enovis

THE OSTEOARTHRITIC KNEE

THE CLINICAL STORY OF EFFECTIVENESS FOR OA KNEE BRACING

MANAGING OA OF THE KNEE WITH DONJOY®

FACTS & FIGURES

Global prevalence of knee OA⁴





in 40+ age group



WITH AGING

populations and increasing rates of obesity and injury, the prevalence of osteoarthritis is expected to continue to increase.





suffer from knee OA



BRACES

and other assistive technologies can help people with osteoarthritis to **stay independent** when movement becomes more difficult (*WHO 2023 facts sheet*²⁸)

RISK FACTORS

Gender^{2,4}

Malalignment^{23,25}

Genetics^{1,27}

Obesity^{2,4}

Aging^{2,4}

Muscle Weakness^{18,22}

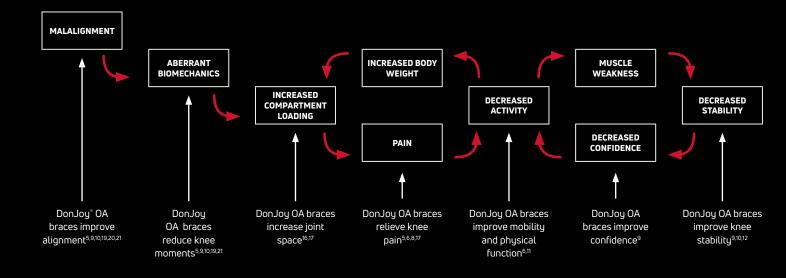
Previous Knee Injury/Trauma^{24,26}

Knee Overload^{2,3,28}

TREATMENT GAP

Approximately 20% of American patients with symptomatic knee OA linger in what's called a "treatment gap" for 10 years.¹⁴ During this treatment gap phase, offloader bracing is a cost-effective conservative treatment that can be utilized to aid in symptom relief.¹³

OA BRACING AS A SOLUTION



Push

Pull

DONJOY offers push or pull offloading technology options depending on the severity of the osteoarthritis, activity level, and other related needs of the patient.



INTRODUCING THE DONJOY ROAM™ OA

ROAM REDUCED KNEE ADDUCTION ANGLES IN MAJORITY OF PATIENTS.

Lower knee adduction angle led to a more balanced mediolateral load distribution.

Blue line shows joint moment and joint angle changes when ROAM is worn versus the gray line representing when no brace is applied. As indicated in the blue line, ROAM reduced knee adduction angles in majority of patients. Lower knee adduction angle led to a more balanced mediolateral load distribution.

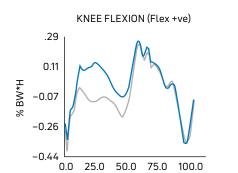
ROAM IMPROVED LOAD ACCEPTANCE AFTER HEEL STRIKE WHICH IMPROVED THE FLEXION-EXTENSION PATTERN FROM EARLY TO MIDSTANCE PHASES.

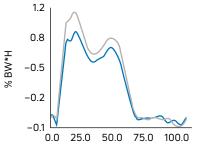
Healthier quadriceps use was suggested based on the increased flexion moments during the gait phase.

The blue lines in the knee flexion graphs show that ROAM improved load acceptance after heel strike which improved the flexion-extension pattern from early to midstance phases.



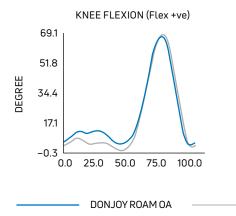
JOINT MOMENT (EXTERNAL)

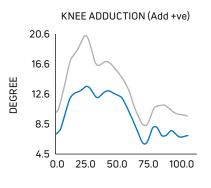




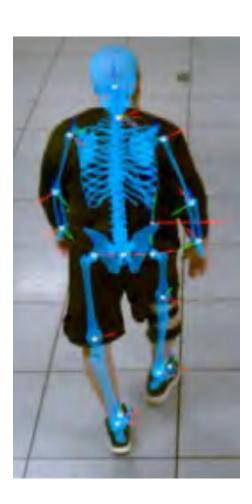
KNEE ADDUCTION (Add +ve)

JOINT ANGLES





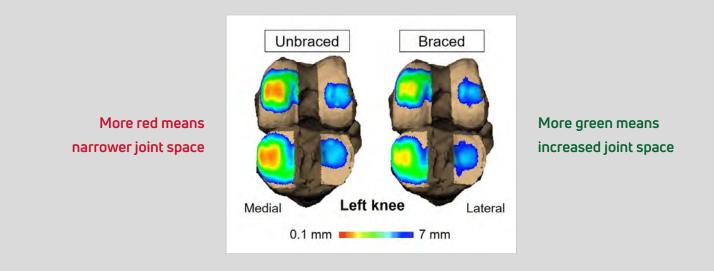
No Brace JOINT



EFFECTIVENESS OF DONJOY® OA BRACES

Increased Joint Space

DonJoy OA Defiance[®] brace can induce a significant increase (0.3 mm) in medial compartment dynamic joint space during gait in medial compartment knee OA patients¹⁷.



Increased dynamic joint space during gait with DonJoy[®] braces offloads the OA compartment¹⁷

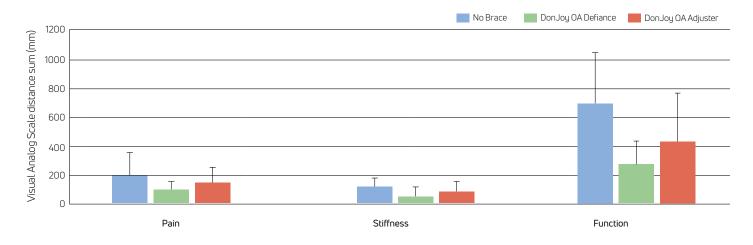
Improved Alignment and Stability

- DonJoy[®] OA braces effectively improve alignment by shifting the knee into a more valgus position in subjects with varus knees^{5,20} as well as in normally aligned subjects¹⁹.
- At approximately 10% of the gait, the point of greatest loading, the OA Adjuster brace produced the greatest corrective effect^{20,21}
- DonJoy[®] OA braces reduce peak knee adduction moment up to 32% during gait^{5,19,21} and stair stepping²⁹.



Pain Relief

- The DonJoy OA Adjuster[™] and OA Defiance[®] lead to significant pain relief at rest and during activity and improve symptoms of stiffness and function^{5,6,8,9,17}.
- In a systematic review by Feehan et al.⁷ including 15 clinical studies, 98.6% of 567 patients with medial knee OA experienced pain relief when fitted with an off-loading brace.
- As shown below, both OTS and Custom DONJOY offloader braces significantly reduced pain and stiffness, with OA Defiance significantly improving function when compared to no brace at all.



Graph shows pain, stiffness, and function components of the WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) in patients with varus knee OA wearing, **No Brace, DonJoy OA Defiance**, and **DonJoy OA Adjuster**. Lower values indicate improvement.

A DonJoy[®] off-loading brace can significantly improve pain, resulting in a more active life and increased quality of life.⁶

Increased Confidence and Activity

- The DonJoy OA Adjuster[™] improves knee confidence and perceived stability in patients with post-traumatic knee OA after ACL reconstruction⁹.
- A recent patient feedback study showed that a DonJoy OA Defiance[®] brace increases the possibility to perform daily
 activities and also enables increased mobility away from the home environment, including going to a local shop, resulting
 in a more active life and increased quality of life⁶.

A DonJoy® off-loading brace can bring back freedom of movement to knee OA patients⁶

THE OA TAKE-AWAY

DONJOY offloader bracing has been clinically proven to:

- Improve alignment
- Reduce knee moments
- Increase joint space
- Relieve pain
- Improve mobility and physical function

Offloader bracing may help patients who have documented:

- Pain during weight bearing or ascending / descending stairs
- Pronounced Varus or Valgus knee deformity
- Previous Menisectomy
- Excess/High BMI
- Recent injury or surgery
- Ambulatory with knee instability



Brian Cole, MD interview on OA brace patient selection.



CMS knee orthoses guideline

OA BRACING AS A SOLUTION

Knee braces for every stage of osteoarthritis

Our portfolio of knee OA braces covers every stage of OA severity. Whether a patient has early-onset or severe knee osteoarthritis, DonJoy® has the brace to help relieve their knee pain and get them moving again.





ROAM[™] OA

NEW



FULLFORCE[®]







OA NANO®





OA ADJUSTER™ 3



CUSTOM OA DEFIANCE®



MODERATE

REFERENCES

- 1. Arthritis Foundation. http://www.arthritis.org/
- Blagojevic M, Jinks C, Jeffery A, Jordan KP. Risk factors for onset of osteoarthritis of the knee in older adults: a systematic review and meta-analysis. Osteoarthritis Cartilage. 2010 Jan;18(1):24-33.
- Cameron KL, Hsiao MS, Owens BD, Burks R, Svoboda SJ. Incidence of physician-diagnosed osteoarthritis among active duty United States military service members. Arthritis Rheum. 2011 Oct;63(10):2974-82.
- 4. Cui A, Li H, Wang D, Zhong J, Chen Y, Lu H. Global, regional prevalence, incidence and risk factors of knee osteoarthritis in population-based studies. EClinicalMedicine. 2020 Nov 26;29-30:100587.
- Draganich L, Reider B, Rimington T, Piotrowski G, Mallik K, Nasson S. The effectiveness of self-adjustable custom and off-the-shelf bracing in the treatment of varus gonarthrosis. J Bone Joint Surg Am. 2006 Dec;88(12):2645-52.
- Dries T, VAN DER Windt JW, Akkerman W, Kluijtmans M, Janssen RPA. Effects of a semi-rigid knee brace on mobility and pain in people with knee osteoarthritis. J Rehabil Med Clin Commun. 2022 Jul 5;5:2483.
- 7. Feehan NL, Trexler GS, Barringer WJ. The Effectiveness of Off-Loading Knee Orthoses in the Reduction of Pain in Medial Compartment Knee Osteoarthritis: A Systematic Review. J Prosthet Orthot 2012;24(1):39-49.
- 8. Giori NJ. Load-shifting brace treatment for osteoarthritis of the knee: a minimum 21/2-year follow-up study. J Rehabil Res Dev. 2004 Mar;41(2):187-94.
- Hart HF, Collins NJ, Ackland DC, Cowan SM, Hunt MA, Crossley KM. Immediate Effects of a Brace on Gait Biomechanics for Predominant Lateral Knee Osteoarthritis and Valgus Malalignment After Anterior Cruciate Ligament Reconstruction. Am J Sports Med. 2016 Apr;44(4):865-73.
- Hart HF, Crossley KM, Collins NJ, Ackland DC. Bracing of the Reconstructed and Osteoarthritic Knee during High Dynamic Load Tasks. Med Sci Sports Exerc. 2017 Jun;49(6):1086-1096.
- 11. Khan M, Adili A, Winemaker M, Bhandari M. Management of osteoarthritis of the knee in younger patients. CMAJ. 2018 Jan 22;190(3):E72-E79.
- 12. Kwaees TA, Richards J, Rawlinson G, Charalambous CP, Chohan A. Can the use of proprioceptive knee braces have implications in the management of osteoarthritic knees: An exploratory study. Prosthet Orthot Int. 2019 Apr;43(2):140-147.
- Lee PY, Winfield TG, Harris SR, Storey E, Chandratreya A. Unloading knee brace is a cost-effective method to bridge and delay surgery in unicompartmental knee arthritis. BMJ Open Sport Exerc Med. 2017 Feb 21;2(1):e000195.
- 14. London NJ, Miller LE, Block JE. Clinical and economic consequences of the treatment gap in knee osteoarthritis management. Med Hypotheses. 2011 Jun;76(6):887-92.
- 15. Mistry DA, Chandratreya A, Lee PYF. An Update on Unloading Knee Braces in the Treatment of Unicompartmental Knee Osteoarthritis from the Last 10 Years: A Literature Review. Surg J (N Y). 2018 Jul 2;4(3):e110-e118
- Nadaud MC, Komistek RD, Mahfouz MR, Dennis DA, Anderle MR. In Vivo Three-Dimensional Determination of the Effectiveness of the Osteoarthritis Knee Brace: A Multiple Brace Analysis. J Bone Joint Surg Am. 2005;87 Suppl 2:114-9.
- 17. Nagai K, Yang S, Fu FH, Anderst W. Unloader knee brace increases medial compartment joint space during gait in knee osteoarthritis patients. Knee Surg Sports Traumatol Arthrosc. 2019 Jul;27(7):2354-2360.
- 18. Øiestad BE, Juhl CB, Culvenor AG, Berg B, Thorlund JB. Knee extensor muscle weakness is a risk factor for the development of knee osteoarthritis: an updated systematic review and meta-analysis including 46 819 men and women. Br J Sports Med. 2022 Mar;56(6):349-355.
- 19. Orishimo KF, Kremenic IJ, Lee SJ, McHugh MP, Nicholas SJ. Is valgus unloader bracing effective in normally aligned individuals: implications for post-surgical protocols following cartilage restoration procedures. Knee Surg Sports Traumatol Arthrosc. 2013 Dec;21(12):2661-6.
- 20. Richards J, Jones R, Kim W. Biomechanical changes in the conservative treatment of medial compartment osteoarthritis of the knee using valgus bracing. ICRS 2006
- 21. The Comprehensive Textbook of Clinical Biomechanics, 2nd Edition. Elsevier 2018. ISBN 9780702054891.
- 22. Segal NA, Glass NA. Is quadriceps muscle weakness a risk factor for incident or progressive knee osteoarthritis? Phys Sportsmed. 2011;39(4):44-50.
- 23. Sharma L, Song J, Felson DT, Cahue S, Shamiyeh E, Dunlop DD. The role of knee alignment in disease progression and functional decline in knee osteoarthritis. JAMA 2001;286:188–195.
- 24. Snoeker B, Turkiewicz A, Magnusson K, Frobell R, Yu D, Peat G, Englund M. Risk of knee osteoarthritis after different types of knee injuries in young adults: a populationbased cohort study. Br J Sports Med. 2020 Jun;54(12):725-730.
- 25. Tanamas S, Hanna FS, Cicuttini FM, Wluka AE, Berry P, Urquhart DM. Does knee malalignment increase the risk of development and progression of knee osteoarthritis? A systematic review. Arthritis Rheum. 2009 Apr 15;61(4):459-67.
- 26. Webster KE, Hewett TE. Anterior Cruciate Ligament Injury and Knee Osteoarthritis: An Umbrella Systematic Review and Meta-analysis. Clin J Sport Med. 2022 Mar 1;32(2):145-152.
- 27. WHO July 2023 Osteoarthritis Key Facts https://www.who.int/news-room/fact-sheets/detail/osteoarthritis
- 28. Yucesoy B, Charles LE, Baker B, Burchfiel CM. Occupational and genetic risk factors for osteoarthritis: a review. Work. 2015 Jan 1;50(2):261-73. doi: 10.3233/WOR-131739.
- 29. Mont MA, Cherian JJ, Bhave A, Starr R, Elmallah RK, Beaver WB Jr, Harwin SF. Unloader Bracing for Knee Osteoarthritis: A Pilot Study of Gait and Function. Surg Technol Int. 2015 Nov;27:287-93.



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