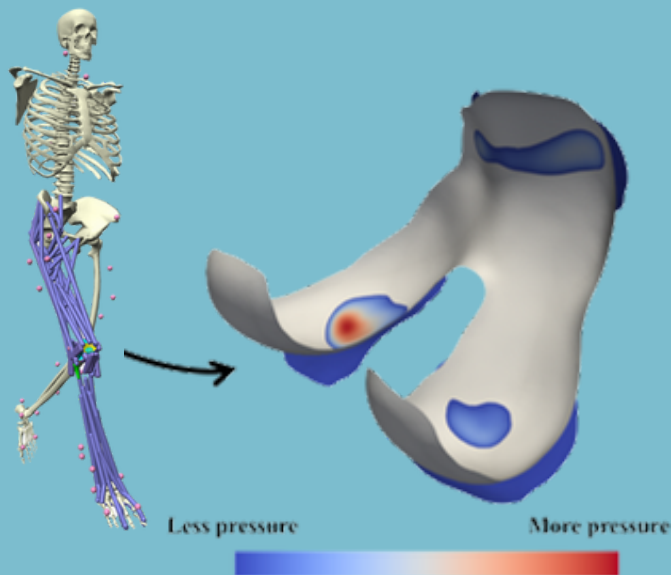




Does Valgus Bracing Reduce Pressure on Knee Cartilage in Varus Malaligned Medial Knee Osteoarthritis?

A cross sectional study

Rationale

Knee bracing is an attractive option for many osteoarthritis patients, but responses are highly variable and mechanisms of effect unclear.

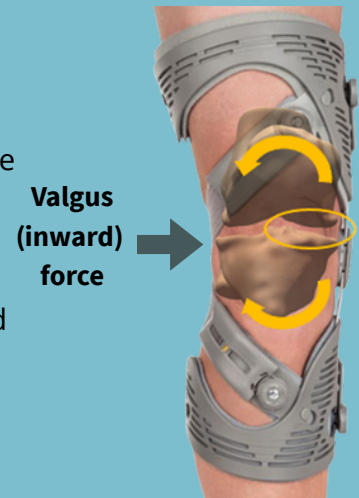
Tissue-level knee loading, such as the magnitude and location of cartilage pressure may provide important insights into potential mechanisms of bracing, but remain under investigated.

What we did

We used computer modelling to examine whether valgus bracing changes the magnitude and location of knee cartilage pressure

25 participants with bow-legged (varus malaligned) medial knee osteoarthritis walked with and without an Ossur Unloader One valgus knee brace.

3D motion analysis, electromyography, and knee MRIs were used to simulate knee cartilage pressure during braced and unbraced walking.



Findings

Compared to unbraced walking, braced walking:

- Reduced peak pressure upon the **medial tibial** and **medial femoral** cartilage by **12.5%**; with 21 of 25 participants (84%) reducing pressure **by at least 10%**.
- Moved the location of pressure upon the medial tibia and femur cartilage **more lateral** (by 5% of cartilage width) and **more posterior** (by 2% of cartilage length).
- Did not change the magnitude or location of pressure upon the patella cartilage.

Conclusion

Valgus bracing reduced the magnitude and altered the location of medial knee cartilage pressure in patients with varus malaligned medial knee osteoarthritis.

These mechanisms may be clinically relevant by shifting load off and/or away from structural sources of weightbearing pain (e.g., bone marrow lesions, cartilage defects), but such hypotheses require further investigation.

Implications

This study uncovered novel mechanisms of brace action that can guide improved brace design and inform future clinical trials to evaluate whether brace-induced changes to cartilage pressure creates meaningful benefit to certain patients.

This will ultimately support clinicians in identifying which patients are most likely to benefit from valgus bracing.