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**Taso Lambridis**

BSc (Physiotherapy) MSc (Sports  
Medicine)

## Introducing Myofascial Release

Essential Perspectives  
for the Manual Therapist



### Aims & Objectives

- ▶ *What and how of myofascial release?*
- ▶ *Function and role of fascia in the human body*
- ▶ *The world of Myofascial Release*
- ▶ *Why this 3-dimensional body wide matrix is of importance to manual therapists & clinicians*
- ▶ *Stimulate further interest in myofascial system*

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## 1. Introduction

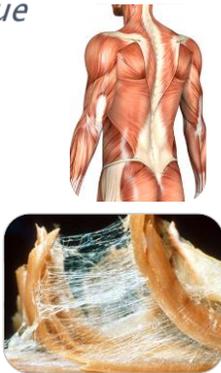
What is fascia?  
And  
So what?

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## The neglected tissue

- ▶ Previously fascial tissue has been ignored
- **not generally portrayed in anatomy books**
- **not often a subject of study in the fields of anatomy or physiology**
- ▶ And fascia has been considered an inert structure



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## The Cinderella of modern medicine

- ▶ A dramatic shift in the scope of medical research to focus on the study of fascia
- ▶ It now has its own identity within medical research

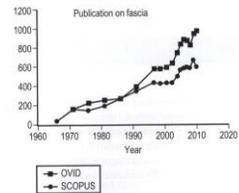


Fig. 0.1 • Number of peer reviewed scientific papers on fascia • Papers on fascia indexed in Ovid Medicine or Scopus have grown from 200 per year in the 1970s and 1980s to almost 1000 in 2010.

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## The scope of connective tissue

Fascia extends to all fibrous connective tissues:

- ▶ Ligaments
- ▶ Tendons
- ▶ Aponeuroses
- ▶ Retinaculae
- ▶ Joint capsules
- ▶ The epineurium
- ▶ The meninges
- ▶ Periosteum

What is fascia? A review of different nomenclatures. Schleip et al 2012  
*Journal of Bodywork and Movement Therapies*

▶ **And all the endomysium and intermuscular fibres of the myofasciae**

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## Fascia presents a new paradigm

- ▶ **The traditional muscle–bone concept gives purely a mechanical model of movement**
- ▶ This is a reductionist approach
- ▶ A one dimensional idea when considering human movement
- ▶ **The reductionist method fails to give us a picture of the fully integrated body when it comes to movement**



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## Fascia presents a new paradigm

- ▶ **The fascial system is often described as a whole body stocking**
- holding and supporting all the muscles and organs
- ▶ Fascia sheds new light on a more accurate representation of body mechanics



**This model looks at the synergistic relationship between structures**

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## 2. Myofascial Structure and Function

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### Muscle and Fascia

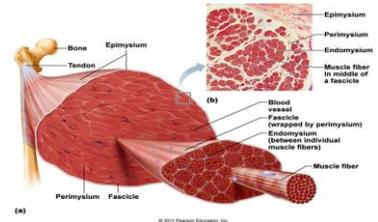
- ▶ The word myofascia describes:
- ▶ **The bundled together inseparable nature of muscle tissue (myo)**
- ▶ **And its accompanying web of connective tissue (fascia)**



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### Muscle and Fascia

- ▶ **Each individual muscle is surrounded by the epimysium**
- a connective tissue layer that is continuous with the tendons attaching the muscle to the bones



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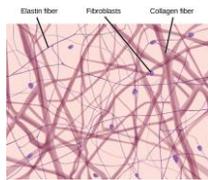
### In summary:

- ▶ Muscle and fascia are biomechanically linked together
- ▶ Endomysium → Perimysium → Epimysium
- ▶ Endomysium } Force Transmission
- ▶ Epimysium }
- ▶ Perimysium: designed for lubrication (not for force transmission)

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## Muscle and Fascia

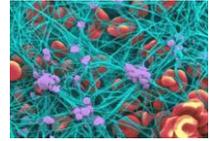
- ▶ These connective tissue layers are composed of **collagen fibres and elastin fibres**
- ▶ **A matrix of hydrated proteoglycans** mechanically links the collagen fibre networks in these structures



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## Muscle and Fascia

- ▶ **The collagen fibres are mechanically stabilized by the formation of cross-links**



- ▶ The cross-links are essential for the mechanical strength and stiffness of the collagen fibres
- ▶ Without them the collagen molecules would slide past each other under load and the fibres would have no strength

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## Myofascia & control of movement

- ▶ Instead muscles distribute a large portion of their contractile or tensional forces onto fascial sheets
- ▶ **These sheets transmit the forces to synergistic and antagonistic muscles**



- ▶ Fascia organizes in directional layers following:
  - **tension and compression**
  - **structural, functional and compensational demands**

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## Fascia & Nociception

- ▶ **Fascia is densely innervated by myelinated nerve endings to serve**
- ▶ **a proprioceptive function**
- Pacini corpuscles, Golgi tendon organs, & Ruffini endings are all present
- ▶ **In addition they are innervated by free nerve endings, containing substance P**
- ▶ **suggestive of a nociceptive function**

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## Fascia the source of pain in fibromyalgia?

- ▶ Patients with FM show evidence of inflammatory mediators in the intramuscular connective tissue
- **Inflammatory markers were primarily found in the interstitial tissue between the muscle fibres**
- **Similar to muscles strained by eccentric muscle action**
- ▶ **The connective tissue surrounding the muscles, not the muscle itself, may be the source of peripheral nociceptive input**
- ▶ **There may be a dysfunctional healing process of the fascia in fibromyalgia**

Liptan, 2010

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## 3. The world of Myofascial Release

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## 1. Structural Integration

- A Philosophy for Myofascial Release

- ▶ Many of the myofascial release approaches originate from the ideas of **Dr Ida Rolf**
- **Structural Integration** (mid-1940's)
- ▶ **Rather than simply working on symptoms she focused on the relationship of parts to the whole**
- ▶ **Ida Rolf gave new insight into the role of connective tissue and considered how this related to:**
- ▶ **Structure and function of the human body**

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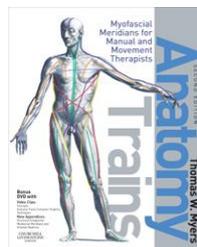
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## 2. The Anatomy Trains®

- ▶ Thomas Myers presents a model of:  
**Functional Interconnectedness**



The Anatomy Trains present a 'longitudinal' view of myofascial anatomy

**The Anatomy Trains maps the major structural and functional continuities in the body's fascial net**

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## 2. The Anatomy Trains®

▶ **Thomas Myers describes 12 sets of distinct lines of dissectible myofascial connections**

- ▶ Superficial Back Line
- ▶ Superficial Front Line
- ▶ Lateral Line
- ▶ Spiral Line
- ▶ The Arm Lines
- ▶ The Functional Lines
- ▶ The Deep Front Line



**The Myofascial Meridians or Anatomy Trains**

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## 2. The Anatomy Trains®

- ▶ The myofascial meridian lines are not acupuncture meridians
- ▶ They are lines of pull based on standard Western anatomy



**Each meridian describes one very precise line of pull through the body**

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## 2. The Anatomy Trains®

- ▶ According to Myers:  
"muscles operate across functionally integrated body wide continuities within the fascial webbing"
- ▶ These meridians of continuous myofascial fibres provide common pathways of:



**Myofascial transmission from one segment to another**

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## 2 Therapeutic applications of Anatomy Trains idea

- ▶ As a way of understanding and mapping global postural patterns
- **Shortness in one line (or in an aspect of a line) pulls on the skeleton to create or maintain postural dysfunction**
- **Causing a chain of compensations along the line or in other lines**
- ▶ If not getting the results you want on a particular structure, try instead releasing structures that are hypertonic elsewhere along the line
- **provides the fascial 'slack'**

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## Extensive citations: A. Stecco and FM® method

- ▶ Histological study of the deep fasciae of the limbs
- ▶ *Expansions of the pectoral girdle muscles onto the brachial fascia*
- ▶ Application of FM® technique in chronic shoulder pain
- ▶ *The ankle retinacula: morphological evidence of the proprioceptive role of the fascial system*
- ▶ The anatomical & functional relation between gluteus maximus and fascia lata
- ▶ *Conservative treatment of carpal tunnel syndrome: comparison between laser therapy and FM®*
- ▶ Mathematical analysis of the flow of hyaluronic acid around fascia during manual therapy motions
- ▶ *Fascial components of the myofascial pain syndrome*

22 citations in Pub Med alone

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## Upper limb fascial continuity

- ▶ A whole series of dissection studies have verified that :
  - **pectoralis major**
  - **biceps brachii and**
  - **palmaris longus muscles**
- ▶ **insert expansions into the brachial and antebrachial fascia**
- ▶ and they follow a constant pattern



Stecco et al 2006, 2007, 2008, 2009

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## 3. Fascial Manipulation©

- ▶ According to the Fascial Manipulation Method:
  - The body can be divided into 14 segments
  - Each body segment is served by six myofascial units
- In the Functional Manipulation© the therapist identifies specific points within a fascial sequence
- Deep massage on specific points aims at restoring tensional balance

**The mainstay of this manual method lies in the identification of a specific, localised area of the fascia in connection with a specific limited movement**

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## 4. Fascial Fitness©

- ▶ Most sports-related overload injuries occur within elements of the fascia loaded beyond their prepared capacity
- ▶ **If one's fascial body is well trained optimally elastic and resilient**
  1. then it may be relied on to perform effectively and
  2. to offer a high degree of injury prevention
- ▶ **The intention of the fascia oriented training is to influence the matrix renewal via specific training activities which result in a more injury-resistant and resilient 'body suit'**
- ▶ Movement practices: plyometrics, gyrokinesis, chi running, yoga or martial arts contain elements congruent with Fascial Fitness©

Schleip & Muller, 2013

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## Other myofascial chains

- ▶ The idea of myofascial or muscle slings is not unique to Thomas Myers
- ▶ Other models show the locomotor system as being one unit that always functions as a whole
- ▶ **Kurt Tittel uses the term 'muscle slings'** to describe the assistance of muscle groups to exert coordinated movements



**In particular the muscular chains that are active in sports activities**



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PHYSIOTHERAPY



## 4. Therapeutic Application of MFR

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Myofascial Release	Other STW
<b>Requires understanding of body wide fascial matrix, functional anatomy</b>	Cultural basis: TCM, Thai-massage, Swedish style, Aromatherapy
<b>Based on fascial anatomy</b>	Non-specific, 'massage by numbers' -Remedial, relaxation massage
<b>Analysis of postural &amp; movement patterns within a fascial web</b>	General postural holding i.e. Upper cross syndrome (Janda)
<b>Often treat away from pain areas Less emphasis on 'knots', TPs</b>	Focuses on tender/tight area (local) Overemphasis on TPs
<b>Lubricant: little to none</b>	Oils, ointments
<b>Application: Deep, firm, slow</b>	Variable speed, depth
<b>Direction: follows lines of fascia</b>	Variable strokes & direction
<b>Involves some dynamic components while applying release technique</b>	Patient, client passive Limited patient interaction
<b>Fully integrated with rehabilitation, functional loading &amp; strengthening fascia</b>	Part of rehab but primarily a passive treatment intervention

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## Therapeutic application

- ▶ An accurate analysis of the myofascial connections based on an understanding of fascial anatomy can provide indications as to where it is best to intervene
- ▶ The localisation of precise points or key areas can render manipulation more effective



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## Proposed mechanism

- ▶ A recent study looked at repetitive motion strain as a modelled injury and demonstrated:
  - **enhanced apoptosis activity**
  - **and loss of intercellular integrity**
- ▶ However **during treatment with MFR** following repetitive strain injury resulted in:
  1. **normalization in apoptotic rate**
  2. **cell morphology changes**
  3. **and reorientation of fibroblasts**

(Meltzer et al., 2010)

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## Proposed mechanism

- ▶ It has been hypothesized that:
- ▶ **Fascial restrictions in one part of the body cause undue tension in other parts of the body**
- ▶ Due to fascial continuity:
- ▶ This may create stress on any structures that are enveloped, divided, or supported by fascia



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### Personal communication Robert Schleip:

- ▶ 'Of course nobody knows for sure, however, my own speculations include:'
- 1. Stimulation of mechanosensory receptors in fascia (Ruffini endings, etc.) with related physiological effects
- 2. A sponge-like alteration (and exchange) of the water content
- 3. Or increased expression of hyaluronan as outlined in the new paper by Stecco et al. 2011
- 4. Stimulation of the affected fibroblasts to change their cytokine production during the subsequent hours/days

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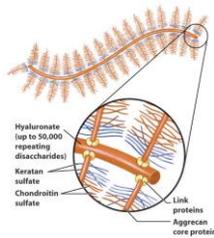
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## Hyaluronan: a basis for myofascial pain

- ▶ If the HA assumes a more packed conformation
- ▶ Or if the loose connective tissue inside the fascia alters its density
- ▶ **Then the behaviour of the entire deep fascia and the underlying muscle would be compromised**

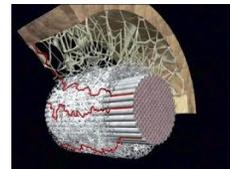


Stecco et al. 2011

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### Where things can go wrong:

- ▶ Adhesion, gluing and lamination in myofascial layers limit:
- ▶ **Motion**
- ▶ **Function**
- ▶ **Mobility**
- ▶ **Motility**
- ▶ This results in adhesions and pulling on adjacent structures



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## 5. Clinical importance of fascia:

- The Thoracolumbar Fascia (TLF)
- Chronic Low Back Pain

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## A role for the TLF in stability

- ▶ The **TLF has received considerable interest** in a role for providing stability to the Lx-pelvic region
- ▶ **The posterior layer of the TLF has an important role in transferring forces between spine, pelvis and legs**
- ▶ **Especially in rotation of the trunk and stabilisation of the lower lumbar spine and SJ**

**Key reference:** *Journal of Anatomy 2012*  
F. H. Willard, A. Vleeming, M. D. Schuenke, L. Danneels and R. Schleip.  
**The thoracolumbar fascia: anatomy, function and clinical considerations**

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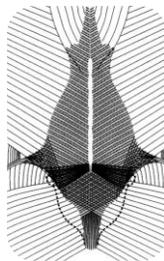
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## The thoracolumbar fascia (TLF)

- ▶ The posterior layer of the thoracolumbar fascia covers the back muscles from the sacral region through to the thoracic region
- ▶ It consists of a superficial and deep lamina which has strong connections at the level of L4-L5
- ▶



Superficial layer TLF

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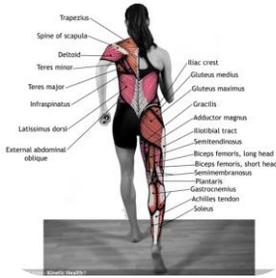
## TLF: A system for tension transmission

- ▶ Anatomical studies demonstrate that the different layers of the TLF are a sophisticated **integrated system for tension transmission**
- ▶ The superficial lamina is tensed by contraction of **latissimus dorsi, gluteus maximus and erector spinae**
- ▶ The deep lamina is tensed by contraction of **the biceps femoris**

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## Functional Importance of the TLF

- ▶ Energizes the posterior oblique muscular sling
- ▶ Connects the trunk to the pelvis and to the lower limbs



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## Changes in fascia in chronic LBP

- ▶ Ultra-sound study: **evidence of altered lumbar connective tissue structure in patients with CLBP**
- ▶ Thickness and echogenicity of the combined subcutaneous and perimuscular zone were significantly greater in the LBP group
- ▶ **Patients with LBP had on average 25% greater perimuscular connective tissue thickening in the lumbar region than subjects with no-LBP** after adjusting for BMI

Langevin et al 2009

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## Reduced shear strain in the TLF and chronic LBP

- ▶ **A further study showed that the TLF shear strain was 20% lower in subjects with CLBP**
- ▶ There was no evidence that this difference was sex-specific although overall males had significantly lower shear strain than females
- ▶ Reduced shear plane motion may be due abnormal trunk movement patterns &/or intrinsic connective tissue pathology

Langevin et al 2011

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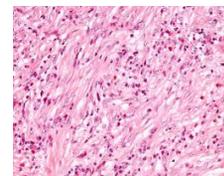
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## Sub-failure injuries of the TLF

- ▶ Studies show that the human lumbar fascia frequently shows signs of increased tissue repair
- ▶ **Histological examination of the TLF in CLBP patients show higher than average density of myofibroblasts**
- **Cells commonly associated with tissue repair function**



Schleip R. et al 2004, 2006

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## The TLF: Manual therapy & exercise

- ▶ Various soft-tissue treatments are directed to the muscle areas adjacent to the TLF
- ▶ Exercise interventions for LBP rely on the functional link the TLF provides between trunk and limbs
- ▶ Through its expansive fascial connections to deeper layers of fascia the TLF has an **important role to play in providing stability:**
  1. **to the lumbo-pelvic region but also**
  2. **to integrate the pelvis & rib-cage**

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## Resources



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## Coming up next

### Exercise in Cancer Patients

**Catherine Granger**  
Physiotherapist

