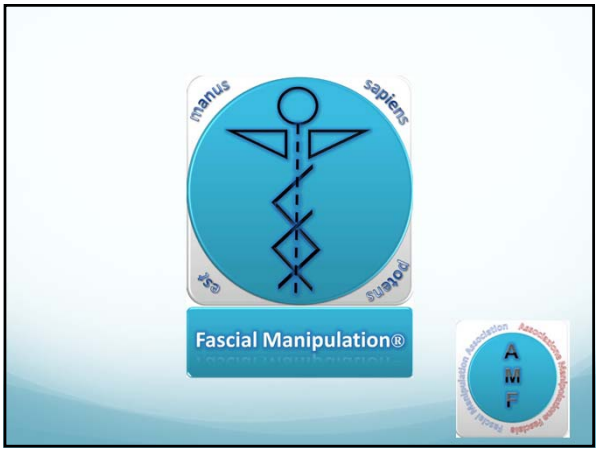
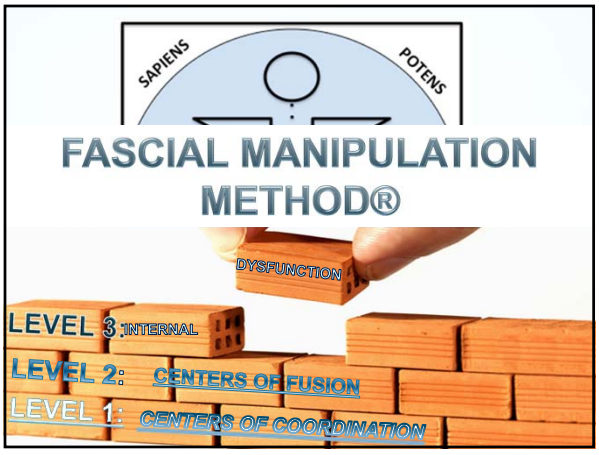
Fascial Manipulation

Carl Heldman PT, DPT, MA, MTC, ATC, FAAOMPT





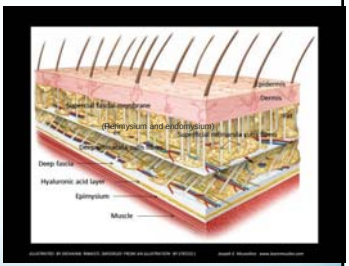
FASCIAL MANIPULATION®

Fascia is a connective tissue: All connective tissue is derived from embryological mesoderm layer

LEVEL 1: DEEP FASCIA AND EPIMYSIAL LAYER

LEVEL 2: DEEP FASCIA AND RETINACULA

LEVEL 3: SUPERFICIAL FASCIA INTERNAL DYSFUNCTION



Manual Therapy 19 (2014) 270–276

Contents lists available at ScienceDirect

Manual Therapy

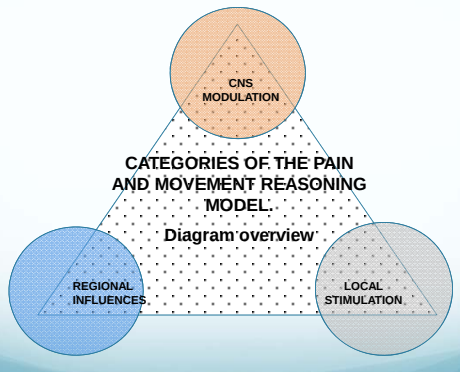
journal homepage: www.elsevier.com/math

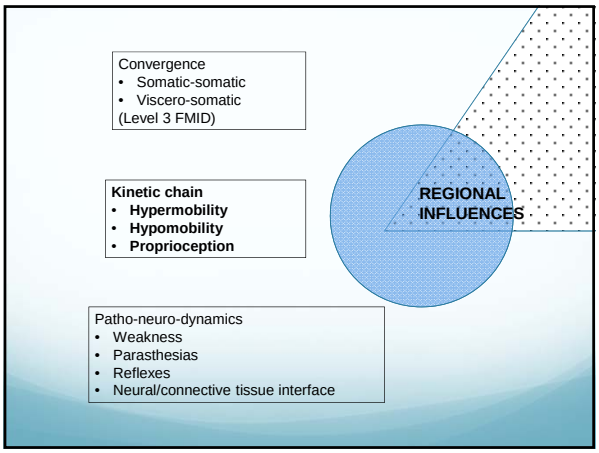
Professional issue

The Pain and Movement Reasoning Model: Introduction to a simple tool for integrated pain assessment

Lester E. Jones [a,*], Desmond F.P. O'Shaughnessy [b]

[a] Department of Physiotherapy, Faculty of Health Sciences, La Trobe University, Melbourne, Australia
[b] Connections Physical Therapy, Alice Springs, Australia





KINETIC CHAIN

SUGGEST DYSFUNCTION REMOTE TO THE SITE OF PAIN

- Biomechanically-related tissues such as proprioception, hypermobility, and hypomobility
- Assumption is that when elements of the "chain" are not providing normal support or alternatively, flexibility, then movement along the chain can be adversely effected
- Takes into consideration that muscles, joints, and connective tissues are a continual matrix and their movements are inter related

UNIVERSITÀ DEGLI STUDI DI PADOVA

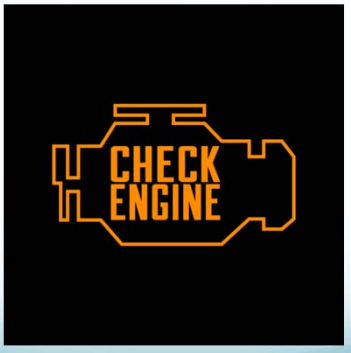
"There is evidence of central nervous system sensitization and of hyperalgesia and temporal summation of pain in a specific area. Another hypothesis would suggest a facilitated processing of pain messages in the central nervous system, perhaps manifested by neural reorganization in the brain, brainstem, and spinal cord."

Younger JW, Shen YF, Goddard G, Mackey SC.; Chronic myofascial temporomandibular pain is associated with neural abnormalities in the trigeminal and limbic systems. ; Pain. 2010 May;149(2):222-8.

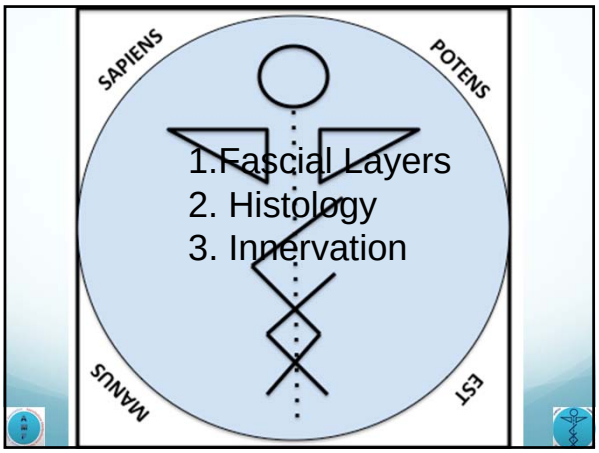
PERIFERAL ORIGIN OF MPS

"The peripheral theory suggests, in contrast, that myofascial pain is due to an alteration of innervations or of nerve stimulation of muscles or of fascia. This theory is based to the hypothesis that the fascia could be considered as a proprioceptive organ, and that it could be altered by trauma, overuse and surgery."

Stecco C, Stern R, Porzionato A, Macchi V, Masiero S, Stecco A, De Caro R; Hyaluronan within fascia in the etiology of myofascial pain.; Surg Radiol Anat. 2011 Dec;33(10):891-6.

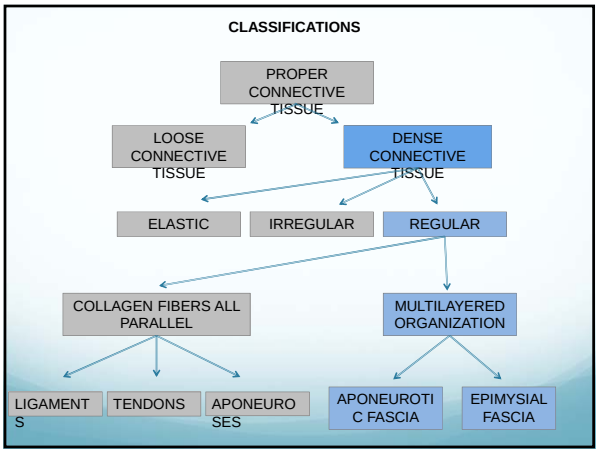


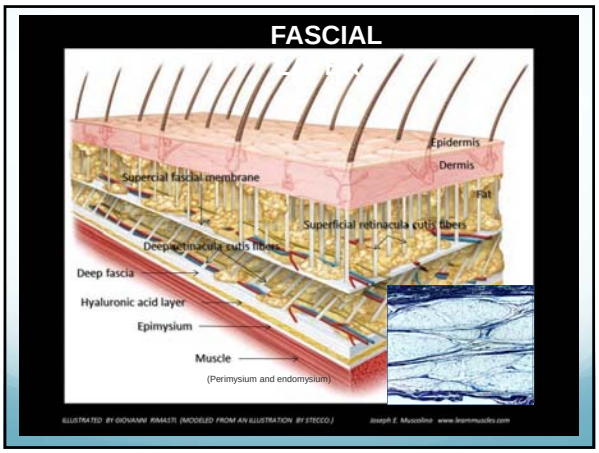
BASIC PRINCIPLES OF FASCIAL MANIPIULATION: FASCIAL ANATOMY



SOME QUESTIONS

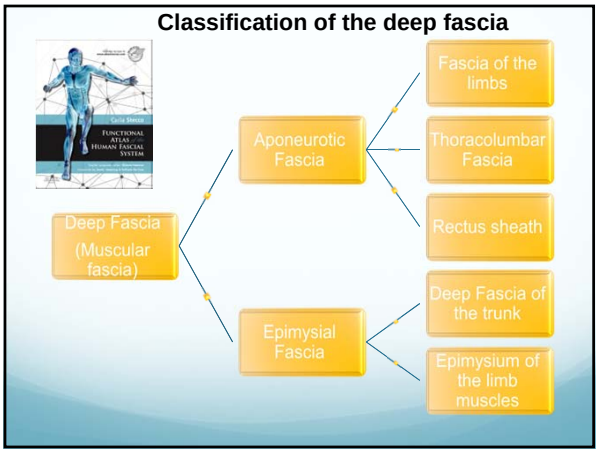
- WHY DO MUSCLES INSERT ONTO OR ORIGINATE FROM FASCIA?
- FASCIA HAS AN INTRICATE STRUCTURE, SO WHY ONLY DESCRIBED AS HAVING A ROLE FOR CONTAINMENT?
- CAN MUSCLES PERFORM MORE THAN ONE MOVEMENT, AND IS FIBER ACITIVATION TASK ORIENTED?
- COULD FASICA PLAY AN ACTIVE ROLE IN MOTOR CONTROL?





SUPERFICIAL FASCIA

- The **retinacula cutis** provide an anchorage of skin to **underlying tissues** and of the **superficial fascia** to the deep fascia.
- In this way a **flexible and yet resistant mechanism of transmission of the mechanical loads** from multi-directional forces could be recognized.
- **Regional specializations** determine the variations in mobility of the skin with respect to underlying tissues.



DEEP FASICA

- NAMED FOR THE SEGMENT IT SURROUNDS; i.e brachia fascia, crural fascia
- LOOKS LIKE A SECOND SKIN BENEATH THE SUPERFICIAL FASCIA

DEEP FASCIA

- IT'S CONTINUOUS WITH LIGAMENTS, RETINACULA, TENDONS AND EPIMYSIUM
- IN PART IT IS FREE TO GLIDE OVER MUSCLES, AND IN PART IT IS FIRMLY ANCHORED TO BONE

DEEP FASCIA

- IT'S INNER SURFACE PROVIDES INSERTIONS FOR MUSCLE FIBERS
- pectoralis major fascia in continuity with the brachial fascia

DEEP FASCIA

Histological study of the deep fasciae of the limbs

Carla Stecco, MD[a], Andrea Porzionato, MD[a], Luca Lancerotto, MD[a], Antonio Stecco, MD[b], Veronica Macchi, MD[a], Julie Ann Day, PT[c], Raffaele De Caro, MD[a,*]

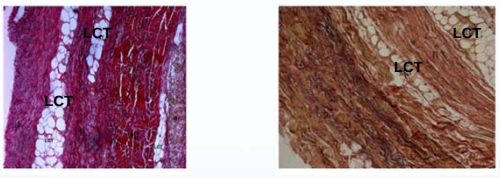
[a]Section of Anatomy, Department of Human Anatomy and Physiology, University of Padova, Via A Gabelli 65, 35127 Padova, Italy
[b]Physical Medicine and Rehabilitation, University of Padova, Padova, Italy
[c]Centro Socio Sanitario dei Colli, Physiotherapy, Azienda Ulss 16, Padova, Italy

Received 31 March 2008; received in revised form 4 April 2008; accepted 28 April 2008

DEEP FASCIA

- UNDULATED PARALLEL COLLAGEN FIBERS, FEW ELASTIC FIBERS ARRANGED IN LAYERS WITH DIFFERENT ORIENTATION
- LOOSE CONNECTIVE TISSUE BETWEEN THE LAYERS

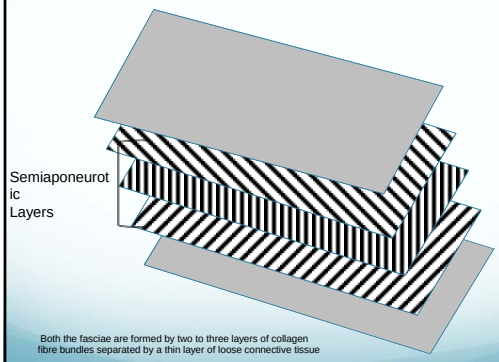
DEEP FASCIA



THIGH ARM

Both the fasciae are formed by two to three layers of collagen fibre bundles separated by a thin layer of loose connective tissue (LCT) that permits the different layers to slide one on the other.

Magnified view

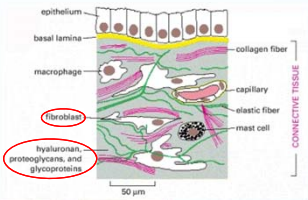


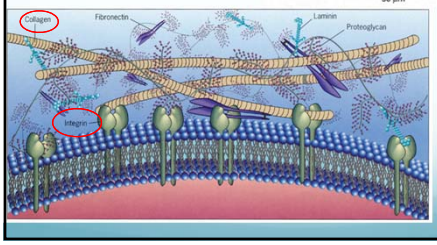
Both the fasciae are formed by two to three layers of collagen fibre bundles separated by a thin layer of loose connective tissue (LCT) that permits the different layers to slide one on the other.

DEEP FASCIA

The presence of loose connective tissue interposed between adjacent layers permits local sliding, and so from a mechanical point of view the single layers could be considered independently.

EXTRACELLUALR MATRIX





FASCIA IS WELL INNERVATED

2007 C Stecco et al. Anatomy of the deep fascia of the upper limb. Second Part: study if innervation. *Morphologie*

Per cm2	Brachial Fascia	Lacertus Fibrosis	Antebrachial Fascia	Flexor retinaculum
Free nerve endings	*48.57*	*27.36*	*44.37*	*53.55*
Pacini Corpuscles	*0.43*	*0.26*	*0.26*	*0.66*
Ruffini Corpuscles	*0.29*	*0.1*	*0.26*	*0.55*

Others agree …
Tesarz J et al 2011 Neuroscience
Sensory Innervation of thoracolumbar fascia in rats and humans
Corey, S.M. et al. 2011 Cell Tissue Organs Sensory
Innervation of the nonspecialized connective tissue in low back of the rat

What we find in fascia

Myelinated Axon

Nonmyelinated n. axon

Scwann cells

MUSCLE SPINDLES

FREE NERVE ENDINGS

Myofibroblast

Elastic fibers

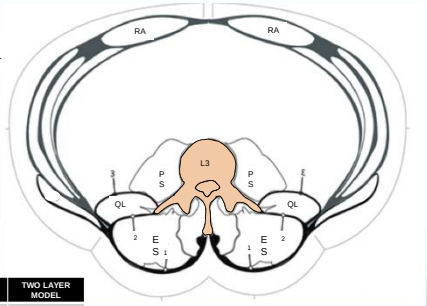
Collagen and Fibroblasts

RUFFINI CORPUSCLES

PACINI CORPUSCLES

THORACOLUMBAR FASCIA

HYPAXIAL MUSCLE COMPARTMNT

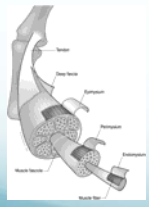


EPAXIAL MUSCLE COMPARTMENT

THREE LAYER MODEL		TWO LAYER MODEL
Posterior layer	1	Posterior layer
Middle layer	2	Anterior layer
Anterior layer	3	Transversalis fascia

Journal of Anatomy
Volume 221, Issue 6, pages 507-536, 27 MAY 2012 DOI: 10.1111/j.1469-7580.2012.01511.x

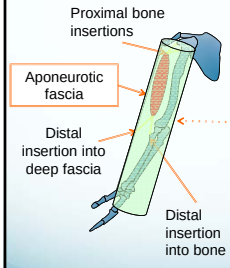
EPIMYSIUM



IN SERIES, AT THE END OF EACH MUSCLE TO FORM THE PARATENON, AND CONTINUES INTO THE PERIOSTEUM

P.P. Purslow / Comparative Biochemistry and Physiology Part A 133 (2002) 947–966

Aponeurotic Fascia Covers the Extremities



Envelopes muscles and connects them by way of myofascial expansions (insertions) around joints. Inserts into the periosteum, paratenon, neurovascular sheath and fibrous capsules of the joints

Slides on muscle due to loose connective tissue between the "Aponeurosis" and **EPIMYSIUM**.

Transmits forces generated by whole muscle.

Connects to underlying muscle only at myofascial expansions. These occur generally at joints and can merge with epimysium and paramysium.

Stecco, C. Functional Atlas of the Human Fascial System. Elsevier 2015, ahead of print
Courtesy of Warren Hammer, DC

Available online at www.sciencedirect.com
SciVerse ScienceDirect
journal homepage: www.elsevier.com/jbmt
ELSEVIER
Journal of Bodywork and Movement Therapies

HUMAN ANATOMY

The anatomical and functional relation between gluteus maximus and fascia lata

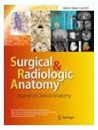
Stecco Antonio, MD [a,*], Gilliar Wolfgang, DO [b], Hill Robert, PhD [c], Brad Fullerton, MD [d], Stecco Carla, MD [e]

[a] Department of Internal Medicine, University of Padova, Padova, Italy
[b] Department of Osteopathic Manipulative Medicine, New York College of Osteopathic Medicine, New York Institute of Technology, Old Westbury, USA
[c] Department of Anatomy, New York College of Osteopathic Medicine, New York Institute of Technology, Old Westbury, NY, USA
[d] The Patient-Physician Partnership, 2714 Bee Caves Road, Suite 106, Austin, TX 78746, USA
[e] Department of Molecular Medicine, University of Padova, Padova, Italy

THE ANATOMICAL AND FUNCTIONAL RELATION BETWEEN GLUTEUS MAXIMUS AND FASCIA LATA

- THE DISTAL INSERTIONS OF THE GLUTEAL MUSCLES ARE MORE FASCIAL THEN OSSEOUS
- SUGGEST THAT VASTUS LATERALIS AND BICEPS FEMORIS WORK TOGETHER TO STABILIZE THE LIMB
- THE FASCIA LATA FORMS THE INTERMUSCULAR SEPTUM BETWEEN HAMSTRINGS AND VASTI
- SEPTUM IS NOT JUST A SEPARATING ELEMENT
- ASSISTS WITH MOVEMENT COORDINATION

Surg Radiol Anat (2009) 31:35–42 DOI 10.1007/s00276-008-0395-5



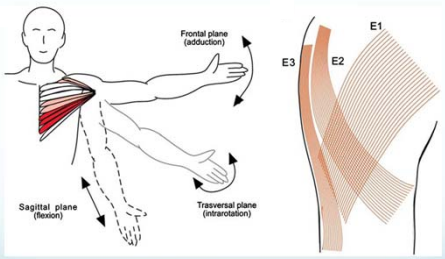
Surg Radiol Anat
DOI 10.1007/s00276-008-0395-5

ORIGINAL ARTICLE

Pectoral and femoral fasciae: common aspects and regional specializations

A. Stecco · V. Macchi · S. Masiero · A. Porzionato · C. Tiengo · C. Stecco · V. Delmas · R. De Caro

Pectoral and femoral fasciae: common aspects and regional specializations



E1- Glute Max
E2 Glute Med
E3- TFL

Surg Radiol Anat (2009) 31:35–42 DOI 10.1007/s00276-008-0395-5

Original Paper

Cells Tissues Organs

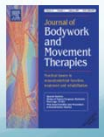
Cells Tissues Organs 2008;188:320–329
DOI: 10.1159/000121433
Accepted after revision: November 15, 2007
Published online: March 19, 2008

The Expansions of the Pectoral Girdle Muscles onto the Brachial Fascia: Morphological Aspects and Spatial Disposition

Carla Stecco[a] Andrea Porzionato[a] Veronica Macchi[a] Antonio Stecco[b]
Enrico Vigato[a] Anna Parenti[c] Vincent Delmas[d] Roberto Aldegheri[e]
Raffaele De Caro[a]

[a]Section of Anatomy, Department of Human Anatomy and Physiology, [b]Physical Medicine and Rehabilitation, and [c]Section of Pathologic Anatomy, Department of Medical Diagnostic Sciences and Special Therapies, University of Padova, Padova, Italy; [d]Department of Anatomy, University Paris René Descartes, Paris, France; [e]Section of Orthopaedics, Department of Medical Surgical Specialties, University of Padova, Padova, Italy

ELSEVIER
Special Section: Series of Fascia Congress Abstracts - Part 3 (pp. 73-92)
Volume 13, Issue 1, January 2009, Pages 53-62
Journal of Bodywork and Movement Therapies
www.intl.elsevierhealth.com/journals/jbmt

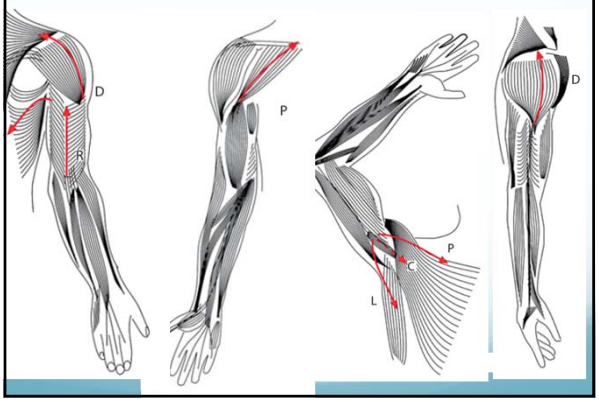


HUMAN ANATOMY

Anatomical study of myofascial continuity in the anterior region of the upper limb

Antonio Stecco[a], Veronica Macchi[b], Carla Stecco[c], Andrea Porzionato[b], Julie Ann Day[d], Vincent Delmas[e], Raffaele De Caro[b,*]

MYOFASCIAL SEQUENCE



ANATOMY OF THE DEEP FASCIA OF THE UPPER LIMB, SECOND PART:STUDY OF INNERVATION (C STECCO ET AL., MORPHOLOGIE 2007)

DUE TO THE INNERVATION (AND STRUCTURE) OBSERVED, *LUIGI AND CARLA STECCO,* HYPOTHESIZED… A PROPRIOCEPTIVE ROLE OF THE DEEP FASCIA

"IT'S STRUCTURE IS IDEAL FOR THE PERCEPTION OF DIRECTION TENSION"

MECHANICAL BEHAVIOR

- MUST CONSIDER THE SUPERFICIAL AND DEEP **RETINACULA CUTIS**
- WITH SKIN MOVEMENT, THE SUPERFICIAL ADIPOSE TISSUE MOVES MORE THAN THE DEEP ADIPOSE LAYER
- IF THE **RETINACULA** ARE **SHORT, STRONG AND VERTICAL** ALLOWS FORCE TRANSMITTED TO THE DEEPER PLANES
- IF THE **RETINACULA** ARE THIN, LONG AND OBLIQUE, THEY HAVE GREATER CAPACITY TO **MUTE** FORCE TRANSMISSION TO DEEPER PLANES
- IMPORTANT TO PROTECTING VESSELS AND NERVES THAT CROSS THE DEEP FASCIA
- MOST NOTABLY, **ASSURES THE RECEPTORS IN THE DEEP FASCIA WILL NOT BE ACTIVATED DURING NORMAL STRETCHING OF THE SKIN**

MECHANICAL BEHAVIOR

- IN ADDITION TO MUTING SKIN STRESSES TO SUBQ TISSUES, **HELP PREVENT HARMFUL EFFECTS FROM MUSCULAR CONTRACTIONS TO THE SKIN**
- NORMALLY WHEN MUSCLE CONTRACT THEY SLIDE EASILY UNDER THE SUBQ TISSUES AND THE SKIN IS NOT INVOLVED
- OCCURS BECAUSE, **MUSCLE MOVEMENT ALWAYS STRETCHES SPECIFIC PORTIONS OF THE DEEP FASCIA,** AND THEIR ACTION INTO THE SKIN IS MITIGATED BY THE **DAT** AND THE **SUPERFICIAL FASCIA**

MECHANICAL BEHAVIOR

- RETINACULA CUTIS MUST BE FUNCTIONING NORMALLY FOR SLIDE GLIDE AND SEPARATION BETWEEN DF AND SF
- ALLOWS FOR SEPARATION OF ROLES
- SUPERFICIAL FASCIA- **THERMOREGULATORY, LYMPHATIC FLOW, VENOUS/ARTERIAL PROTECTION, NERVE PATHWAYS TO PERIPHERY**
- DEEP FASCIA- **PROPRIOCEPTION, PERIPHERAL MOTOR CONTROL**
- DEEP ADIPOSE TISSUE (DAT) FEWER NERVES, SERVES AS A **WATERSHED** BETWEEN THE **EXTEROCEPTIVE** AND THE **PROPRIOCEPTIVE** SYSTEMS
- **WHERE THE DAT DISSAPEARS, AND THE DEEP FASCIA AND SUPERFICIAL FASCIA FUSE, THE EXTEROCEPTIVE AND PROPRIOCEPTIVE SYSTEMS UNITE**
- **REASON FOR HAND AND FOOT DEXTERITY**-FACILITATES PERCEPTION OF FORM, VOLUME, AND STRUCTURE GUARANTEEING ADEQUATE MOVEMENT

MECHANICAL BEHAVIOR

- **WHAT HAPPENS WHEN THERE IS NOT NORMAL SLIDE/GLIDE BETWEEN THESE LAYERS?**
- **WHAT HAPPENS WHEN A SCAR FORMS AND JOINS THE SUPERFICIAL FASCIA WITH THE DEEP FASCIA?**
  - IN THESE SITUATIONS WHERE DENSE AND/OR FIBROUS TISSUE IS "FUSING" TOGETHER SKIN, SF AND DF
  - STRETCHING THE DEEP FASCIA COULD AFFECT THE SUPERFICIAL FASCIA AND VICE VERSA.
  - IN THESE CASES, EVEN NORMAL MUSCLE CONTRACTION OR SKIN STRETCHING COULD RESULT IN **OVERSTIMULATION** OF EXTEROCEPTORS AND/OR PRIOPRIOCEPTORS

SO…..

- Fascia is an intricate structure
- Muscles insert onto and originate from fascia
- Could play an active role in motor control

FASCIAL MANIPULATION ADOPTING REASONING AND ASSESSMENT BASED ON:

DIRECTION OF MOVEMENT

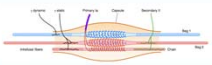
CLASSICAL ANATOMY
HAS SOME CONTRADICTIONS WITH REGARDS TO MOVEMENT DIRECTION AND TERMS

- I.E. HIP **FLEXION** OCCURS IN THE SAME DIRECTION AS KNEE **EXTENSION**
- PRONATION/SUPINATION ARE SIMILAR TO INVERSION/EVERSION

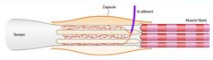
Traditionally we think that our motor cortex refers to muscles with origins and insertions that move bones… but we will see how thinking in terms of movement direction serves us better

PROPRIOCEPTION

BUILDING BLOCKS



MUSCLE SPINDLE



GOLGI TENDON ORGAN

JOINT REPLACEMENT SURGERY
-CAPSULE REMOVED

JOINT RECEPTORS

- -PRIMARILY AT END RANGE, "LIMIT DETECTORS"
- UNABLE TO SIGNAL DIRECTION OF MOVEMENT OR POSITION IN "NORMAL RANGE"
- SLOW RESPONDING

SKIN RECEPTORS

- 4 TYPES OF RECEPTORS
- SKIN STRETCH ALONE COMMONLY PRODUCED ILLUSORY MOVEMENTS


THE PROPRIOCEPTIVE SENSES: THEIR ROLES IN SIGNALING BODY SHAPE, BODY POSITION AND MOVEMENT, AND MUSCLE FORCE

Uwe Proske and Simon C. Gandevia

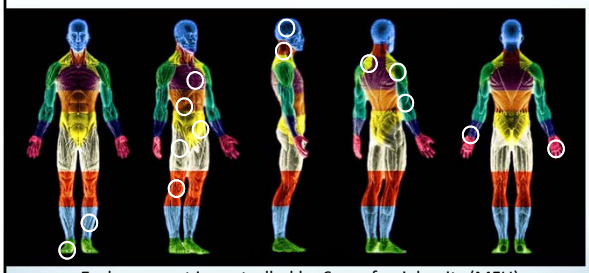
Department of Physiology, Monash University, Victoria, Australia, and Neuroscience Research Australia and University of New South Wales, Sydney, Australia

- CNS CONCEIVES MOVEMENTS AS FINALIZED GETSURES OR PATTERNS OF MOVEMENTS, STORED AS MULTIPLE REPRESENTATIONS IN THE CEREBRAL CORTEX, AND NOT IN SINGLE MUSCLE ACTIVITY
- THE NERVOUS SYSTEM INTERPRETS AND PROGRAMS MOVEMENTS IN TERMS OF SPATIAL DIRECTIONS AND ANGLES

MOTOR EQUIVALENCE

FINAL GESTURES

Defining new boundaries on the human body



Each segment is controlled by 6 myofascial units (MFU)
In 6 directions- 3 spatial planes

THE MYOFASCIAL (MF) UNIT

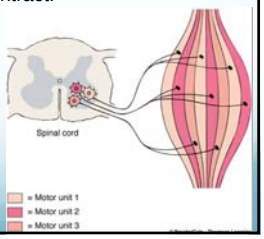
1. **Motor units**, innervating fibres in **monoarticular** and **biarticular** muscles, to move a body segment *in a specific direction*
2. the joint that is moved
3. nerve and vascular components
4. the fascia that connects these elements together

MOTOR UNITS INNERVATE MUSCLE FIBRES

A Motor Unit = one alpha-motorneurone and the muscle fibres it innervates.

May innervate 10 to 1000 muscle fibres.

When activated all of its fibres contract.



PARTITIONING HYPOTHESIS

Clinical Anatomy 25:366–372 (2012)

ORIGINAL COMMUNICATION

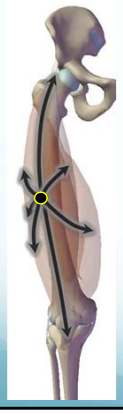
Neuromuscular Partitioning in the Extensor Carpi Radialis Longus and Brevis Based on Intramuscular Nerve Distribution Patterns:
A Three-Dimensional Modeling Study

MAYOORENDRA RAVICHANDIRAN,[1]* NISANTHINI RAVICHANDIRAN,[1] KAJEANDRA RAVICHANDIRAN,[1] NANCY H. MCKEE,[2] DENYSE RICHARDSON,[3] MICHELE OLIVER,[4] AND ANNE M. AGUR[1]

[1]Division of Anatomy, University of Toronto, Toronto, Ontario, Canada
[2]Division of Plastic Surgery, Department of Surgery, University of Toronto, Toronto, Ontario, Canada
[3]Department of Medicine, Division of Physiatry, University of Toronto, Toronto, Ontario, Canada
[4]College of Physical and Engineering Science, School of Engineering, University of Guelph, Guelph, Ontario, Canada

THE MYOFASCIAL (MF) UNIT

Each mf unit has a:



- **Centre of Coordination (CC)** where vectors from muscle fibre contraction converge.

- **Centre of Perception (CP)** where movement occurring at the joint is perceived

Anterior knee joint

CENTER OF PERCEPTION (CP)

Each MFU has a CENTER OF PERCEPTION (CP), where movement occurring at the joint is perceived.

- A vectoral center
- Resultant traction onto the joint capsule, tendons and ligaments

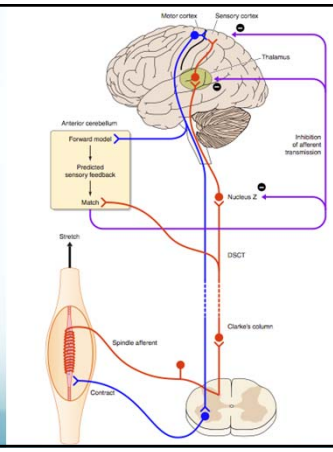
A CP can become painful if,

- the unidirectional forces of the MFU are not synchronized
- Mechanoreceptors in the capsule, ligaments and tendons are subjected aberrant forces

CENTERS OF COORDINATION HYPOTHESIS

COULD BE POSSIBLE BECAUSE:

1. Part of the deep fascia is fixed to bone
2. Part of the deep fascia is free to glide
1. The fascia is tensioned by myotendinous insertions onto the fascia, and muscle fibers inserting directly onto fascia



FUNCTION OF THE MYOFASCIAL UNIT

THE **CC** OF A SEGMENT CORRESPONDS TO THE CENTER OF VECTORS FORMED BY THE CORRECT:

- TRACTIONS FROM MUSCLE FIBERS OF THAT MOTOR UNIT
- TENSION THROUGH THE ENDOMYSIUM AND PERIMYSIUM
- TENSION OF THE LOCAL SEGMENT OF DEEP FASCIA (APONEUROTIC FASCIA OR EPIMYSIAL FASCIA)

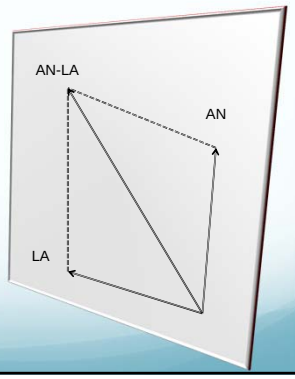
"A PHYSIOLOGICAL SLIDING SYSTEM IN THE CC IS NECESSARY TO CREATE A CORRECT FINAL VECTOR"

CENTER OF FUSION (CF)

- CC-REGULATES UNIDIRECTIONAL MOTOR UNITS OF A SINGLE MFU
- CF-COORDINATES INTERMEDIATE MOTOR UNITS, ACTIVATED DURING MOVEMENT BETWEEN MFUs IN DIFFERENT SPATIAL PLANES
- FASCIA ACTS AS A RHEOSTAT/REGULATOR FOR ACTIVATION

DIAGONALS

CFs coordinate decreasing activity of one MFU and increasing activity of another.



DIAGONALS

- A DIAGONAL IS A SERIES OF CENTERS OF FUSION THAT COORDINATE TWO ADJACENT SEQUENCES DURING A MOVEMENT IN AN INTERMEDIATE DIRECTION

CF LOCATIONS

CENTERS OF FUSION ARE LOCATED IN:

- THE RETINACULA NEAR JOINTS,
- THE TENDONS, AND
- THE TRUNK, ALONG LINES OF UNIONS OF SOME MUSCLES

DIFFERENCES BETWEEN CCs and CFs

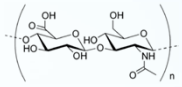
CENTERS OF COORDINATION

- OVER MUSCLE BELLIES
- ALONG LINES OF SPATIAL PLANES
- RECRUITED BY FORCEFUL UNIDIRECTIONAL MOVEMENTS

CENTERS OF FUSION

- OVER RETINACULA AND PERIARTICULAR STRUCTURES
- INTERMEDIATE POSITIONS
- RECRUITED BY GESTURES OR COMPLEX MOVEMENTS

Hyaluronic Acid



- **HA** is a large simple carbohydrate polymer of the ECM
- differs from other GAG in ECM as has no protein
- **HA** acts as a hydrating, space filling polymer
- Located within and between the interface of tissues (i.e deep fascia layers, muscle spindle capsule)
- **A LUBRICANT for fascia to glide**
- **Under conditions of stress**, **HA becomes depolymerized- PROMOTES IMFLAMMATION**
- (inflammatory phase of wound repair is abundant in HA)
- **HA acts as a promoter of early inflammation, which is crucial in the whole skin wound-healing process,** W. Y. John Chen and Giovanni Abatangelo, Wound Repair and Regeneration, 1999, 7: 79–89

DIFFERENCES

FIBROSIS-

- fibrotic tissue whenever the dense connective tissue component is altered
- correlates with a macroscopic rearrangement of the composition and conformation of the entire fascia tissue.

DENSIFICATION-

- alteration of the loose connective tissue (adipose cell, GAG, and HA). Can involve one or all three.
- alteration of the quantity or quality of the component of the loose connective tissue may change the viscosity and therefore the function of the lubricant that the loose connective tissue facilitates

DYSFUNCTION

- **VISCOSITY CHANGE**
- **DECREASED GLIDE**
- **CHANGE IN VECTOR**
- **JOINT INCCORDINATION**
- **COMPENSATION**
- **SYMPTOMS**

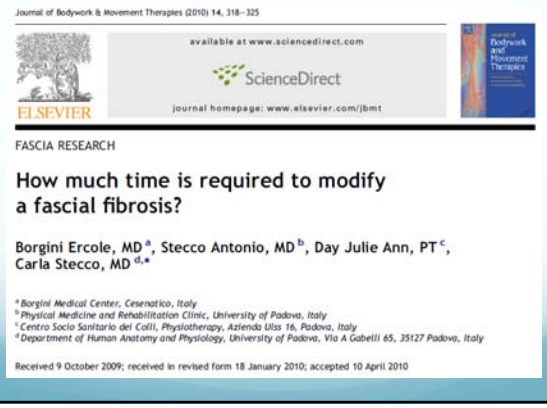
SEQUENCES OF MYOFASCIAL UNITS

- "3 dimensional movement and stabilization of each segment is guaranteed by synergy and synchrony between the proximal and the distal, and the agonist and the antagonist MF units"
- "Unidirectional MF units linked by myofascial insertions form the **myofascial sequences**"

TECHNIQUE

- **Elbow, knuckles or fingers adhere to the skin**
- **Pressure must be sufficient enough to cross loose connective tissue**
- **DEEP FASCIA AND IT' S DERIVATIVES ARE THE TARGET TISSUE**
- **Treatment is applied away from the site of pain**
- **Visualize muscle anatomy and bony landmarks to locate deep fascia to be treated.**

TREATMENT TIME



Journal of Bodywork & Movement Therapies (2010) 14, 318–325

available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/jbmt

ELSEVIER

FASCIA RESEARCH

How much time is required to modify a fascial fibrosis?

Borgini Ercole, MD [a], Stecco Antonio, MD [b], Day Julie Ann, PT [c], Carla Stecco, MD [d,*]

[a] Borgini Medical Center, Cesenatico, Italy
[b] Physical Medicine and Rehabilitation Clinic, University of Padova, Italy
[c] Centro Socio Sanitario dei Colli, Physiotherapy, Azienda Ulss 16, Padova, Italy
[d] Department of Human Anatomy and Physiology, University of Padova, Via A Gabelli 65, 35127 Padova, Italy

Received 9 October 2009; received in revised form 18 January 2010; accepted 10 April 2010

HYALURONIC ACID

- 0-15min

Onset of inflammatory reaction

- 15min-12h

Increase in inflammatory reaction: Heat, edema. pain

- 12h-24

Peak of inflammatory reaction

- 24h

Resolving of inflammatory reaction

The smallest products of the HA catabolic cascade can turn about and suppress the action of of larger predecessors, and thereby modifying their effects

Stern R 2006

THANK YOU

For More Information

- www.fascialmanipulation.com
- www.myopainseminars.com
- myofascialphysiocare@gmail.com