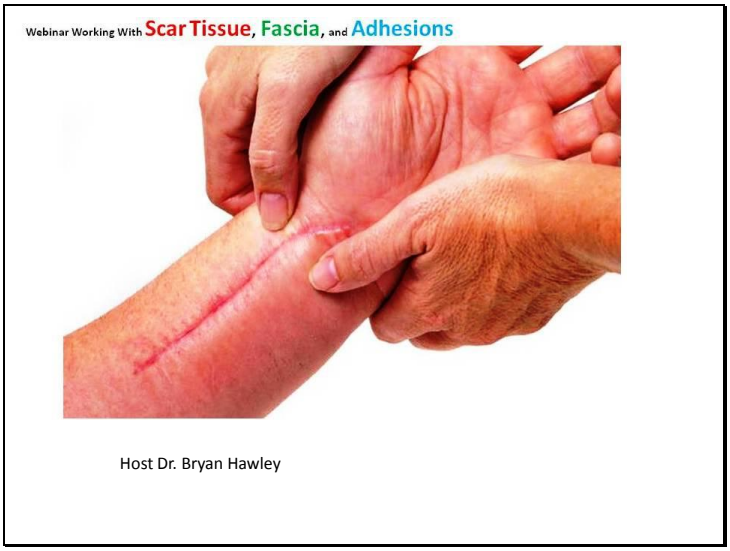
Slide 1


Webinar Working With Scar Tissue, Fascia, and Adhesions
Host Dr. Bryan Hawley

Slide 2

Housekeeping

- Questions
- Who am I
- Notes
- Recordings
- Certificates/Tests
- info@drbryanhawley.com
- Lets begin

Slide 3

Slide 4

Slide 5

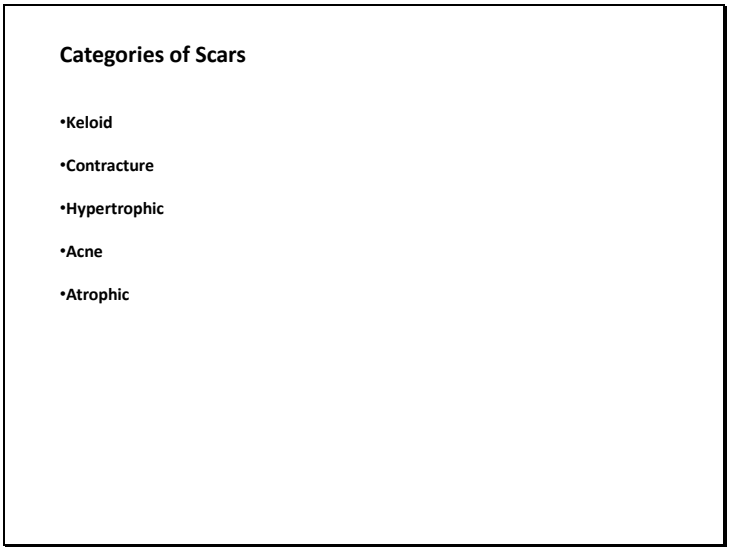
What is Scar Tissue?

Scar tissue forms after injury to the normal collagen cells in the body. If you cut yourself, have surgery, or tear tissue in the body, scar tissue will develop. The development of scar tissue is part of the normal healing process in the body

Scar tissue is composed of the same protein (collagen) as the tissue that it replaces, but the fiber composition of the protein is different; instead of a random basketweave formation of the collagen fibers found in normal tissue, in fibrosis the collagen cross-links and forms a pronounced alignment in a single direction.

NOTE: Sweat glands and hair follicles do not **form** in **scar tissue**

Slide 6


Categories of Scars
•Keloid
•Contracture
•Hypertrophic
•Acne
•Atrophic

Slide 7

Keloid scars. These scars are the result of an overly aggressive healing process. They extend beyond the original injury. Over time, a keloid scar may hamper movement. Treatments include surgery to remove the scar, steroid injections, or silicone sheets to flatten the scar. Smaller keloids can be treated using cryotherapy (freezing therapy using liquid nitrogen). You can also prevent keloid formation by using pressure treatment or gel pads with silicone when you are injured. Keloid scars are most common among people with dark skin

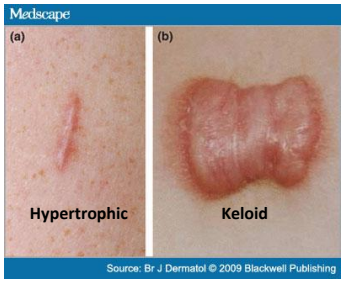
Slide 8

Contracture scars. If your skin has been burned, you may have a contracture scar. These scars tighten skin, which can impair your ability to move. Contracture scars may also go deeper, affecting muscles and nerves.

Slide 9

Hypertrophic scars. These are raised, red scars that are similar to keloids but do not go beyond the boundary of the injury. Treatments include injections of steroids to reduce inflammation or silicone sheets, which flatten the scar.

Hypertrophic scars are often distinguished from keloid scars by their lack of growth outside the original wound area, but this commonly taught distinction can lead to confusion



Slide 10

Acne **scars.** If you've had severe acne, you probably have the scars to prove it. There are many types of acne scars, ranging from deep pits to scars that are angular or wavelike in appearance.

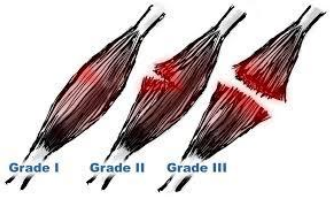
Slide 11

Atrophic scarring (sunken scarring), which also has an over expression of collagen blocking regeneration. This scar type is sunken, because the collagen bundles do not overextend the tissue. Stretch marks (striae) are regarded as scars by some

Slide 12

INJURIES

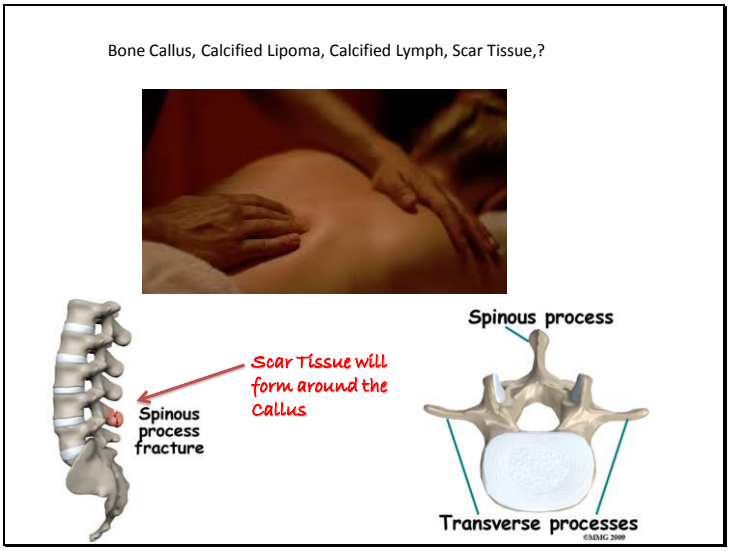
If muscles and tendons were cut or repaired, scar tissue will develop there. After injury like a hamstring tear or rotator cuff tear, scar tissue will develop in the muscle as it heals.



Bony scar tissue, called a callus, will form on bone after a fracture. Scar tissue is the body's normal method for healing body parts that are injured.

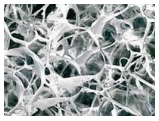
So How is it relevant to Massage?

Slide 13

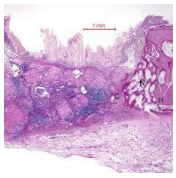

Bone Callus, Calcified Lipoma, Calcified Lymph, Scar Tissue,?
Scar Tissue will form around the Callus
Spinous process fracture
Spinous process
Transverse processes
©MMG 2009

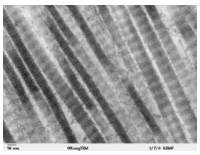
Slide 14

What is Collagen?
Collagen is a substance that is present in all of our body parts. There is collagen in muscles, tendons, and ligaments. There is also collagen in skin and bones.
The cellular makeup of collagen makes it very strong due to the alignment of collagen cells. It can resist tensile forces, such as stretching and pulling, without tearing or breaking.



Fibroblasts





Slide 15

To begin to patch the damage, a clot is created; the clot is the beginning process that results in a provisional matrix. In the process, the first layer is a provisional matrix and is not scar. “cap on the clot”

Over time, the wounded body tissue then over expresses collagen inside the provisional matrix to create a collagen matrix. This collagen over expression continues and cross links the fiber arrangement inside the collagen matrix, making the collagen dense.

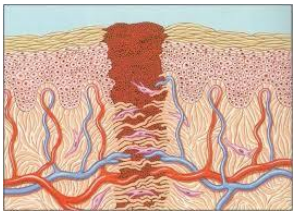
This densely packed collagen, morphing into an non-elastic whitish collagen scar wall, blocks off cell communication and regeneration; as a result, the new tissue generated will have a different texture and quality than the surrounding unwounded tissue.

The scarring is created by fibroblast proliferation, a process that begins with a reaction to the clot.
To mend the damage, fibroblasts slowly form the collagen scar. The fibroblast proliferation is circular and cyclically, the fibroblast proliferation lays down thick,
whitish collagen inside the provisional and collagen matrix, resulting in the abundant production of packed collagen on the fibers giving scars their uneven texture.

Slide 16

Oftentimes, the areas where scar tissue and adhesions have formed are considerably more painful than they were before surgery. Nerves can be entrapped within or between the adhesions and scar tissue causing painful inflammation, and the affected areas are prone to strain injuries due to lack of flexibility especially if they cross a joint.

Forming scar tissue fans out like a web binding and adhering to all layers of fascia to stabilize the weakened areas from the laceration.



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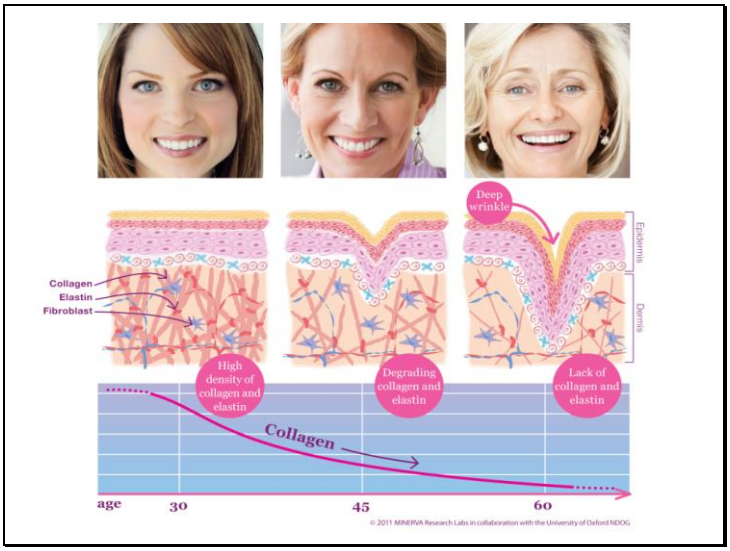
Deep wrinkle
Epidermis
Dermis
Collagen
Elastin
Fibroblast
High density of collagen and elastin
Degrading collagen and elastin
Lack of collagen and elastin
Collagen
age
30
45
60
© 2011 MINERVA Research Labs in collaboration with the University of Oxford NDDG

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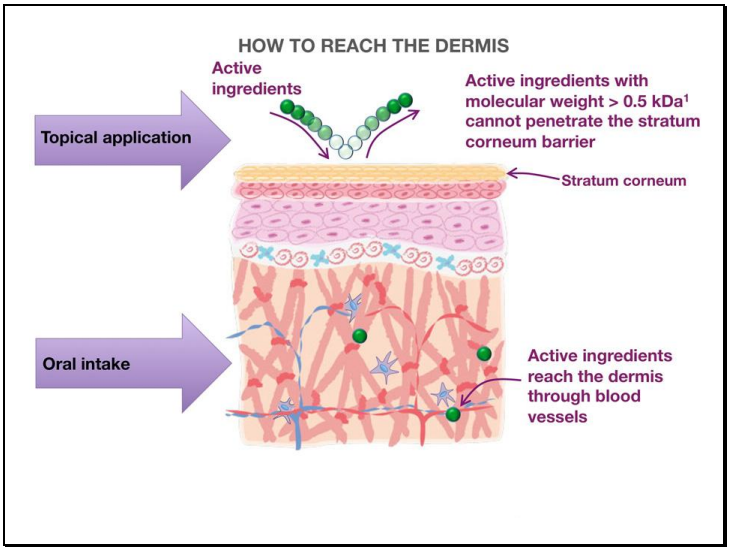

HOW TO REACH THE DERMIS
Active ingredients
Active ingredients with molecular weight > 0.5 kDa[1] cannot penetrate the stratum corneum barrier
Topical application
Stratum corneum
Oral intake
Active ingredients reach the dermis through blood vessels

Slide 19

Slide 20

Is Scar Tissue Permanent?

Scar tissue is not a permanent fixture in the body. After scar tissue forms and healing has taken place, the scar needs to be remodeled so that it can tolerate the stress and forces that the body may encounter throughout each day. The remodeling process is essential to ensure that normal ROM and Strength, and mobility are restored to the injured tissue.

Slide 21

The scar tissue protocol includes a four-step approach:

First stroke to release the fluids and toxins and relax the surrounding tissues to reduce the pressure on the scar tissue and adhesion and release some of the sensation in the area.

The second step is directed myofascial unwinding strokes that involve slow, constant, steady pressure that only move as the tissue releases. Due to the multi-directional aspect of scar tissue and adhesions, these strokes are applied in any direction that adhesions can be felt. Sometimes the stroke directions may cover as many directions as the lines found in an asterisk. *

The third step is applying specific individual fiber strokes. These strokes are very slow and only move with the release of tissue, usually moving along the fibers since the directed myofascial unwinding strokes have already spread the fibers apart.

The fourth and final step is repeat of Step 1

Slide 22

Remember Scar tissue

Scare tissue does not have the same tensile strength Circulation or nerve supply as non scarred tissue. It is also less flexible. We need to use caution when trying to stretch it.

Arch Orthop trauma Surg. 104 (6):366-370, 1986 Lehto M Jarvinen M., Nelimarkka.

Slide 23

Massaging a scar that is not fully healed can cause damage to the developing scar tissue and this can delay healing. In general, the scar must be fully closed and no scabbing present to begin scar massage.

Slide 24

Effleurage massage to soften the scar tissue. Drainage techniques should not hurt or make the scar redden.

•Gentle, circular, draining motion within the scar itself.

•A semi firm stretch to the skin both sides of the scar. First in a straight line, and then in a circular motion: these are two drainage techniques.

•Placing the fingers on the scar, then making gentle, circular, pumping motions on the scar that help drain congested lymph fluid.

NOTE: Start first at Periphery of scar and work inwards towards scar.

Slide 25

Myofascial Release helps ease constriction of the affected tissue.

•Stretch the skin next to the scar. Place two or three fingers at the beginning of the scar and stretch the skin above the scar in a parallel direction. Then move the fingers 6 mm further along the scar, and repeat the stretch all the way along the scar.

.An alternative method is using a circular motion instead of straight stretches. Work along the scar in a clockwise and anticlockwise fashion.

Slide 26

Deep Transverse Friction

This can prevent adhesion formation and break down unwanted adhesions.

•Applied directly to the lesion and transverse to the direction of the fibers.
•This deep tissue massage technique can have very good results in a mature or immature scar.
•Never progress beyond a comfort level

Slide 27

Transverse Friction Massage

- Technique for treating chronic tendon inflammation
- Purpose is to increase inflammatory response to progress healing process
- Use strong pressure in perpendicular direction to fibers for 7 to 10 minutes every other day

Slide 28

Transverse Friction Massage,. otherwise known as TFM, is a deep tissue technique that is performed at the site of the injury in order to breakdown scar tissue and remodel it to be a more flexible, pliable, and a more functional tissue.

TFM protocols and procedures were originally investigated and documented by James Cyriax, an english medical doctor. Numerous research studies have been performed since Cyriax's original work to investigate why TFM is so effective. This research has shown that TFM directly affects the manner in which tissue heals.

When an injury occurs it is healed by the formation of scar tissue, this scar tissue covers the damage in all different directions and therefore is not very flexible or functional. TFM breaks down the scar tissue that naturally forms when tissue is damaged, either by an acute injury or by repetitive microtrauma. This tissue breakdown allows the tissue to heal in a more functional way. This is accomplished by combining tissue breakdown with muscle lengthening procedures, such as ART, and with specific rehabilitation exercises. This combination allows the tissue to heal with a greater percentage of normal tissue, and the scar tissue that does form will be laid down in the same direction as the normal tissue fibers, making it more functional and flexible.

Slide 29

Lubrication of the scar helps soften it and increase its pliability.
•Mediums such as lotion, castor oil, vitamin E oil, essential oils or other oils can prevent the scar from drying out and re-opening.

•Lavenders healing properties was discovered during a burning incident.

Gattefossé's burn
"In 1910 French chemist and scholar René-Maurice Gattefossé discovered the virtues of the essential oil of lavender. Gattefossé badly burned his hand during an experiment in a perfumery plant and plunged his hand into the nearest tub of liquid, which just happened to be lavender essential oil. He was later amazed at how quickly his burn healed and with very little scarring. This started a fascination with essential oils and inspired him to experiment with them during the First World War on soldiers in the military hospitals."

Slide 30

Stretching aids in increasing range of motion. **ART/PNF Stretching**

•This is most important when approaching scars that cross over a joint.
•Scar tissue will lengthen after being stretched, especially if the stretch is sustained for several seconds and is combined with massage

Slide 31

Stretching styles we use

PNF

Myo Fascial

ART

Slide 32

PNF Stretching

What is PNF Stretching?

Proprioceptive Neuromuscular Facilitation (PNF) is a more advanced form of flexibility training that involves **both** the stretching and contraction of the muscle group being targeted.
PNF stretching was originally developed as a form of rehabilitation, and to that effect it is very effective. It is also excellent for targeting specific muscle groups, and as well as increasing flexibility, it also improves muscular strength.

Slide 33

Slide 34

PNF Stretching (2 styles)

Contract Relax: Passive placement of the restricted muscle into a position of stretch followed by an isometric contraction of the restricted muscle. Most isometric contractions in PNF stretching techniques should be held for a minimum of 3 seconds at a sub maximal effort (20-50% of maximal effort) to avoid muscle fatigue and injury. After the contraction period the patient is instructed to relax the restricted muscle that was just contracting and activate the opposing muscle to move the limb into a greater position of stretch. Through Golgi tendon organ, the tight muscle is relaxed, and allowed to lengthen.

Hold Relax: Very similar to the Contract Relax technique. This is utilized when the agonist is too weak to activate properly. The patient's restricted muscle is put in a position of stretch followed by an isometric contraction of the restricted muscle. After the allotted time the restricted muscle is passively moved to a position of greater stretch. Contraction times and efforts will remain the same as the Contract Relax technique. This technique utilizes the reciprocal inhibition, which relaxes a muscle after a sustained contraction has been applied to it for longer than 6 seconds.

Slide 35

Myofascial vs Traditional

Traditional stretching is two-dimensional (although our body, of course, is three-dimensional) and typically involves stretching a muscle over a joint and involves holding the stretch for a brief period of time (15-30 seconds). Traditional stretching addresses the muscle and the elastic tissue, but not the collagenous, firmer component of our connective tissue.

Myofascial Stretching differs from conventional stretching
-Time element: Myofascial Stretches are held continuously for at least 90-120 seconds. This is how long it takes for the fascia to begin to let go. Shorter stretches do not affect the collagenous aspect of the fascia (connective tissue) and therefore lead to only temporary, partial results.

Slide 36

ART Vids

The basic premise is simple, just not easy. Shorten the tissue, apply a contact tension and lengthen the tissue or make it slide relative to the adjacent tissue.

Knee http://www.youtube.com/watch?v=7V0YKyKzYd4

Hamstring http://www.youtube.com/watch?v=M08a3MCK6zo

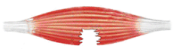
Piriformis https://www.youtube.com/watch?v=8Z_Vpxkb3Ic

Slide 37

Scar Tissue

How Scar Tissue Forms In Muscles

1 Muscle Tears

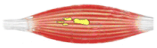


An Injury like Whiplash
Or a sporting Injury

The body senses the tear and repairs the break with scar tissue

2 Micro-Tears In Muscles

Repetitively using a muscle resulting in small tears of the muscle fibres



The body senses the micro-tears and repairs them with scar tissue

3 Sustained Contraction

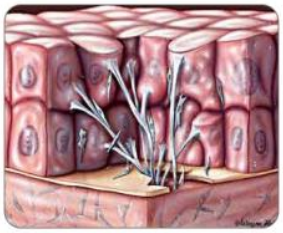
Normal Muscle cut through the middle

Muscles held in tension for long amounts of time e.g from bad posture or working on a Computer

Because the muscle is held tight blood can't get to all the parts of the muscle. The part that doesn't get enough Oxygen dies and scar tissue forms.

Slide 38

Scar tissue can also bind muscle fibers together. The inflexible **scar tissue limits the movement** of your muscles that were once elastic leaving your tissue weaker than a healthy muscle and at greater risk of deterioration and possible tearing.



Slide 39

Heat Application helps the pliability and flexibility of the scar.

•Use moist heat if possible (such as a wet washcloth warmed up in the microwave), as it will draw more fluids to the area and encourage the muscle to return to its natural state. (Not so hot that it burns you.)

Slide 40

Gua Sha

Gua Sha is an Eastern Asian healing technique used to treat colds, flu, stasis of chi, sluggishness, migraines, poor circulation, etc. as well as aching and tenderness in the muscles. ***Gua*** means to scrape or rub. ***Sha*** is a reddish skin rash with petechiae (looks like tiny blood spots) raised by the rubbing. Gua Sha is one of several techniques that intentionally raises the Sha.

When used in breaking up scar tissue, it is somewhat painful. As you rub over the affected area, *you should not exceed a 5 out of 10 on a pain scale where 0 is no pain and 10 is unbearable pain.*

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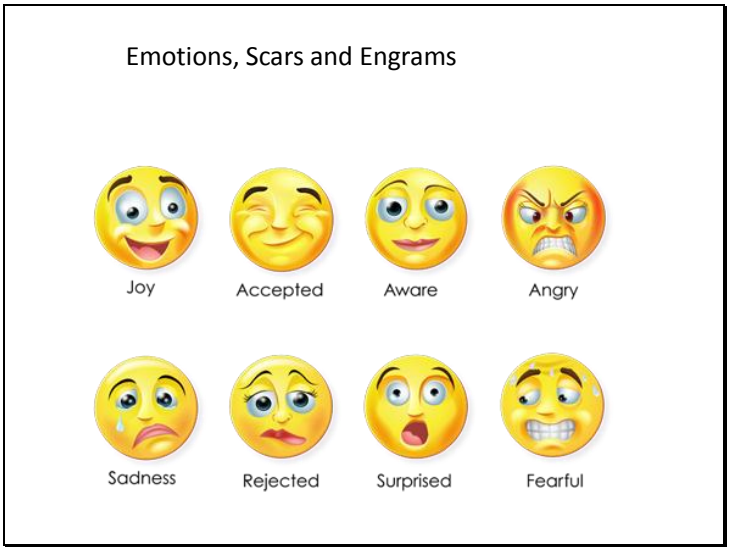
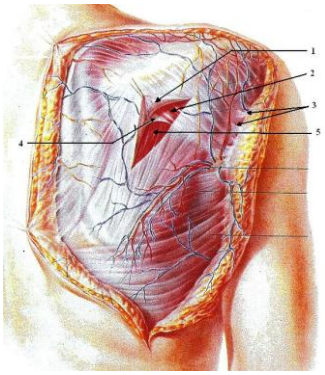

Emotions, Scars and Engrams
Joy
Accepted
Aware
Angry
Sadness
Rejected
Surprised
Fearful

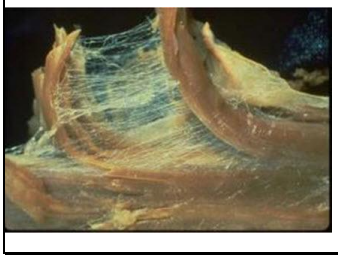
Slide 42

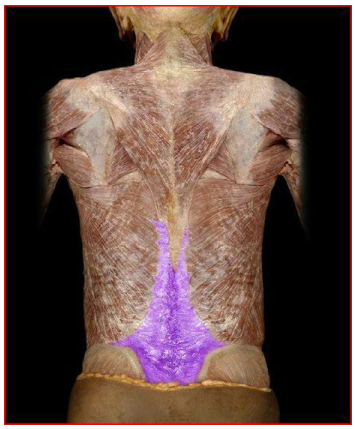
Fascia



Slide 43

Cadaver





Slide 44

Twenty cadavers from the Department of Anatomy, University of Melbourne were dissected (40 limbs). The fascia of the posterior thigh (**Hamstrings**) is morphologically dissimilar to that seen elsewhere in the proximal lower limb. The homogenous, smooth texture of fascia seen elsewhere is replaced with a more friable structure, which is firmly tethered to the skin, especially at the buttock crease

Figure 1 the Fascia of the lower limb (embalmed cadaver) demonstrating the heterogeneity of fascial structure, lateral thigh (ITB) Vs posterior thigh (PT). Fascial 'fronds' are demonstrated.

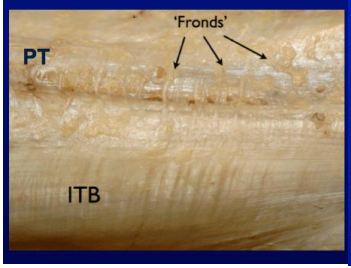
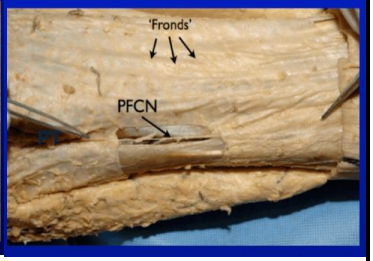


Figure 1 the Fascia of the lower limb (embalmed cadaver) demonstrating the posterior femoral cutaneous nerve (PFCN) beneath the fascia of the posterior thigh (PT)



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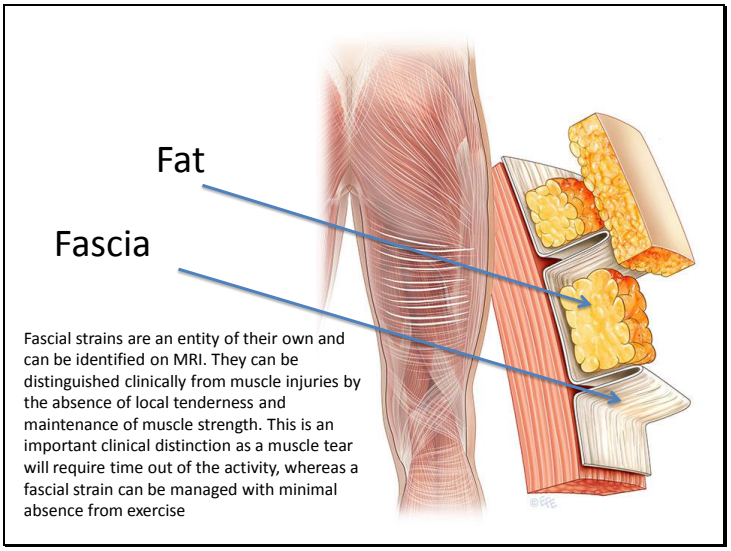
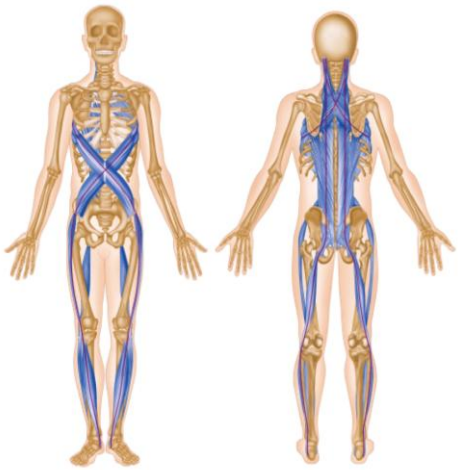

Fat
Fascia
Fascial strains are an entity of their own and can be identified on MRI. They can be distinguished clinically from muscle injuries by the absence of local tenderness and maintenance of muscle strength. This is an important clinical distinction as a muscle tear will require time out of the activity, whereas a fascial strain can be managed with minimal absence from exercise

Slide 46

It has been shown that the fascia that surrounds the muscles of the lower limb is continuous with the thoracolumbar fascia proximally (rand the paratenon of the achilles tendon distally **(Franklyn-Miler et al, BJSM 2009).**



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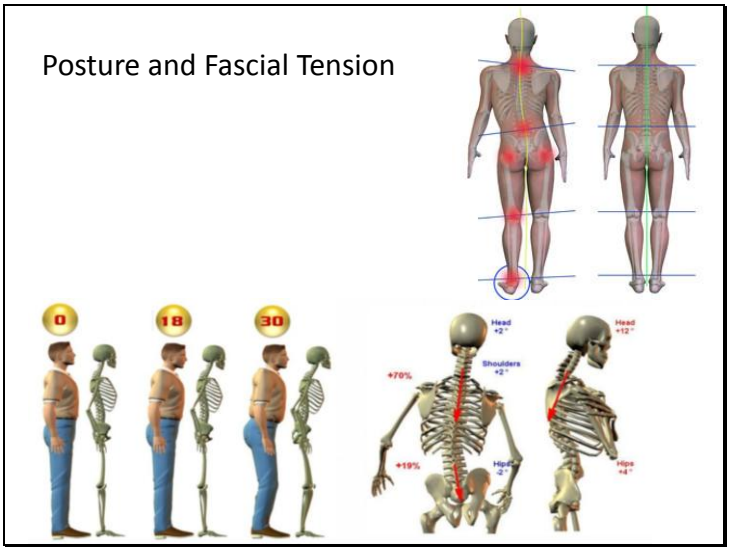
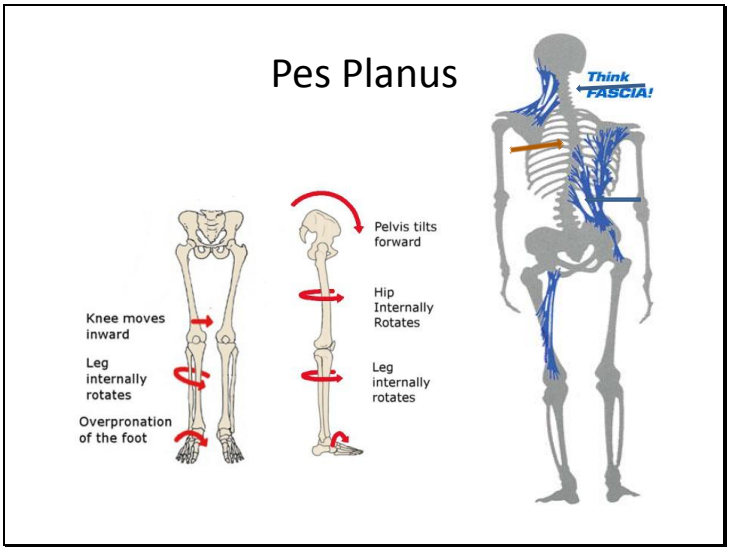
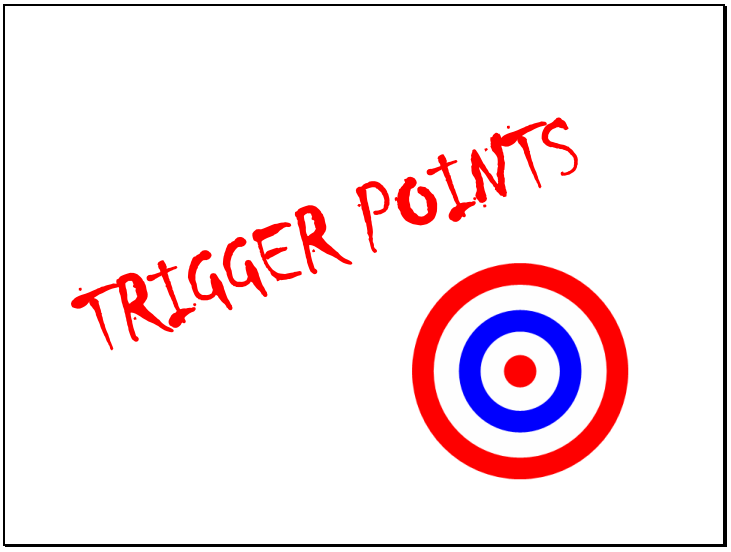

Posture and Fascial Tension
0
18
30
Head
+2°
Shoulders
+2°
+70%
+19%
Head
+12°
Hips
+4°

Slide 48


Pes Planus
Think FASCIA!
Knee moves inward
Leg internally rotates
Overpronation of the foot
Pelvis tilts forward
Hip Internally Rotates
Leg internally rotates

Slide 49



Slide 50

One Trigger Point is called a Pain in the A–

Collection of many nasty trigger points is called **Myofascial Pain Syndrome (MPS).**

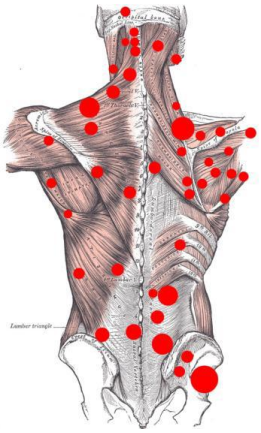
Slide 51

CENTRAL TPs An sensitive isolated area in skeletal muscle belly that is associated with a hypersensitive nodule that is palpable and in a taught band.

ATTATCHMENT TPs
A TP located at a junction of muscle belly/tendon o tendon/bone. These usually attribute to the tensior that is felt (feels like tight band) in the muscles. Usually these will also be associated with central TPs as well.

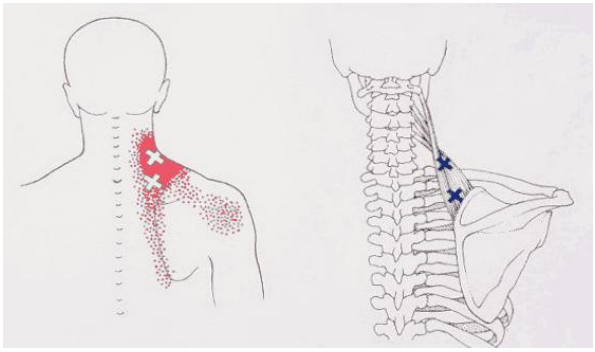
Satellite TPs
is one which is activated by a key trigger point. Successfully treating the key trigger point will often resolve the satellite, either converting it from being active to latent or completely treating it.

Key trigger point is one that has a pain referral pattern along a nerve pathway that activates a latent trigger point on the pathway, or creates it.



Slide 52

Levator (mouse muscle)



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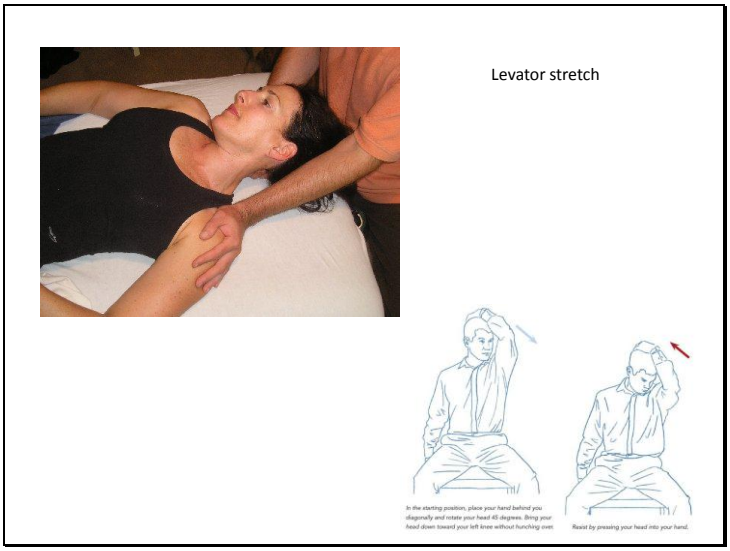
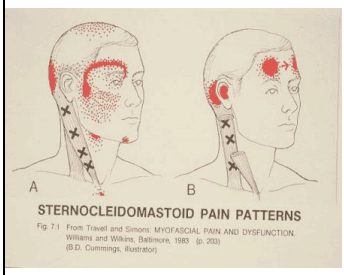

Levator stretch
In the starting position, place your hand behind you diagonally and rotate your head 45 degrees. Bring your head down toward your left knee without hunching over.
Resist by pressing your head into your hand.

Slide 54

SCM



STERNOCLEIDOMASTOID PAIN PATTERNS

Fig. 7.1 From Travell and Simons: MYOFASCIAL PAIN AND DYSFUNCTION. Williams and Wilkins, Baltimore, 1983 (p. 203) (B.D. Cummings, Illustrator)

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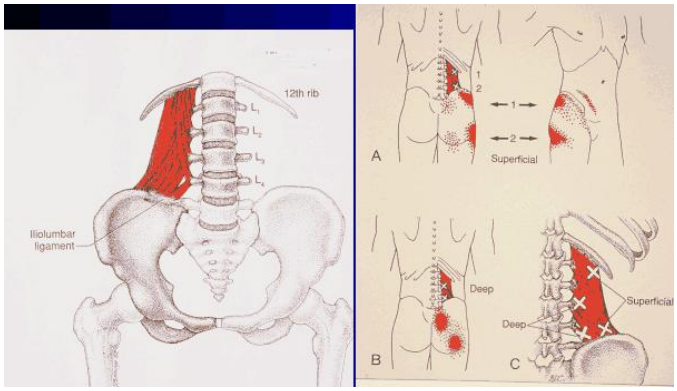
Quadratus Lumborum



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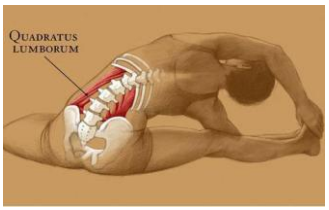
QL stretches



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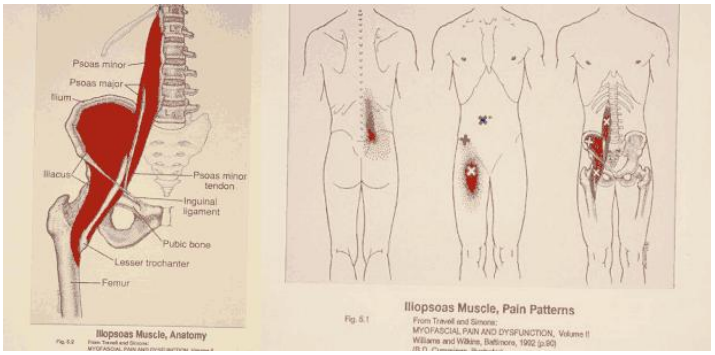
Psoas



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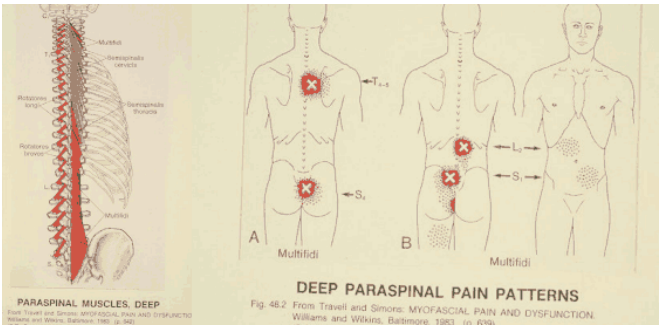
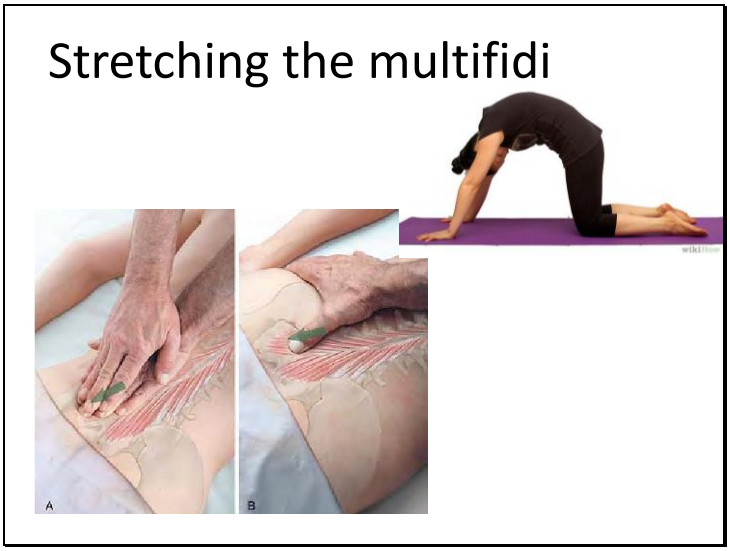
Multifidus



Slide 59



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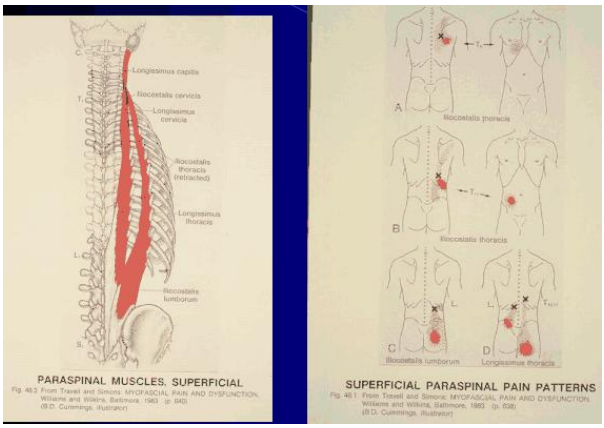
Longissimus/ Iliocostalis



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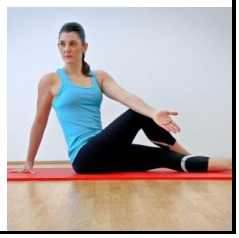
Stretching the Longissimus/Iliocostalis



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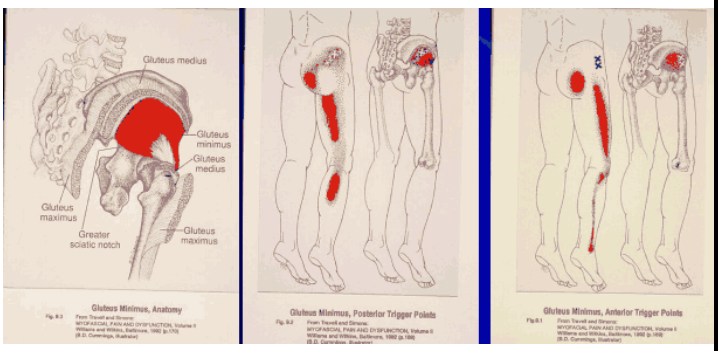
Glute Min



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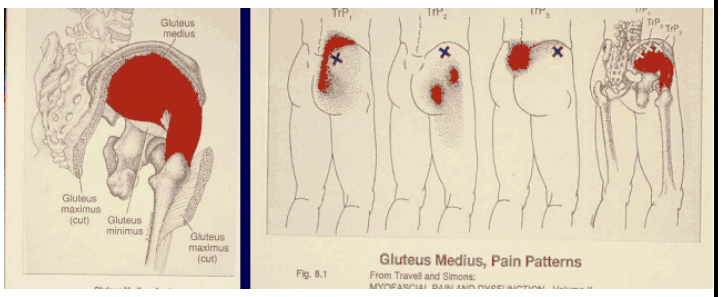
Glute Medius



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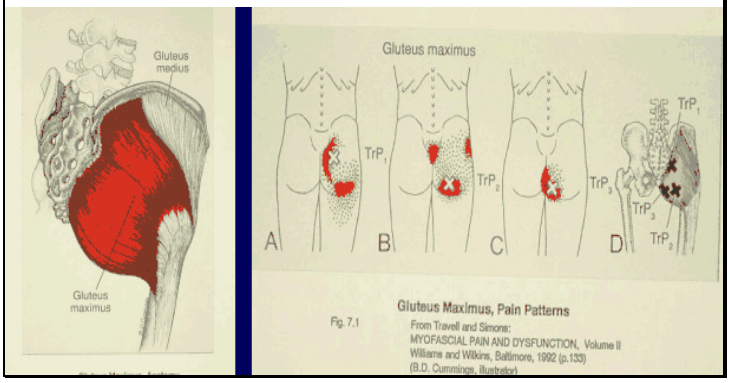
MAXIMUS! “el buttikus”



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Stretches for the Glutes

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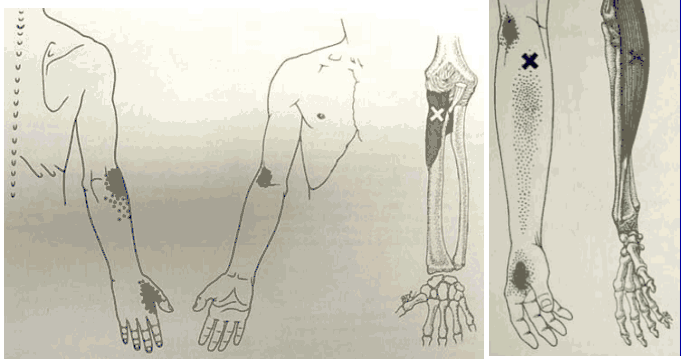
Supinator/Brachioradialis



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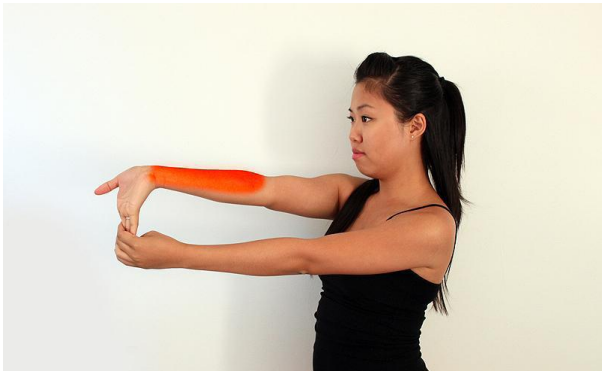
Supinator/Brachio Stretch



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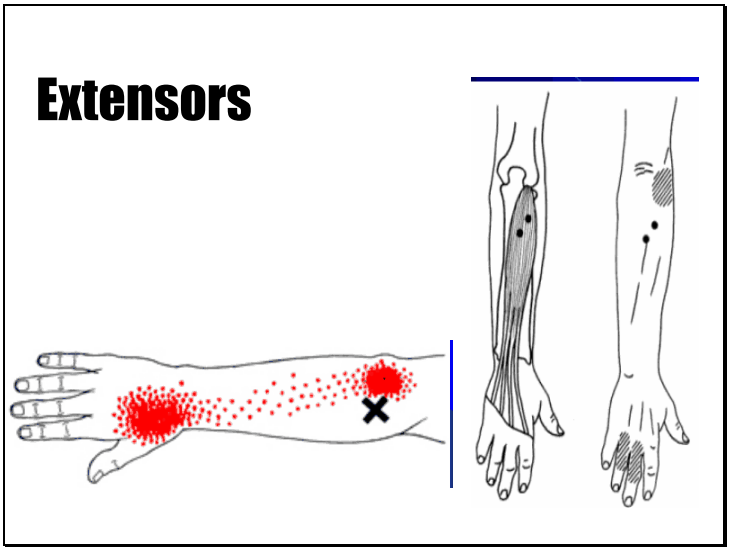

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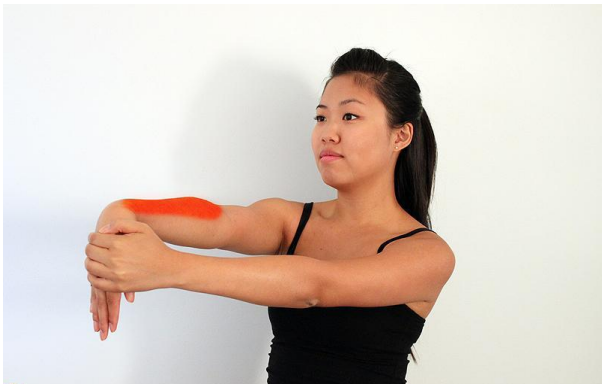
Extensor Stretch



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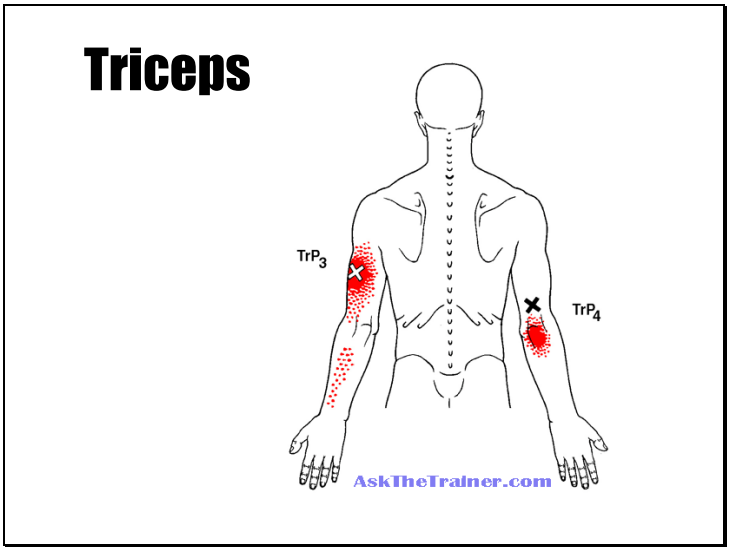

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Triceps Stretch

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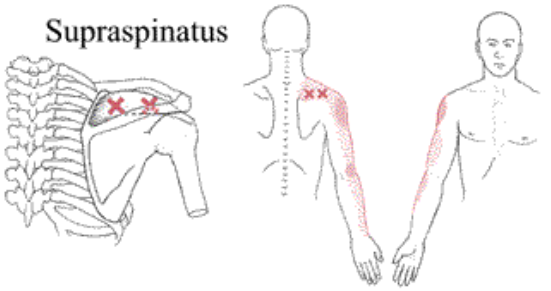
Supraspinatus



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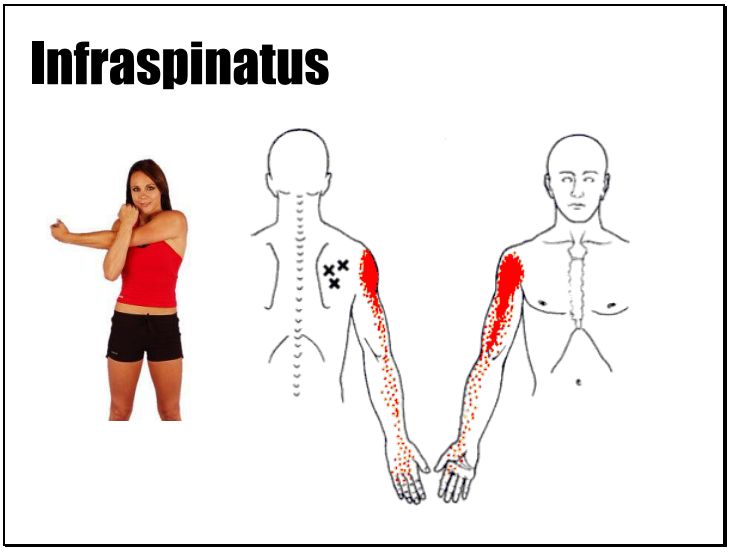
Supraspinatus stretch

Slide 74



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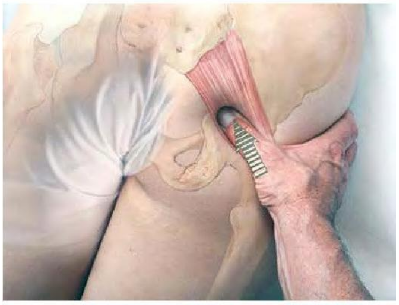
Piriformis Entrapment



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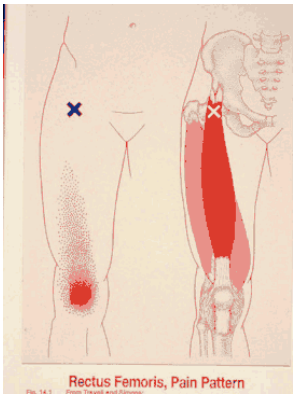
Rectus Femoris



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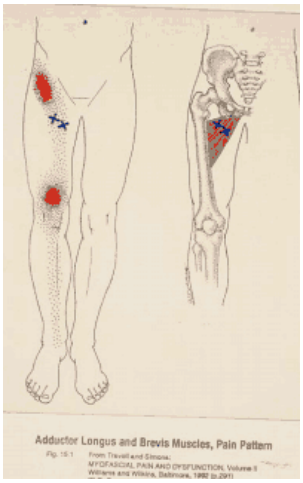
Adductors



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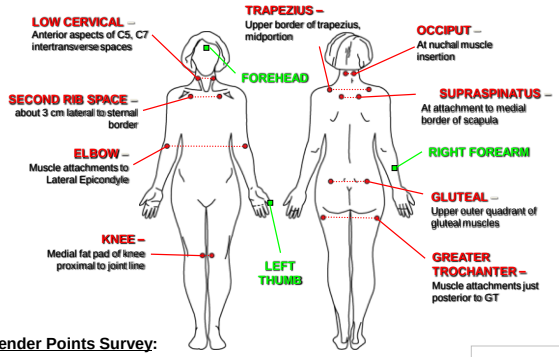
Fascia and Fibromyalgia

Slide 79

ACR-Recommended Manual Tender Point Survey* for the Diagnosis of FM



Manual Tender Points Survey:

- Presence of 11 tender points on palpation to a maximum of 4 kg of pressure (just enough to blanch examiners thumbnail)

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How much is 4kg???????

- Palpation force is 4 kg or equal to the force needed to just blanch your thumbnail

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Housekeeping

- Questions
- Notes
- Recordings
- Certificates/Tests
- info@drbryanhawley.com
- Lets begin