



Clinical information

- 54-year-old man
- Has chronic pain in his right knee
- Pain located mainly around the medial joint line
- Pain increases during activities (hockey, walking, etc.)
- Previously consulted his family doctor:
 - Suspects cartilage degenerative changes
 - Prescribed acetaminophen to help reduce pain
 - Instructed patient to come back for NSAID if pain increases



Recommendations following the KneeKG™ exam (see results on reverse side)

1. Physical therapy treatments to address the identified biomechanical deficiencies:

Limited flexion excursion during loading phase

- Avoids painful position since more weight is applied on the knee

Limited extension excursion during stance phase

- Avoids the complete extension to stabilize the joint

Limited range of motion in the sagittal plane

- Commonly seen in kneeOA patients due to joint stiffness

Varus thrust: Increased adduction during loading phase

- Varus movement compressing the medial compartment. This biomechanical marker is directly associated with the progression of knee OA³

Specific recommendations for physical therapists :

- Exercises to increase knee stability near full extension
- Increase knee stability in the frontal plane (to limit the varus thrust)
- Quadriceps and hamstring strengthening and stretching
- Exercises to increase proprioception
- Scientific literature shows that walking with an increased toe out angle or with an ipsilateral trunk lean helps to reduce the load on the medial compartment and reduce the varus thrust. Treatments should therefore look at the musculature allowing these compensatory mechanisms.

2. Referral for orthotics to address the identified biomechanical deficiency:

Knee varum throughout the gait cycle

- Compresses continuously the knee medial compartment
 - Option 1: foot orthotics (in shoes and hockey skates) to help decrease varum
 - Option 2: if no benefits from foot orthotics, should consider valgus knee brace

3. Referral for a knee X-ray:

- weight bearing X-ray required

4. Patient should stay active:

- Increase cardiovascular activities (limiting the impacts)

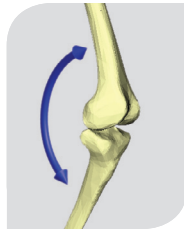
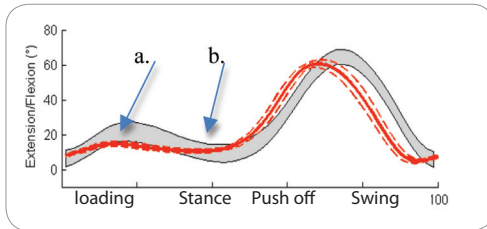


Case Study – Knee osteoarthritis – Integrating the KneeKG™

KneeKG™ results coincide with knee osteoarthritis biomechanical patterns

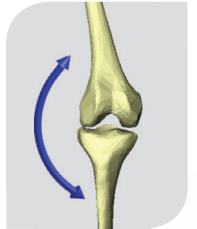
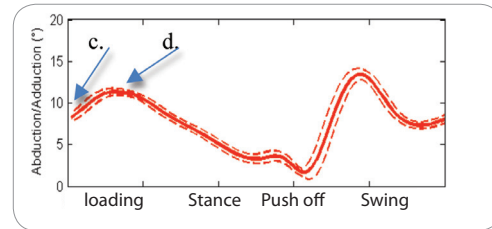
- 1) Decreased flexion excursion during loading (see a.)¹
- 2) Decreased extension excursion during terminal stance phase (see b.)²
- 3) Decreased flexion/extension range of motion (56°)¹
- 4) Knee in varus position at initial contact (8°) (see c.)² and maintains a varus position throughout the full gait cycle
- 5) Varus thrust³: increased adduction during the loading phase from 8° to 11° (see d.)

Knee flexion/extension



(grey curve represent the normal)

Knee adduction/abduction or varus/valgus



Benefits of using the KneeKG™

- Identification and quantification of biomechanical deficiencies associated with the progression of knee osteoarthritis⁴
- Optimization of the treatment plan and a more specific patient management which takes into account mechanical factors⁵
- Investigation and documentation of the mechanical etiology of the pathology
- Precise information concerning the impact of the pathology on the joint function during a dynamic and weight bearing activity
- Recognition of mechanical factors needed to be address and followed over time in order to slow down degenerative changes
- Patient education tool allowing to understand the development and progression of the pathology

¹Astephen et al. 2008 J Ortho Res 26(3) p.332; ²Schmitt 2007 Arthritis Rheum 57(6) p.1018; ³Chang et al.2004 Arthritis Rheum 50 (12) p.3897;

⁴Andriacchi et al.2006 Curr Op Rheumatol 18(5) p.514; ⁵Hunter 2009 Ther Adv Musculo Dis 1(1) p.259