Dynamic Bracing for ACLD and ACLR Knees

The problem:

- The quadriceps muscle causes the tibia to translate anteriorly in the last 30 degrees.[1]
- The Hamstrings reflex is twice as slow in ACLD knees. [2]
- The four difficult maneuvers for ACLD knees (stopping, running downhill, landing from a jump, and lateral maneuvers) all involve an open kinetic chain phase in which the knee is more extended and the tibia is subluxed at foot strike. [3]
- The Hamstrings cannot control the tibia in the last 15 degrees of extension. [4]

The solution:

- Dynamic braces use quadriceps power to place an increasingly higher force posteriorly against the tibia as the knee extends into the last 30°.[5]
- This force stops the tibia from translating anteriorly prior to foot strike.[6]
- The hamstrings respond sooner to tibial movement in a brace. [7]
- Symptomatic ACLD Patients using dynamic braces are able to do maximal effort isokinetic extension with no quadriceps inhibition or anterior translation and the symptoms are therefore reduced or eliminated. [6]
- The same subluxing forces seen in ACLD knees place high forces on ACLR ligament grafts with no protective reflexes eventually resulting in a high percentage of stretched grafts which could have otherwise been further protected by dynamic bracing.[5,6]

---

[1] Renstrom etal, *Am J Sport Med* 1986;14:83–7.

[2] Beard etal. *J Orthop Res* 1994;12:219–28.

[3] Andriacchi etal. *J Biomech*. 2005; 38 (2): 293-8

[4] Hirokawa etal. *Am J Sport Med* 1992;20:299–306.

[5] **S**olomonow M, *J ElectroMyography Kinesiology*;16 (2006): 549-567

[6] Acierno etal, *Orthopedics* 1995;18:1101–7

[7] Lam etal, *Arch Phys Med Rehabil.* 2002 Jul;83(7):1009-12.

Bledsoe Brace Systems
2601 Pinewood Drive
Grand Prairie, TX 75051
Office: 972-647-0884
www.bledsoebrace.com