



SPORTS SURGERY CLINIC
*Specialists in Joint Replacement, Spinal Surgery
Orthopaedics and Sport Injuries*

The Relationship Between Hop Distance and Control in ACLR Players

Brendan Marshall PhD



Introduction



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Pro football squad - 1 ACL injury every second season

(Ekstrand J., 2014)

To assess return to play status:

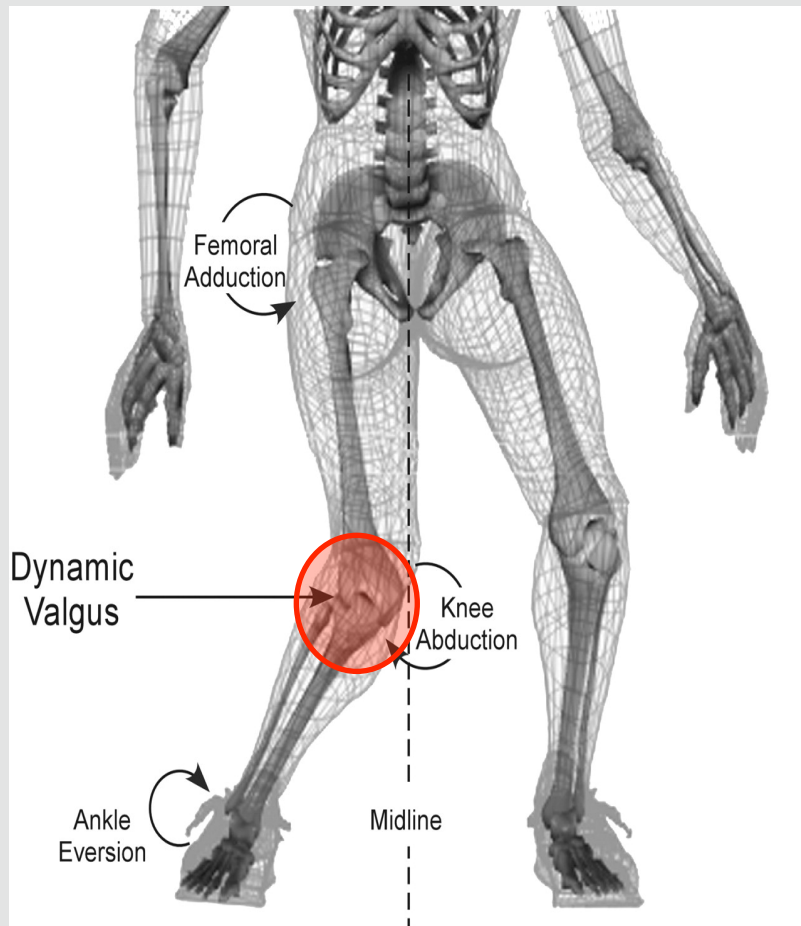
- Isokinetic peak force (strength)
- Jump/hop distance (power)



Quality of movement control is often overlooked

(Paterno et al 2010)

Introduction



Excessive knee valgus is a risk factor in ACL injury (Hewett et al. 2005)

Landing technique (Laughlin et al. 2011)

‘Soft’ landing -  ACL force by 11%

Lateral trunk flexion increases knee valgus moment (Kimura et al. 2014)

Is movement control distinct from movement performance?

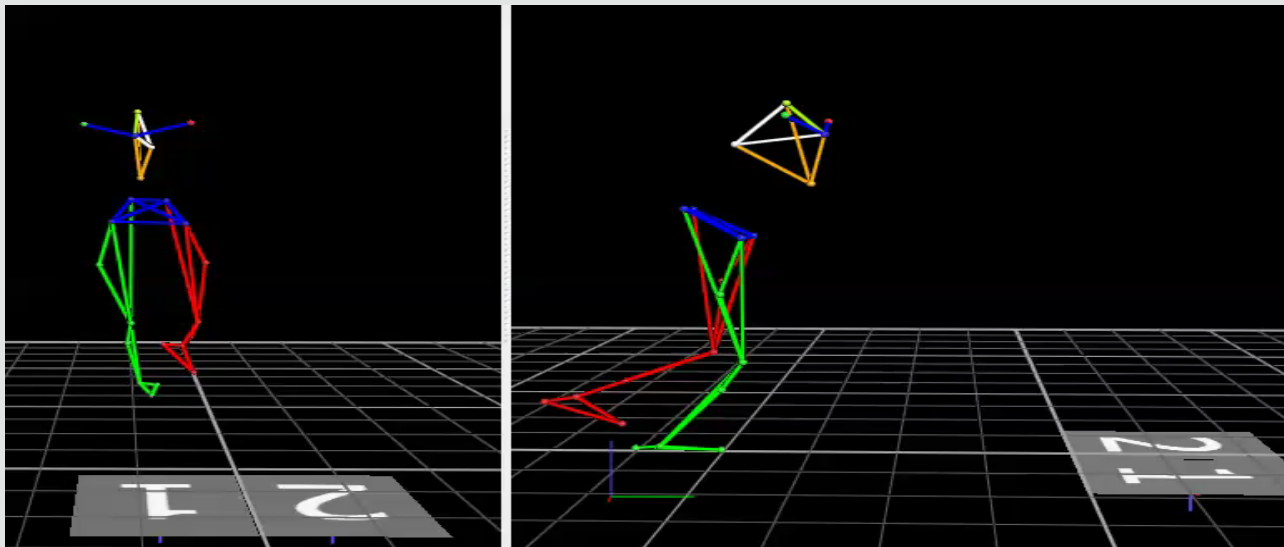
Study Aim and Methods



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To examine the relationship between single leg hop for distance and landing control in ACLR patients

30 field sport athletes 6 months post patellar tendon ACLR
 25.4 ± 2.3 yrs; 182.3 ± 4.6 cm; 80.7 ± 6.0 kg



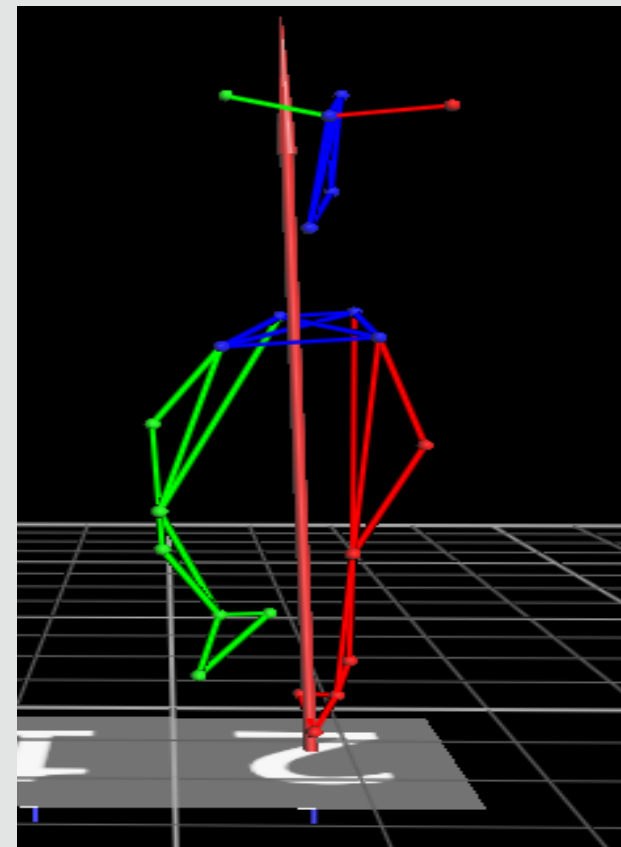
Methods

Qualitative assessment

Start with 5 points, 1 deducted for:

- Loss of control at the knee
- “ at the pelvis
- “ at the torso
- Loss of balance on landing
- Poor load absorption

(Hewett et al 2002, Shelbourne et al 2012)



Classification: 0-2 = poor control; 3-5 = good control

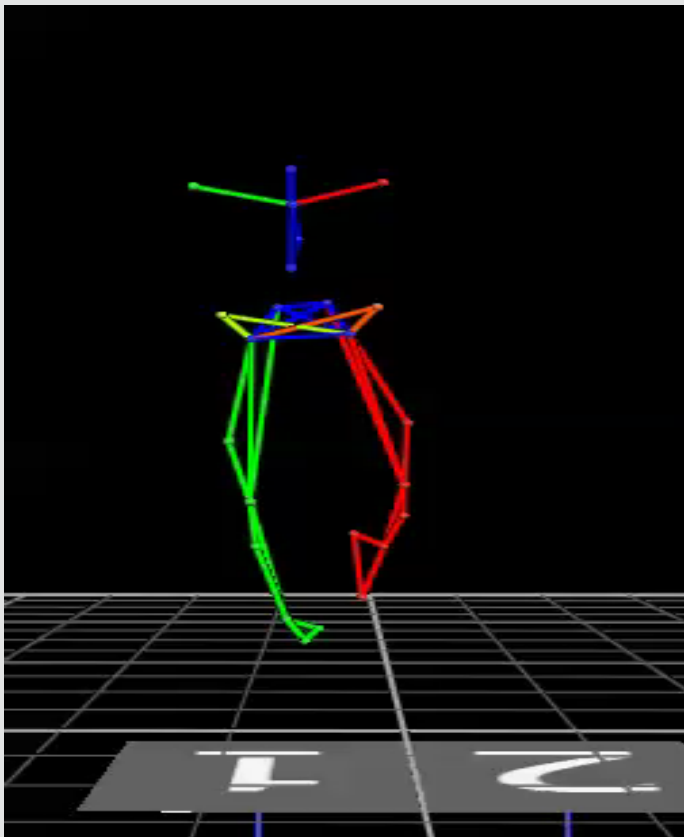
Independent t-test, $P < 0.05$

Results

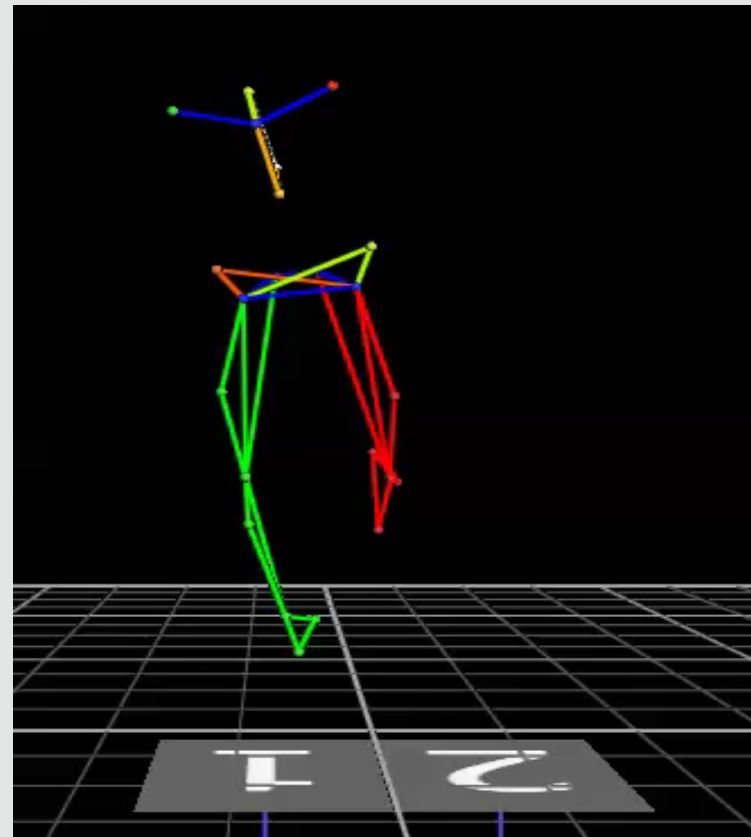


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- Good control: n = 16



- Poor control: n = 14



Results



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No significant ($P > 0.05$) difference in jump distance

Good control (n = 14)	Poor control (n = 16)	Difference
171.3 ± 25.0cm	168.8 ± 23.8cm	2.5cm (P = 0.79)

Discussion



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Power generation and movement control are distinct qualities

Implication:

Important to assess dynamic movement control as a distinct return to play criteria

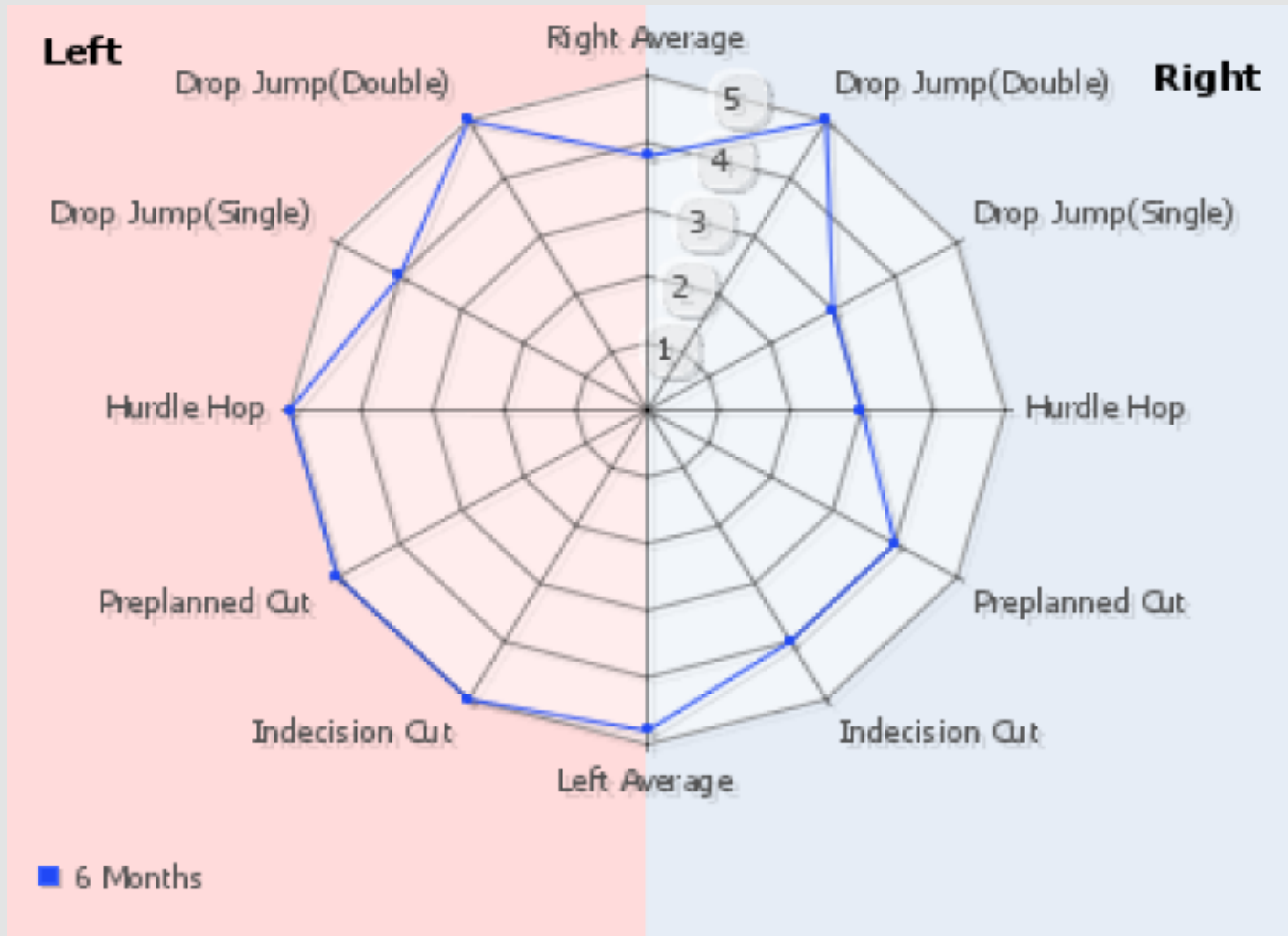
An overreliance on performance outcome may result in a return to play with deficient control and an increased injury risk

(Myer et al 2005, Hewett et al. 2013)

Excerpt from ACLR Report



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Discussion



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47% of the ACLR patients tested exhibited poor landing control 6 months post surgery

[6.5 months before return to team training in pro football (Ekstrand J., 2014)]

Move toward function based rather than time based return to play criteria

Potential Limitations



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2 classifications of control - 'good' or 'poor'

Qualitative assessment of landing

Used 3D clips to assess control

Acknowledgements



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@benny_marshall @SSCSantry