



SINGLE-LEGGED HOP SCORES EARLY AFTER ACL INJURY ASSOCIATED WITH KNEE OA 5 YEARS LATER

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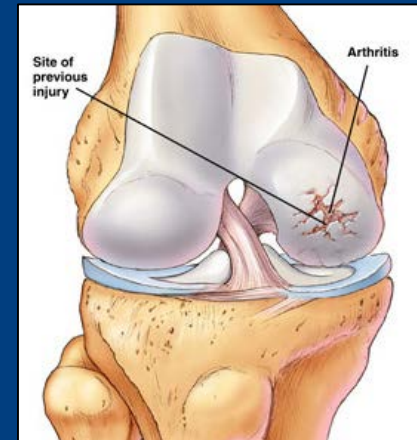
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- Post-Traumatic Knee Osteoarthritis (OA)
 - ~12% of the overall burden of OA in the U.S. (Brown 2006)
 - \$3 billion annual financial burden
- OA after anterior cruciate ligament (ACL) injury
 - 50% will develop OA 10-20 years after injury (Lohmander 2007)
 - Risk of lifelong pain, impaired knee function, reduced physical activity, and poor quality of life (Lohmander 2007)
- Little is known regarding risk factors of OA after ACL injury



To determine whether clinical differences exist early after ACL injury between those who do and do not develop radiographic knee osteoarthritis 5 years later

- Acute, unilateral ACL injury
 - Cutting & pivoting athletes
 - 16 women, 30 men
 - Mean age 30.3 ± 11.7 yrs.
- Exclusion criteria:
 - Repairable meniscus
 - Symptomatic grade III injury to other knee ligament
 - Articular cartilage lesion $> 1 \text{ cm}^2$

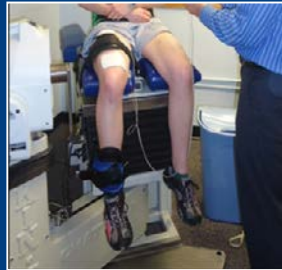


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TESTING: 79.7 ± 148.9 DAYS AFTER ACL INJURY

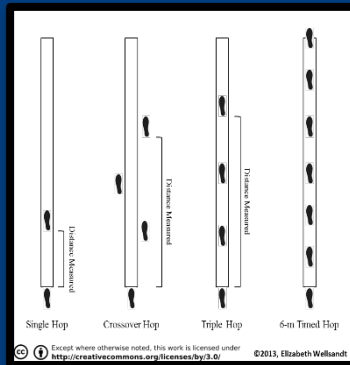
Quadriceps Strength

Burst
Superimposition
Technique
(Snyder-Mackler 1994)



Single-Legged Hop Tests

- Single, Crossover, Triple Hop for Distance
- 6-meter Timed Hop (Noyes 1991)

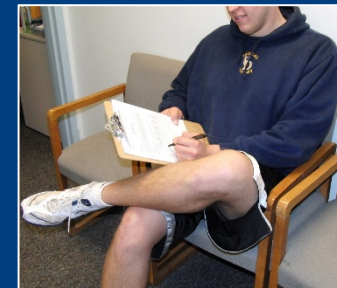


Limb Symmetry Indexes

100% = Symmetry
<100% = Impaired Involved Limb

Patient-Reported Outcomes

- Knee Outcome Survey Activities of Daily Living Scale (KOS)
- Global Rating of Perceived Function (GR)
- International Knee Documentation Subjective Knee Form (IKDC)



All Patient-Reported Outcomes

100% = Best Score

5 Years

- Posterior-Anterior Bent Knee (30°) Radiographs
 - 5 years after ACL reconstruction or non-operative rehabilitation
 - Kellgren-Lawrence (KL) scale – involved tibiofemoral joint (Kellgren 1957)

- nonOA = KL grade of 0-1 (N=36)
- OA = KL grade of 2-4 (N=10)

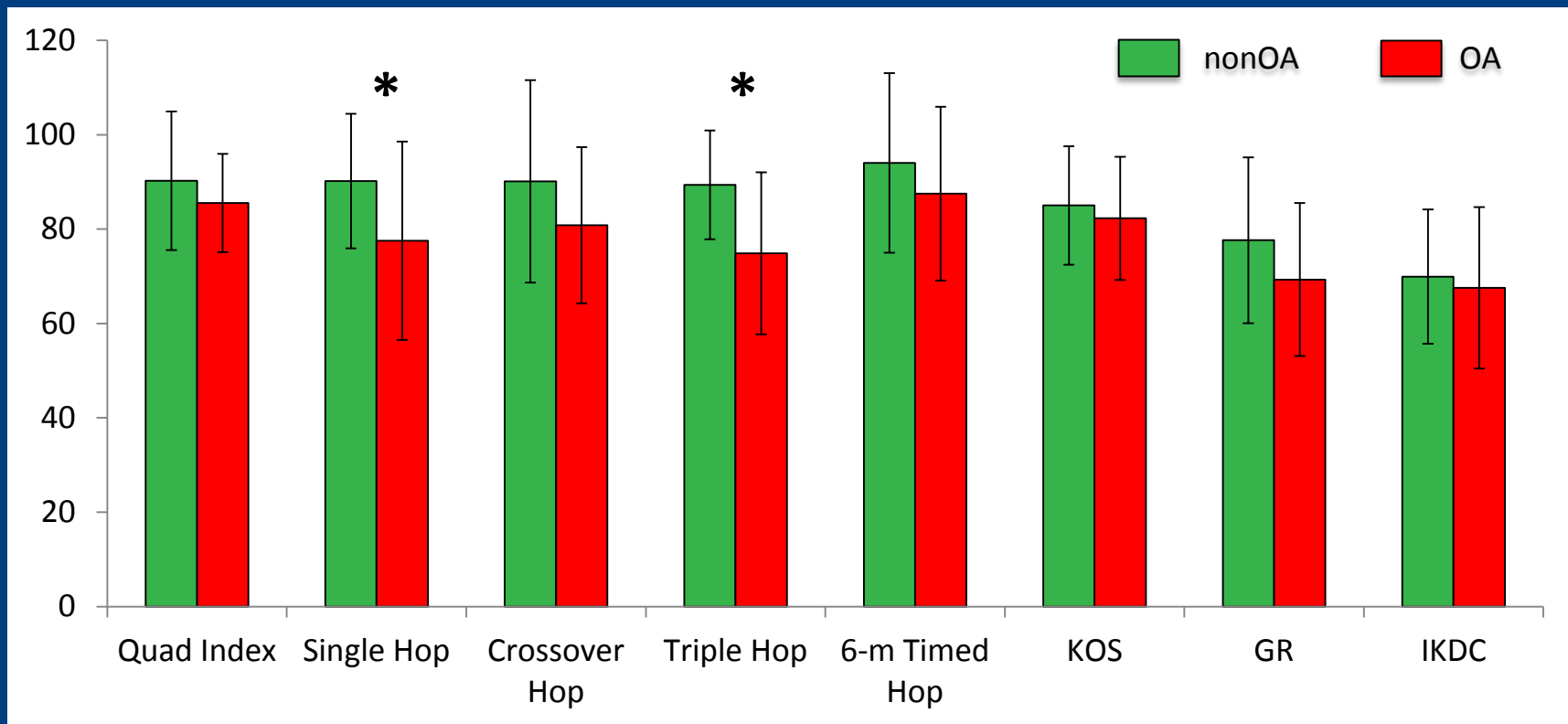


- Statistics
 - Independent t-tests and Fisher's exact tests to compare the nonOA and OA groups

- No differences between nonOA (N=36) and OA (N=10) group in demographics or baseline characteristics
 - Age ($p=0.569$)
 - Sex ($p=0.455$)
 - BMI ($p=0.926$)
 - Time from ACL injury to testing ($p=0.590$)
 - ACL reconstruction or non-operative rehabilitation ($p=0.319$)
 - ACL Reconstruction: N=39 Non-operative Rehabilitation: N=7



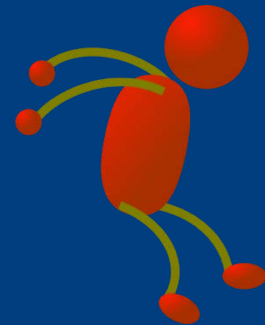
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Asterisk represents $p \leq 0.05$

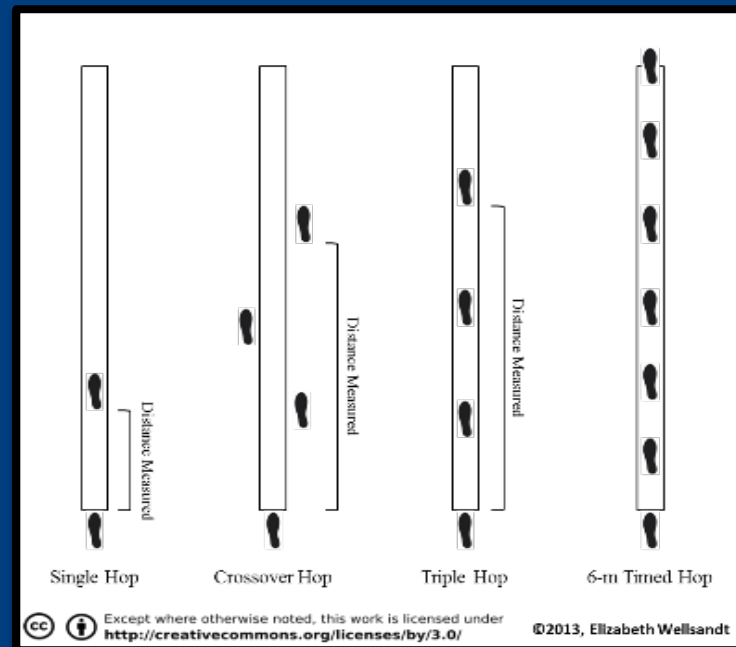
- No group differences in quad strength, crossover hop, 6-meter timed hop, KOS, GR, or IKDC
- *OA group scored worse on single and triple hop than the nonOA group*

- Athletes who develop knee OA within 5 years of ACL injury hop worse (greater interlimb asymmetry) than those who do not develop OA
 - Hop tests: Simple clinical test which may be sensitive to the risk of post-traumatic knee OA
 - Altered joint biomechanics are thought to be a key mechanism in the development of OA after ACL injury
 - Future Work: Investigate whether worse single-legged hop scores are predictive of asymmetric gait biomechanics



(Lohmander 2007)

Athletes who develop early onset knee OA by 5 years after ACL injury demonstrate significantly lower single-legged hop scores early after injury compared to those without radiographic knee OA.



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