



Spinal Fitness

Physics Demonstration of the Leg Extension Exercise

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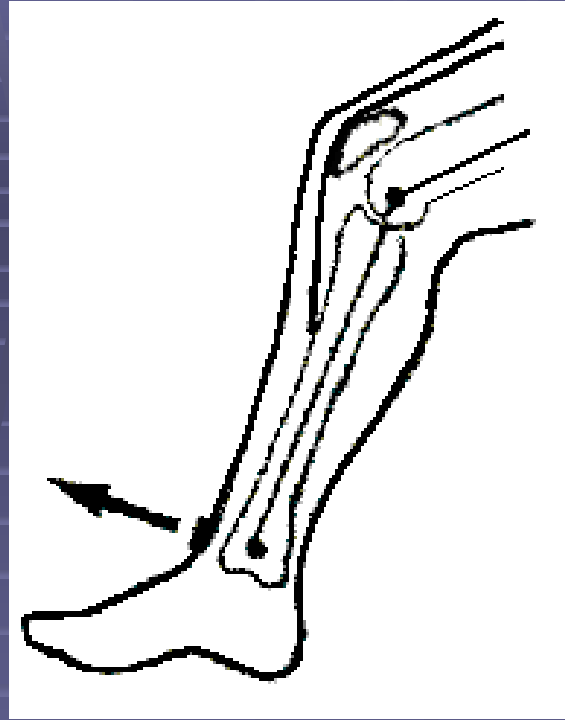
Athletic Spinal Fitness Institute

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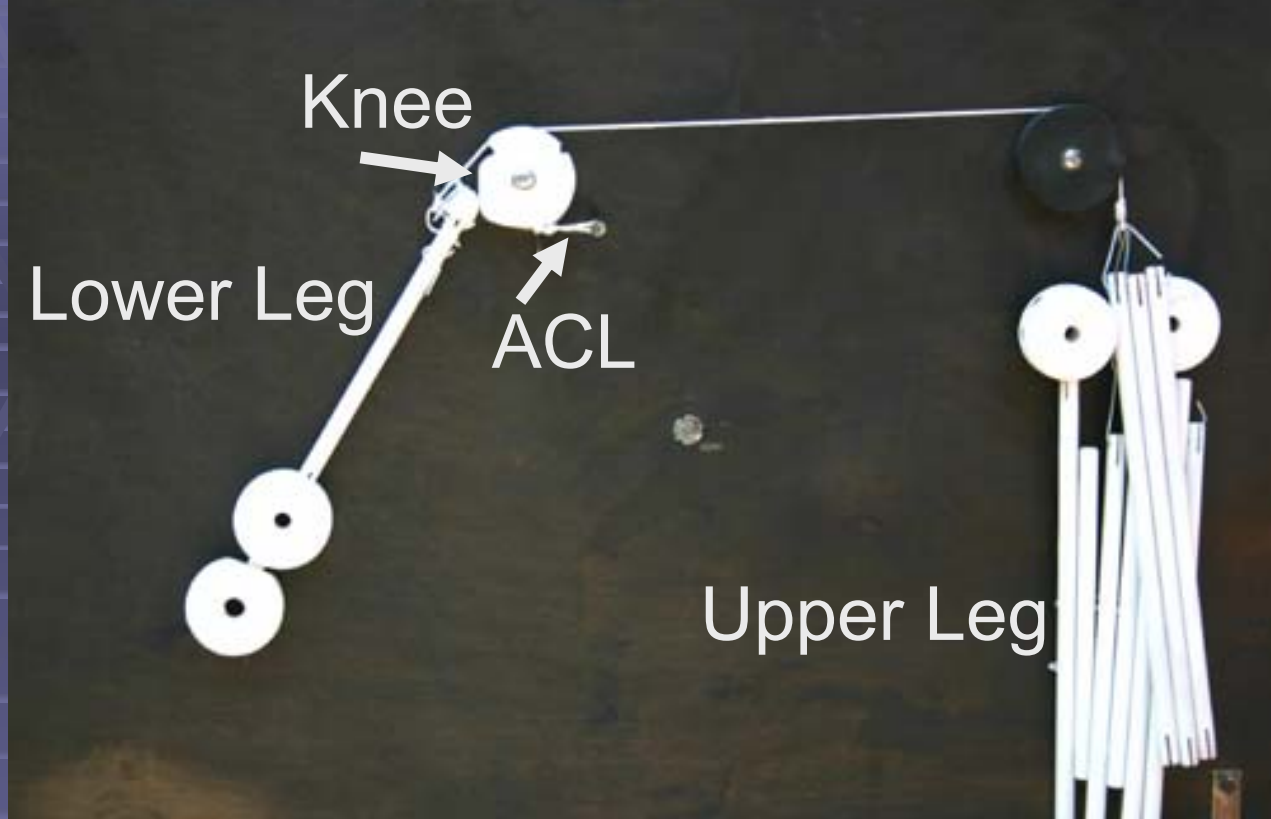
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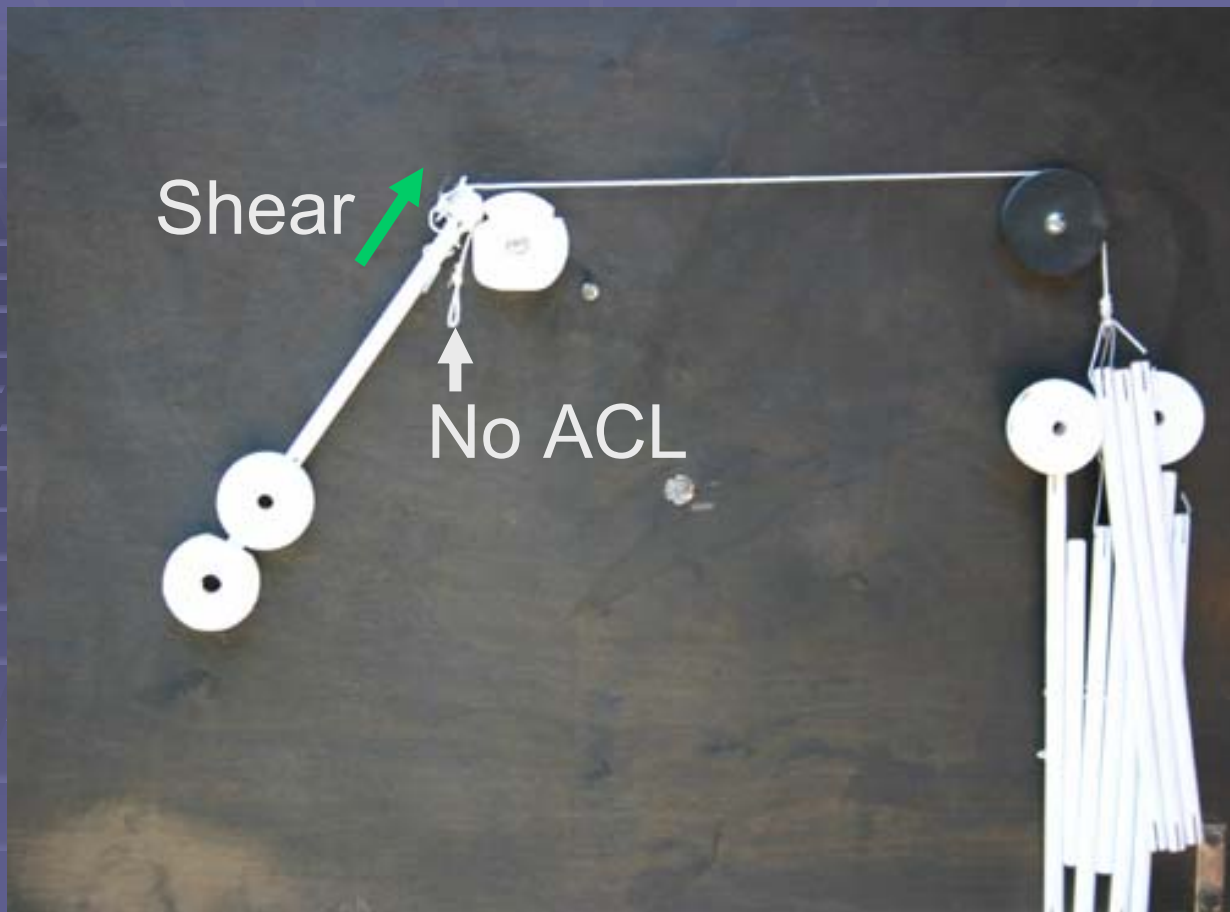
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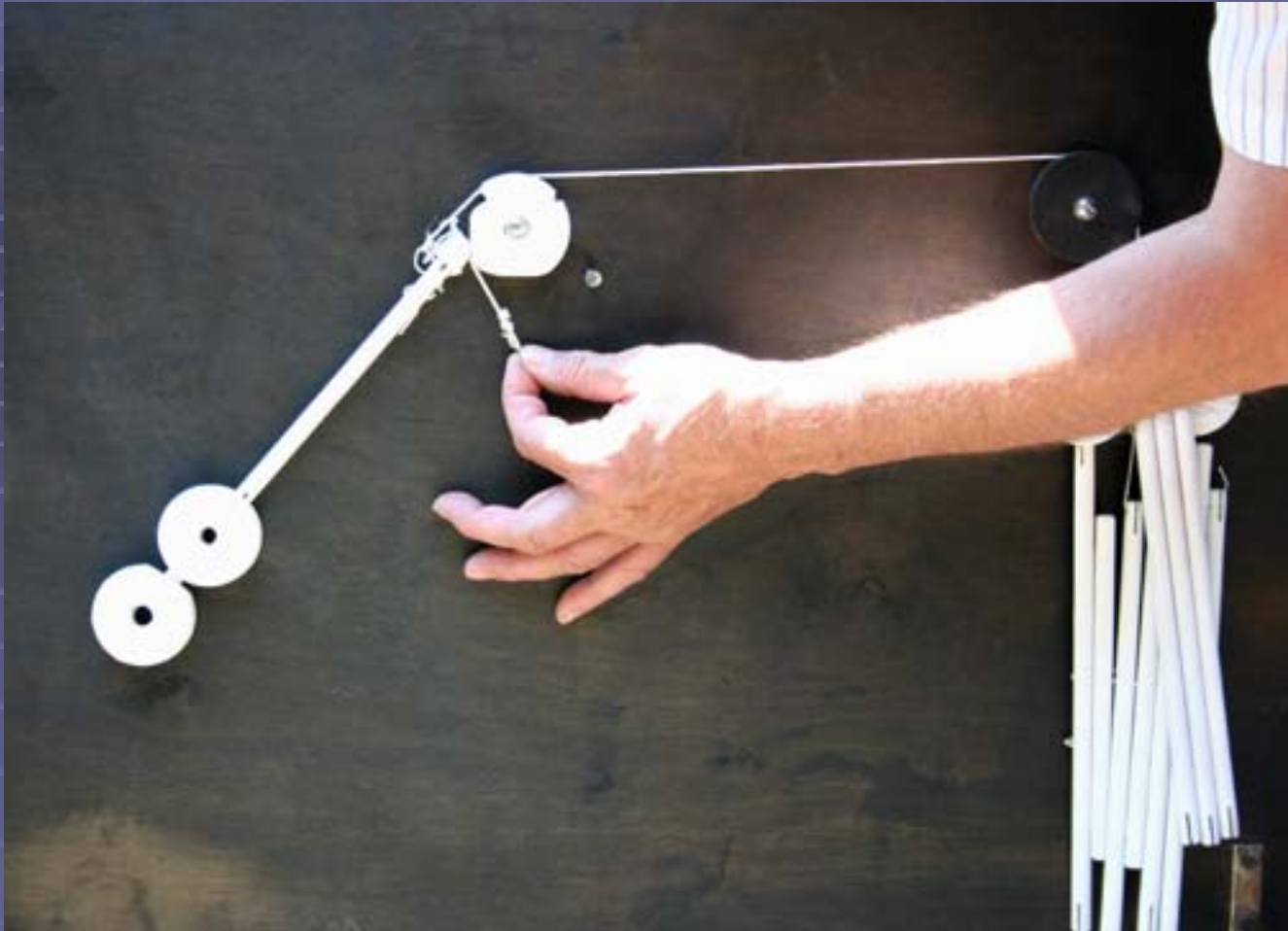
In the leg extension exercise, there is both compression and shear force created at the fulcrum. Compression is into the articular joint surfaces, shear is stopped by the anterior cruciate ligament (ACL).



In this demonstration, the weights on the right represent the amount of muscle effort (weight) to lift the lower leg as shown. Notice how the stick illustrating the lower leg is held in place by an additional string simulating the ACL which stops the upward shear force of the lower leg at the knee.

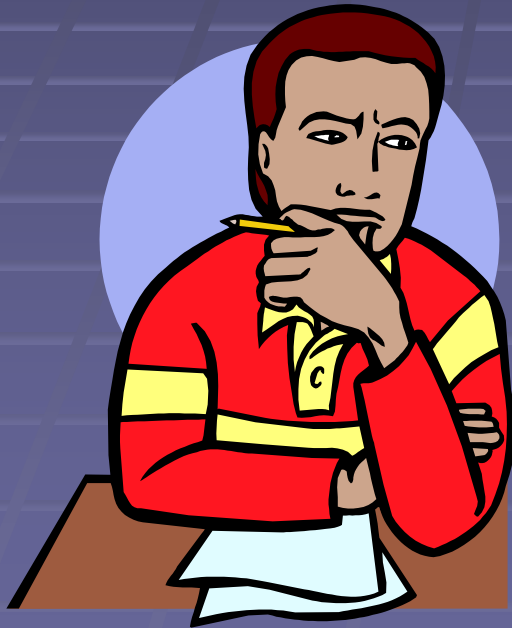


We have unhooked the string that represented the ACL to demonstrate how the lower leg at the knee has now sheared upward. The string, having been removed, can no longer act as a shear stabilization mechanism and is unable to stop dislocation at the knee.



Here we are holding the string acting like the ACL. This action is able to stop the shearing upward at the knee caused by the leg extension exercise.

People are to perform an exercise like the leg extension because “a strong leg muscle makes a strong joint” or “a strong muscle takes force off the joint.”



Anyone can see that these statements are not true. The joint is only as healthy as the condition of it's parts (articular surfaces, ligament) to maintain the forces created by muscle activity.