

# SUMMARY OF CAPROG STUDY

Evaluation of proprioceptive abilities  
when wearing an elastic orthosis in patients  
with proprioceptive knee deficits



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## What is proprioception?

Proprioception helps our bodies to locate itself in space and remain stable. Following a sensory stimulus, a signal is sent to the central nervous system, which triggers a motor response = muscle activation.

### This processus allows:

- The feeling of joint position,
- Kinaesthesia = detection of joint movement/acceleration,
- Reflexes.

### A proprioceptive deficit corresponds to:

A blockage of the sensory stimulus, which may result from an injury (e.g. ACL rupture, etc.) or a pathology (e.g. osteoarthritis, etc.).

## Protocol – Materials and Methods:

2 randomised conditions evaluated on 15 patients (9 men and 6 women, aged between 20 and 64) with a proprioceptive deficit of the knee (greater than 2.5° on the threshold of detection of passive movement):

- Without knee brace
- With GenuAction knee brace (Thuasne) – proprioceptive ASQUAL class 3.



For each condition, walking of 5 to 8 min on a treadmill, then realization of the tests in the following order:

1

### Bareesthesia evaluation (blindfolded):

skin sensitivity test with monofilaments of different diameters.



2

### Statesthesia evaluation (sensitivity to the joint position, blindfolded):

JPS test (Joint Position Segment) = autonomous reproduction of a defined position and error assessment.



3

### Functional proprioceptive evaluation (balance):

Y Balance Test (YBT) = while balancing on the deficient leg, the patient pushes 3 cleats as far as possible in 3 different directions. Assessment of the distance covered by the cleats (rationalized to the patient's leg length).



4

**Followed by a subjective evaluation:** Visual Analogue Scale (VAS).

NB: For the «Knee brace» condition, treadmill walking was carried out with the knee brace, but the subsequent tests were carried without the knee brace to avoid inducing mechanical bias.

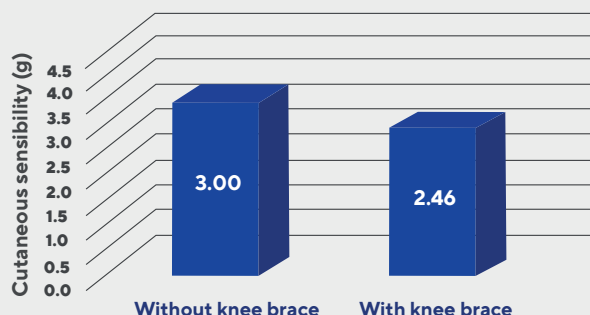
## Limitations/bias of the study:

Please note that this study cannot confirm/infirm the hypothesis that the results obtained on proprioception are linked to the compression of the device.

## Results:

### • Baresthesia evaluation

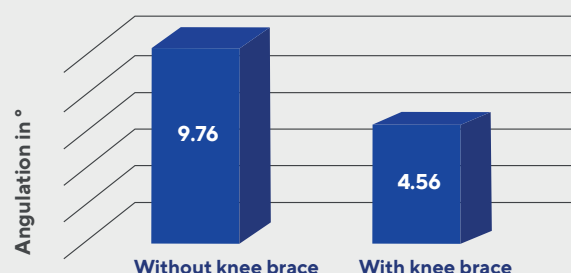
The sensitivity threshold was lowered by 18% ( $p < 0.001$ ) when wearing a knee brace.



→ Significant improvement in cutaneous sensitivity after wearing the knee brace.

### • Statesthesia evaluation

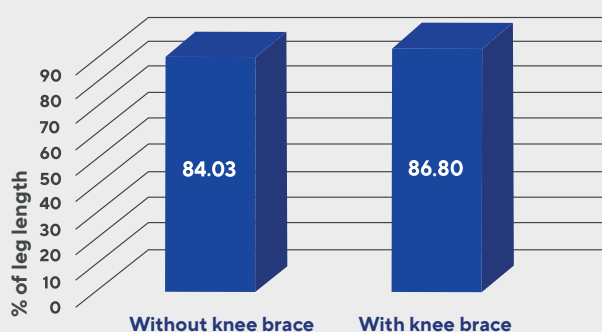
Positioning error when wearing the knee brace was divided by 2 ( $p < 0.001$ ).



→ Significant improvement in joint positioning.

### • Functional proprioceptive evaluation

Significant improvement of 3.2% ( $p < 0.001$ ) in the YBT score after wearing the knee brace compared with the no-knee brace condition.



→ Significant improvement in balance after wearing the knee brace.

### • Subjective evaluation

Significant improvement in static stability ( $p < 0.05$ ), dynamic stability ( $p < 0.05$ ) and discomfort when walking ( $p < 0.05$ ). No significant difference in fluidity or range of motion.

## Conclusion:

Wearing the GenuAction knee brace (for 10 to 15 min) significantly and immediately (up to 10 min after removal) improves knee proprioception in patients with proprioceptive deficits, compared with the condition without knee brace.

CAPROG study : Evaluation of proprioceptive abilities when wearing an elastic orthosis in patients with proprioceptive knee deficits. -2023 – 15 patients – n° ID-RCB 2022-A00676-37. Main objective: To compare, with or without wearing an elastic proprioceptive knee brace, the functional proprioceptive capacity of the knee in patients with proprioceptive deficits. GenuAction indications: Knee pain and/or swelling management, joint instability/laxity, proprioceptive support for rehabilitation, conservative treatment of mild knee ligament injuries, compression for scar/burns healing. Contraindications: refer to the leaflet. Class I medical device. Read the product's instructions for use, indications and contraindications carefully. Availability of this product might vary from a given country or region to another, as a result of specific local regulatory approval or clearance requirements for sale in such country or region. Medical device mentioned on this document is CE marked according to the European regulation 2017/745. Réf. : 2307266 (07 - 2023).

Photos: Studio Caterin, A2S - Illustrations: Thuasne.

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