**Knee Sleeve Integrated with Capacitive Strain Gauge to Measure Knee Joint Laxity due to ACL Injuries**

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**Abstract**

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Measuring knee joint laxity is crucial in orthopaedic assessment and rehabilitation. It aids in diagnosis, treatment planning, rehabilitation progress monitoring, and determining return-to-sport readiness. Existing methods for measuring knee joint laxity, such as manual tests like the Lachman test, anterior drawer test, pivot shift test, and instrumented methods like arthrometers, and stress radiography, have limitations including subjectivity, low sensitivity, invasiveness, and lack of real-time data. These limitations may affect the accuracy and reliability of measurements. A new approach using capacitive strain gauges shows promise due to their non-invasiveness, high sensitivity, real-time data acquisition, and potential for remote monitoring. Integrating Capacitive strain gauges into a wearable design like knee sleeves can be a portable, cost-effective approach and provide real-time and accurate measurements of knee joint laxity irrespective of the examiner's experience.

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**Keywords:** Knee joint laxity, Capacitive strain gauge, ACL injuries.