The Simple Next Steps
2 “new” considerations on knee loading and gait modification

Joaquin Barrios, PT, DPT, PhD

The goal:
↓ peak knee adduction moment

Walk slower (↓ 8%)
Widen step width (↓ 9%)
Toe in (↓ 20%)
Toe out (affects 2nd peak)
Trunk lean (↓ 20-65%)
Medial knee thrust (↓ 32-50%)
Hip IR/adduction (↓ 19%)
Flex knee less (not clear)
Real-time KAM (↓ 50%)
Others...

THE GOOD: CORRELATED TO PRESENCE, SEVERITY, PROGRESSION OF MEDIAL KNEE OA

THE BAD: CORRELATION≠CAUSATION, SENSITIVE TO HOW CALCULATED, MAY CHANGE WITHOUT JOINT FORCE CHANGE
Better options?

These options can
- be calculated from the same data as pKAM
- provide cumulative load estimates
- provide compartment-specific load estimates

Gait speed example using compartment-specific impulse data (n=30) (under review, Clinical Biomechanics)

What is more clinically important? Peak tissue stress or accumulated load over time/distance?

NASA-TLX

How much easier does this get?
2 key takeaways

• RIP pKAM?
  • pKAM may be less favorable of a target than both KAM impulse and compartment-specific joint contact forces
  • Can you believe it — WALK FASTER?? Stay tuned....

• Gait modifications can be learned, but remain difficult
  • Baseline difficulty matters, so choose wisely and consider your goals
  • Multi-session training only reduces difficulty/effort by ~50%
  • Recommend future studies use NASA-TLX to assess locomotor task learning

THANK YOU!