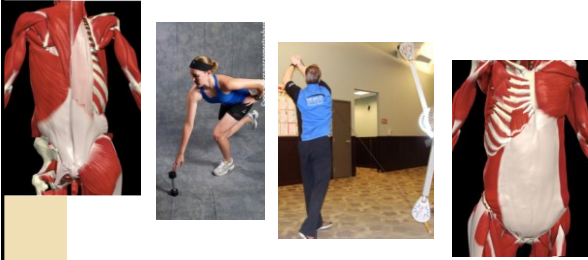


### STRENGTH TRAINING LOW BACK INJURIES WITH MYOFASCIAL SLING SYSTEMS



Dean Somerset  
BSc. Kinesiology, CSCS, CEP, MES

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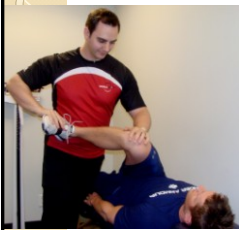
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### A little about myself...



- BSc. Kinesiology
- CSCS – NSCA
- CEP – CSEP
- MES – AAHFRP
- PRO Trainer; Can Fit Pro
- Medical & Rehabilitation Coordinator, World Health.
- Former competitive athlete with multiple injuries
- Clientele ranges from pre-post surgical, MVA, cancer patients, up to athletes and “weekend warriors”

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### Today's Webinar:

- Hopefully make you question everything you ever learned in anatomy class
- Will make you feverishly scratch a hole in the side of your head
- Make you feel like Neo trying to figure out the Matrix
- Show how all “common sense” workout programs are completely incorrect
- Open some new ways of thinking to help you get better results for your clients

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### Low Back Injuries



- Most commonly the result of high volume low amplitude (HVLA) force application – REPETITIVE STRAIN!! Very few are from acute accidents!!
- Why is this area so susceptible?
- What makes the back so strong in some and weak in others??
- What can trainers do about it???

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### What We We Know....

- Muscles have defined and specific origins and insertions
- The muscle fibre is the only part of the motor unit that can undergo contraction
- The sensory fibres for muscles are the golgi tendon organ and the muscle spindle

**WRONG!**

**NOPE!**

**THERE'S MORE!**

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**WTF?!?!**



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### What Actually Happens...

- Muscles interconnect through fascial networks to form more powerful connections than individual muscles
- Fascia has tensile strength of 2000 PSI compared to 4700 PSI in the ACL – strong, and lots of it!!
- Sum of parts < unit as a whole

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### What Actually Happens...

- Fascia has contractile properties
- may even carry an electrical charge
- can sense pressure and tension changes
- Provides net to support blood vessels, nerves, etc in tissues
- provides compressive forces to contracting muscles

-Schlep, 2003. Fascial Plasticity: A New Neurological Explanation

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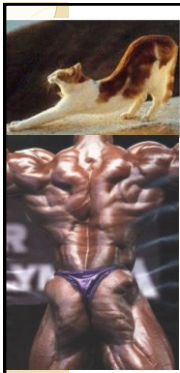
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### What Actually Happens...

- Fascia can sense tension and relay info back through spinal reflex loops (Pacini and Rufini mechanoreceptors)
- Most sensory nerves come from myofascial tissue, primarily as mechanoreceptors that can also act as pain receptors (nociceptors)
- **Fascial mechanical dysfunction creates pain!!!!**

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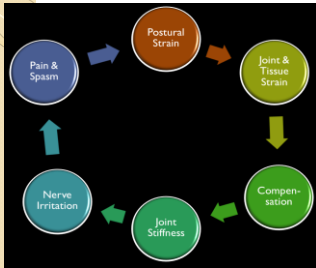
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### What Actually Happens...




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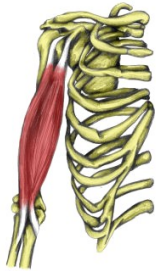
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### Current View of Anatomy



- Reductionist view, looks at muscles as isolated units
- Belief that muscles cause movement of bones closer to each other
- Does NOT look at connection of muscle to other tissues
- Fascia is no where to be seen

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### Current View of Anatomy



- Muscles CANNOT be isolated, so look at how they work TOGETHER
- Muscles pull on fascia to cause movement AS MUCH as they pull on bones – muscles pull on muscles
- Training individual muscles is *ineffective* in solving bad backs (there's hundreds of them!!)
- Train the back with movements involving the scapula and pelvis!!!!

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### Current View of Anatomy



- Abdominals have few bony attachments (ribs & pelvis), and have multiple fascial attachments to create movement
- Fascial integrity and **plasticity** therefore plays a huge role in back injury prevention and rehabilitation

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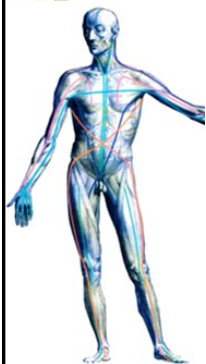
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### Myofascial Meridians



- Based on Thomas Myers' work in "Anatomy Trains"
- Integrated view of anatomy, links muscles into lines of force, allows for greater movement capabilities than individual muscles
- Explains complex systems of movement mechanics, repetitive strain injuries, & force coupling relationships better than individual muscles

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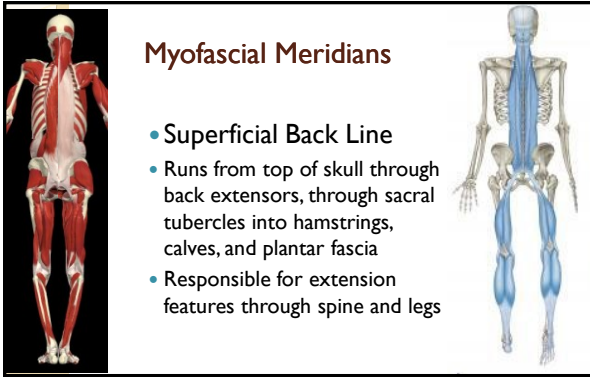
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**Myofascial Meridians**

- Superficial Back Line
- Runs from top of skull through back extensors, through sacral tubercles into hamstrings, calves, and plantar fascia
- Responsible for extension features through spine and legs



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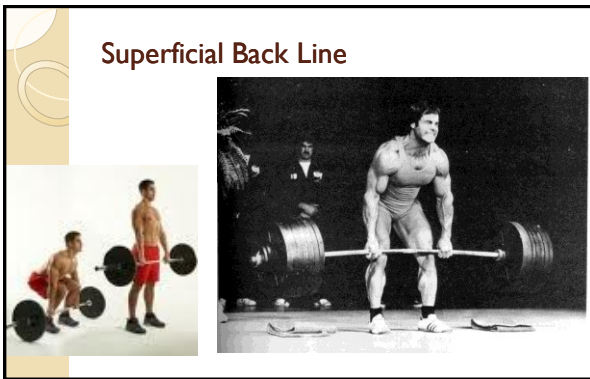
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**Superficial Back Line**



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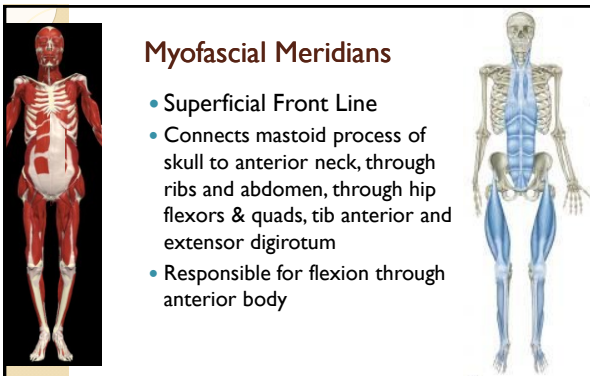
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**Myofascial Meridians**

- Superficial Front Line
- Connects mastoid process of skull to anterior neck, through ribs and abdomen, through hip flexors & quads, tib anterior and extensor digirotum
- Responsible for flexion through anterior body



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### Superficial Front Line



Or..



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### Myofascial Meridians



- Spiral line
- Splenius Capitus through trapezius, rhomboids, serratus anterior; external obliques into contralateral internal obliques, tensor fascia lata, IT band, hamstrings, calves, tib posterior & peroneal "stirrup"
- Responsible for rotational or twisting movements and integration of left and right sides



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### Spiral Line



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### Fascial Response to Stress

- Wang et al (2007): leg lengthening at a rate of 1mm/d and 2mm/d in rabbits with external fixation, viewing deep fascia changes after increasing tibial length to additional 10%
- Normal wavy collagen fibres became necrotic when stretched at 2mm/d, and underwent active recovery at a rate of 1mm/d
- Chronic strain (above threshold of 1mm/d) causes a breakdown of **fascial** tissue, leading to mechanical dysfunction and pain not observable on MRIs or X-Rays

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### Fascial Response to Stress



*“The efficacy of treatment depends on impulses traveling along the lines of fascia, so if the fascia is **dehydrated, cut** (as in accident or operations) or **fixatrophic**, the impulses will not travel so well.*

*Some very interesting research has also shown that muscles will **relax immediately** when a client drinks water”*

John Wilks, Bowen Institute

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### Fascial Response to Stress

- Fascial adhesions (fixatrophic changes) can result from chronic stress and inflammatory protein buildup - super glue to tissues
- Leads to reduced movement capacity, pain with stretching, and reduced muscle function
- Decreased function leads to compensation which leads to injuries

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**Training Fascia**

- Hydration, Hydration, Hydration!!!!
- Use of SMR techniques to relieve fixations/adhesions

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**Training Fascia**

- SMR of Superficial Posterior Chain

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**Training Fascia**

- Active Mobilization of Thoracic Spine
- Nerve “flossing” – *Dr. Stu McGill*

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## Training Fascia

- Diagonal spiral integration
- Linear strengthening, focusing on weak points in lines
- Isolation as last resort

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## In Closing...



- Myofascial training integrates anatomy for rehab and injury recovery
- Response to SMR techniques and directed strength training can reduce pain and increase function beyond static stretching and basic strengthening
- Thinking about anatomy in new ways brings new ideas for training and new performance outcomes

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# THANK YOU!!!

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