

### Classical triade of a comprehensive sports training



However: the vast majority of sports related overuse injuries occur in fascial connective tissues. Apparently the collagenous tissues are then less adequately prepared compared with the muscular fibers or the cardiovascular fitness.

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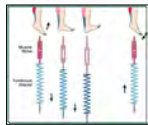
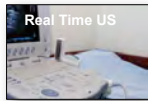
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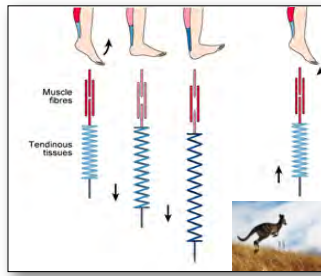
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### New ultrasound findings

Kawakami 2002



Usual muscle contraction:  
Muscle fibers shorten  
Tendon keeps same length



Movements with elastic recoil  
Muscle fibers contract almost isometrically.  
Fascial elements lengthen & shorten like an elastic spring

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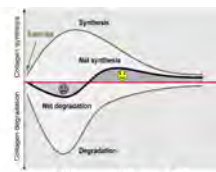
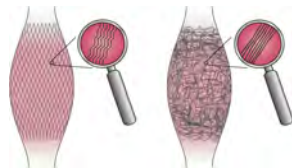
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### Healthy loading induces remodeling of fascial architecture




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Eur J Appl Physiol (2018) 118:539–548  
DOI 10.1007/s00421-018-1667-8

ORIGINAL ARTICLE

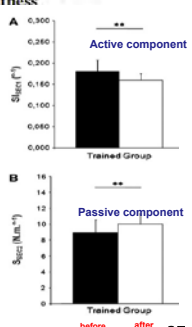
### Effects of plyometric training on both active and passive parts of the plantarflexors series elastic component stiffness of muscle–tendon complex

Alexandre Fouré · Antoine Nordez · Peter McNair · Christophe Cornu

34 sessions of plyometric training (1 hr each) over 14 weeks

A significant increase in the passive component of the SEC stiffness was found. In contrast, a significant decrease in the active part of the SEC stiffness was observed

No significant changes in plantarflexor muscles CSA, architecture and Achilles tendon CSA were seen



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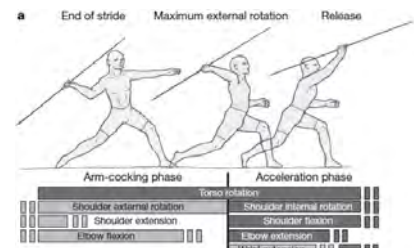
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LETTER

doi:10.1038/s41598-018-22267-8

### Elastic energy storage in the shoulder and the evolution of high-speed throwing in *Homo*

Neil T. Roach<sup>1,2</sup>, Madhusudan Venkadesan<sup>3</sup>, Michael J. Rainbow<sup>4</sup> & Daniel E. Lieberman<sup>1</sup>



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### How to include specific fascia training in a standard muscle gym environment

- Working with 1/3rd of usual weight
- Mindful attention (3 seconds)
- Tensegral expansion
- Preparatory counter movement
- Proximal initiation of main movement
- Mini-bounces in both end-positions
- Embodiment (3 seconds)

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- For hypomobile persons:**
- No mini-bounces in long-stretched position only.
  - final exhausting mini-repetitions in long-stretched position.
- For hypermobile persons:**
- Short percussive bounces in short-fibred position
  - Proprioceptive refinement in long-stretched position
  - Final exhausting mini-repetitions in short-fibred position

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**Clinical application:**

1. Inclusion of elastic recoil (2x/week)
2. Appropriately tailored loading in long stretched vs. shortened positions
3. Inclusion of slow melting stretches as well as active resistance stretches
4. Allow for slow remodeling process (0.5 to 2 yrs)

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**THANK YOU**



[www.fasciaresearch.de](http://www.fasciaresearch.de)

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