee arthrometer are greater in the left as compared to right knees.

**Keywords:** anterior cruciate ligament, electromyography, force, arthrometry.

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