



**THUASNE**

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## DO KNEE BRACES AFFECT MUSCULAR STRENGTH?

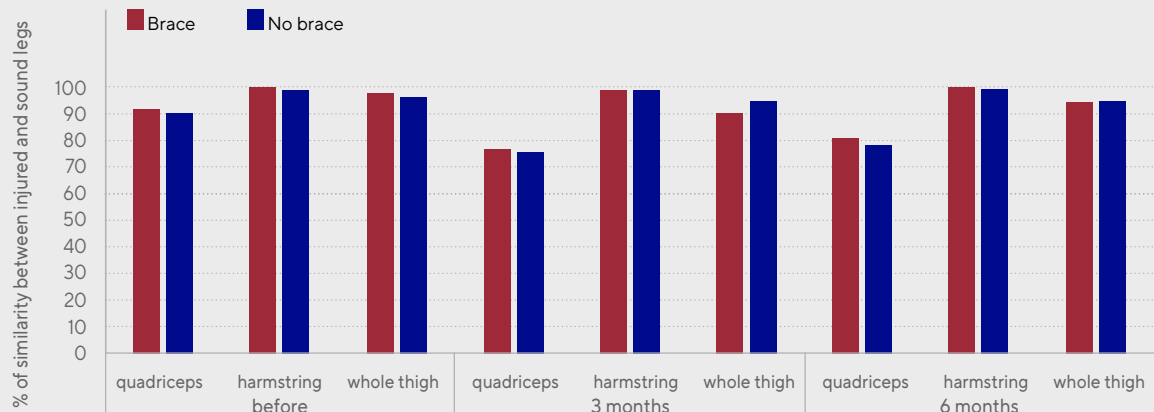
### **The cases of:**

- Ruptured ligaments
- Knee osteoarthritis
- Patellofemoral pain syndrome



# RUPTURED LIGAMENTS

In the study of Risberg<sup>(1)</sup>, a test was performed with a dynamometer<sup>(2)</sup> used to assess the knee muscle performance during flexion and extension to compare the injured leg with the sound leg. It shows that there is **no significant difference in muscle strength at 6 weeks, 3/6 months and 1- and 2- years follow up**, between a group that wore a rigid brace for 3 months and a group that wore no brace after ACL reconstruction.



Moreover, the isokinetic muscle torque measurements in Harilainen's study<sup>(3)</sup>, showed **no significant differences between the brace group (3 months of rehabilitative bracing) and the no-brace group at 6 weeks, 3 and 6 months and 1- and 2-years follow-up.**

## TAKE AWAY MESSAGE:

### NO ADVERSE EFFECT OF 3 MONTHS BRACING ON MUSCLE STRENGTH AFTER LIGAMENT INJURIES

- (1) May Arna Risberg, Inger Holm, Harald Steen, Jan Eriksson, and Arne Ekland "The effect of knee bracing after anterior cruciate ligament reconstruction: A prospective, randomized study with two years' follow-up" THE AMERICAN JOURNAL OF SPORTS MEDICINE, Vol. 27, No. 1 © 1999  
 (2) Cybex 6000 isokinetic  
 (3) A. Harilainen, J. Sandelin, "Post-operative use of knee brace in bone-tendon-bone patellar tendon anterior cruciate ligament reconstruction: 5-year follow-up results of a randomized prospective study", Scand J Med Sci Sports 2006; 16: 14-18

## THUASNE PRODUCTS AFTER LIGAMENT INJURIES

### MEDICAL INDICATIONS

- Conservative treatment of knee ligament injuries and/or ruptures (cruciate and/or lateral ligaments).
- Post-operative rehabilitation.
- Joint instability/laxity.



Rebel® Range

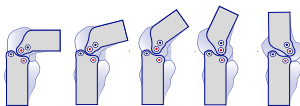


GenuPro Control

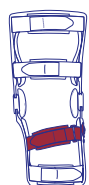


Genu Ligaflex® Range

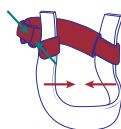
### TECHNICAL FEATURES



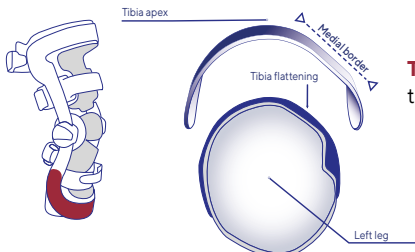
**TM5:** Ligament protection, prevent tibial instabilities<sup>(4)(5)</sup>. Roll-back and glide movement similar to natural movement<sup>(5)</sup>. No pistonning, no migration<sup>(4)</sup>.



Medial Lateral



**SYNERGISTIC SUSPENSION STRAP:** Better comfort<sup>(4)</sup> as the brace stays in place on the leg. Anterior-posterior (AP) + medio-lateral (ML) tightening (front/back and left/right). Asymmetrical attachment on the narrowest aspect of the leg.



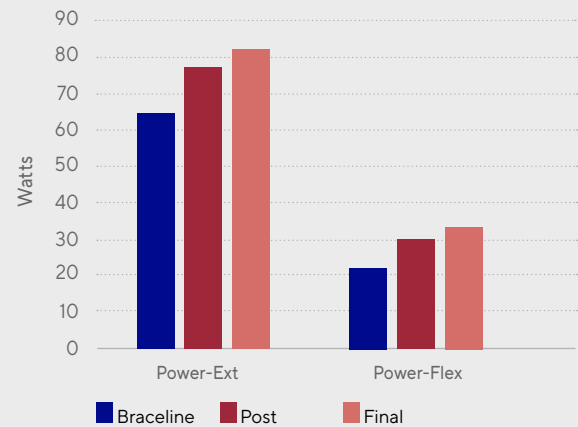
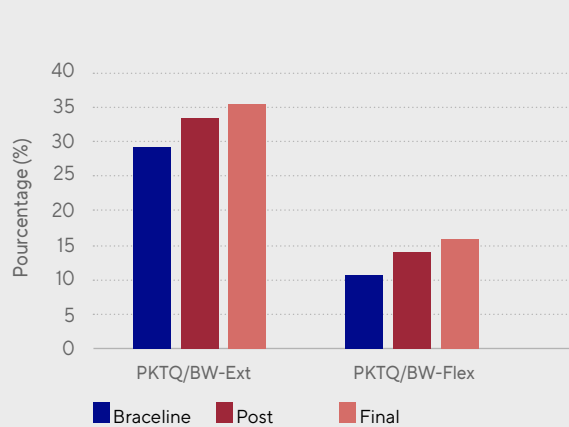
**TIBIAL BOLSTER:** Prevent rotation<sup>(4)</sup> and protect the ligaments<sup>(4)</sup>. Musculo-skeletal lock using the flat medial border of the tibia.

(4) Internal CE marking data.

(5) A2S biomechanical study « Biomechanical study of the stride during use of different braces » 2020, study carried out on the Rebel® Standard.

# KNEE OSTEOARTHRITIS

Lamberg's<sup>(6)</sup> study showed that patients with primary uni-compartmental knee osteoarthritis fitted with a Rebel Reliever® demonstrate an **increased in peak torque** normalized to body weight (PK TQ/BW) as well as **muscle power for knee extension and flexion** ( $p < 0.05$ ) after 8 weeks of bracing.



Furthermore, Callaghan<sup>(7)</sup> showed that a **patellofemoral flexible knee support** in participants with Patellofemoral osteoarthritis does **not have an adverse effect on quadriceps MVC (Maximum Voluntary Contraction) or AMI (Arthrogenic Muscle Inhibition)**. Indeed, MVC increased ( $p = 0.004$ ) in all the 108 participants that wore a brace for 12 weeks and AMI decreased ( $p < 0.001$ ).

## TAKE AWAY MESSAGE:

**NO ADVERSE EFFECT OF OFF-LOADING KNEE BRACES ON MUSCLE STRENGTH FOR OSTEOARTHRITIC PATIENTS**

- (6) Eric M. Lamberg, Robert Streb, Marc Werner, Ian J. Kremenic, James Penna, "Improvements in Function and Strength with Decompressive Bracing of the Osteoarthritic Knee" Volume 28 • Number 4 • 2016. The American Academy of Orthotists and Prosthetists  
 (7) MICHAEL J. CALLAGHAN, PhD, MPhil, MCSP1 • MATTHEW J. PARKES, MSc1 DAVID T. FELSON, MD, MPH1-346-01 Callaghan.indd. , "The Effect of Knee Braces on Quadriceps Strength and Inhibition in Subjects with Patellofemoral Osteoarthritis", Journal of Orthopaedic and sports physical therapy 46 (1): 19-25, 2015.

## THUASNE PRODUCTS FOR KNEE OSTEOARTHRITIS

### MEDICAL INDICATIONS



#### Rebel® Reliever

Patients with moderate to severe OA.  
 Conservative treatment of knee ligament injuries and/or ruptures (cruciate and/or lateral ligaments).



#### UniReliever™

Patients with moderate to severe OA.



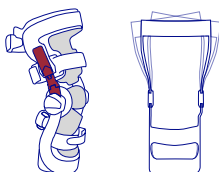
#### Action Reliever®

Patients with moderate to severe OA.

Joint instability/laxity. Alternative to osteotomy or leg misalignment surgery.

Symptomatic unicompartmental femorotibial osteoarthritis. Knee off-loading for post-traumatic, post-operative or degenerative conditions.

### TECHNICAL FEATURES



#### LOADSHIFTER - For Rebel Reliever®:

Mechanical unloading of the affected compartment<sup>(9)</sup> provided by a significant varus and valgus correction of the thigh shell. Averaged 36% reduction of force through the knee<sup>(10)</sup> leading to less pain, better function and clinical benefit<sup>(8)</sup>.

#### 3-POINT PRESSURE



#### DYNAMIC OFF-LOADING - For UniReliever™ and Action Reliever®:

3-point pressure system: application of corrective forces on the leg to reduce the load of the affected compartment. Non elastic straps creating a dynamic 3-point pressure system: maximum straps' tension in extension and so most effective on heel strike<sup>(8)</sup>.

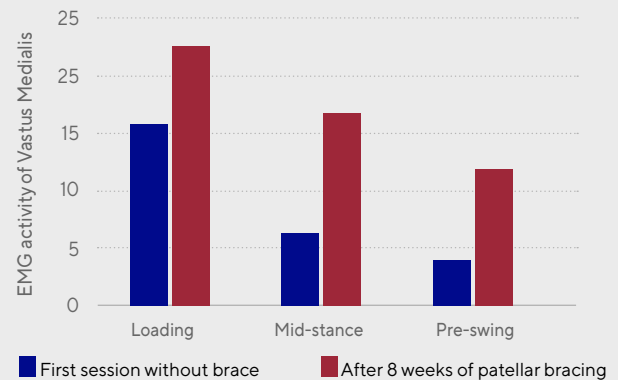
(8) Internal CE marking data.

(9) Thoumie, Philippe, Marc Marty, Bernard Avouac, Adeline Pallez, Arnaud Vaumousse, Linh Pham Thi Pipet, André Monroche, et al. 2018. "Effect of Unloading Brace Treatment on Pain and Function in Patients with Symptomatic Knee Osteoarthritis: The ROTOR Randomized Clinical Trial." Scientific Reports 8 (1): 10519.

(10) Lamberg, Eric M., Robert Streb, Marc Werner, Ian Kremenic, and James Penna. 2016b. "The 2-and 8-Week Effects of Decompressive Brace Use in People with Medial Compartment Knee Osteoarthritis." Prosthetics and Orthotics International 40 (4): 447-453.

# PATELLOFEMORAL PAIN SYNDROM

In the study of Salarie Sker<sup>(11)</sup>, the EMG activity of 6 leg's muscles in patients with patellofemoral pain syndrome were assessed before and after wearing a patellar brace for 8 weeks.



After 8 weeks of patellar bracing, EMG activity of Vastus Medialis muscle (a thigh muscle) was significantly higher when compared to first session without brace at mid-stance sub-phase ( $p=0.011$ ) as well as at pre-swing sub-phase ( $p = 0.013$ ).

## TAKE AWAY MESSAGE:

**NO ADVERSE EFFECT OF LONG-TERM WEARING OF PATELLAR BRACING ON MUSCLE STRENGTH IN PATIENTS WITH PATELLOFEMORAL PAIN SYNDROME**

(11) Fatemeh Salarie Sker, Mehrdad Anbarian, Amir H. Yazdani, Pouria Hesari, Arash Babaei-Ghazani, "Patellar bracing affects EMG activity of leg and thigh muscles during stance phase in patellofemoral pain syndrome" 2017, Gait & Posture (58), 7-12

## THUASNE PRODUCTS FOR KNEE PATELLOFEMORAL PAIN SYNDROME

### MEDICAL INDICATIONS



#### Patella Reliever

Femoro-patellar osteoarthritis (mild to moderate).  
Anterior knee or patella pain.  
Patellar instability.  
Patella luxation and subluxation.  
Abnormal patella displacement (patella alta).  
Patellofemoral pain syndrome and/or patella instability.  
Post-operative use (after Medial Patellofemoral Ligament reconstruction, lateral release).

### TECHNICAL FEATURES



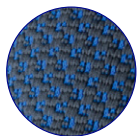
#### UNIQUE PATELLA INSERT:

Specifically designed to anchor to the patella:  
• anatomically shaped for an excellent fit to the patella edges,  
• asymmetrically shaped to avoid lateral malalignment.  
Directly on the skin to be the closest possible to the patella (no additional layer).



#### ADJUSTABLE MECHANISM:

Traction system in direct contact with the patella pad (no interface) = to position the patella insert around the patella.  
Quick adjustment all day long.



#### MEDICAL GRADE COMPRESSION:

Restores the proprioceptive message (body perception in the space).  
Promotes blood circulation to reduce pain and swelling.

### OVERALL CONCLUSION

Wearing a knee brace is intended to accompany the return to an active lifestyle, thus promoting increased physical activity carried out in safe conditions. Knee braces allow the patient to mobilize the affected joint, encouraging movements that mobilise the muscles properly, not immobilise it.

Availability of these products 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. Read the product's instructions for use, indications and contraindications carefully. The Medical Devices mentioned on this document are CE marked according to the European council regulation 2017/745. Ref.: 2305181 - (06 - 2023) - Photos: Studio Catherin, Illustrations: Thuasne.



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