

Introduction to OMM for MDs and DOs

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- NCOPPE & KCOM

Myofascial Release

Introduction and Axial Spine Techniques

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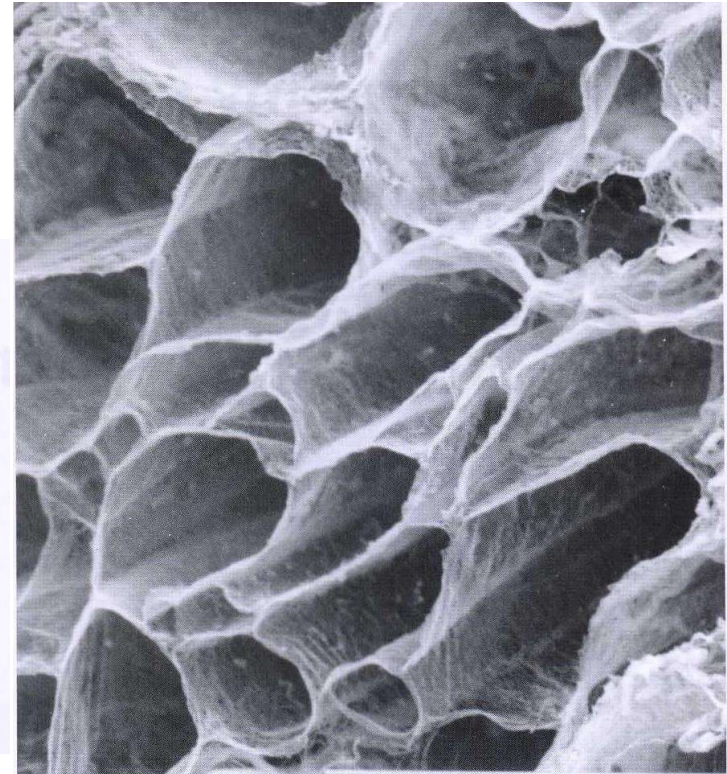
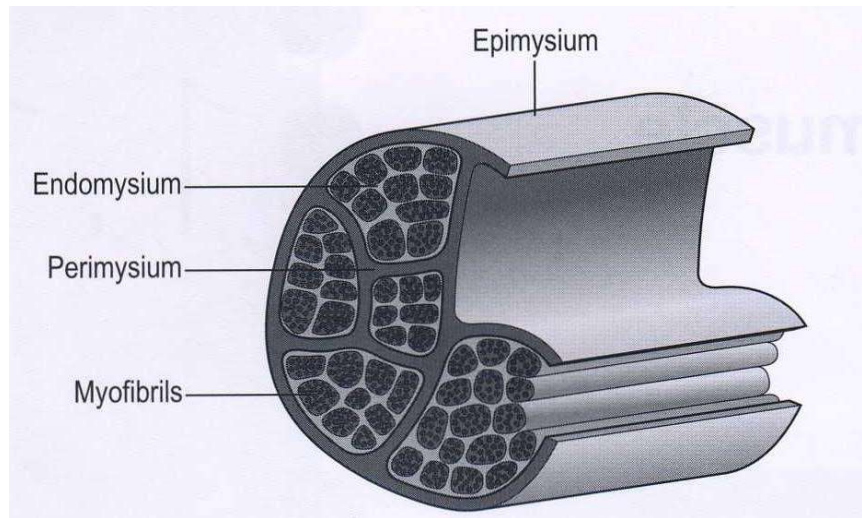
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Objectives

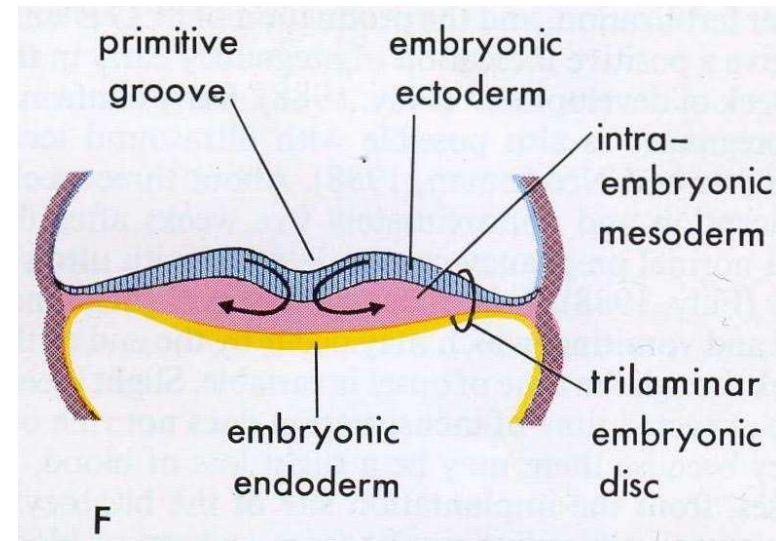
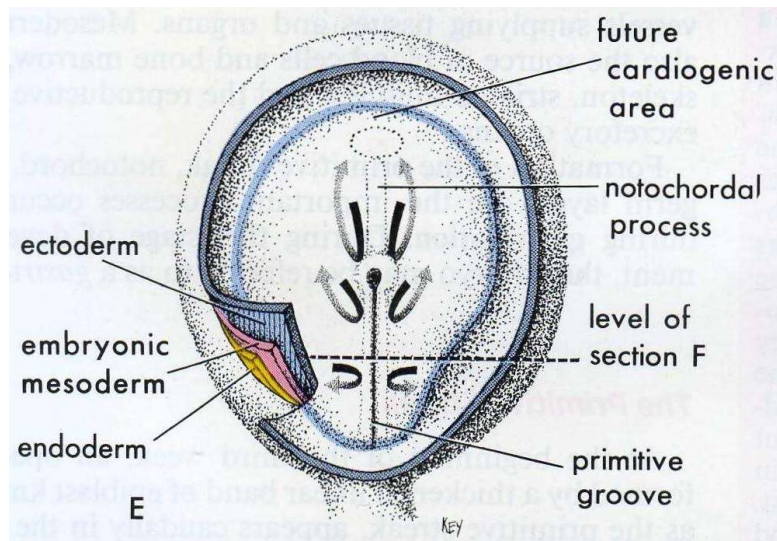
- Summarize the basic concepts of myofascial release (MFR) and integrated neuromuscular release (INR) as treatment methods
- Demonstrate how to treat somatic dysfunction using MFR and INR
- Demonstrate how to treat somatic dysfunction of the axial spine and thorax using MFR and INR, using both indirect or direct method.
- Describe when to use these treatment methods by providing Clinical Scenarios as examples of patients who might benefit from this approach.

Fascia



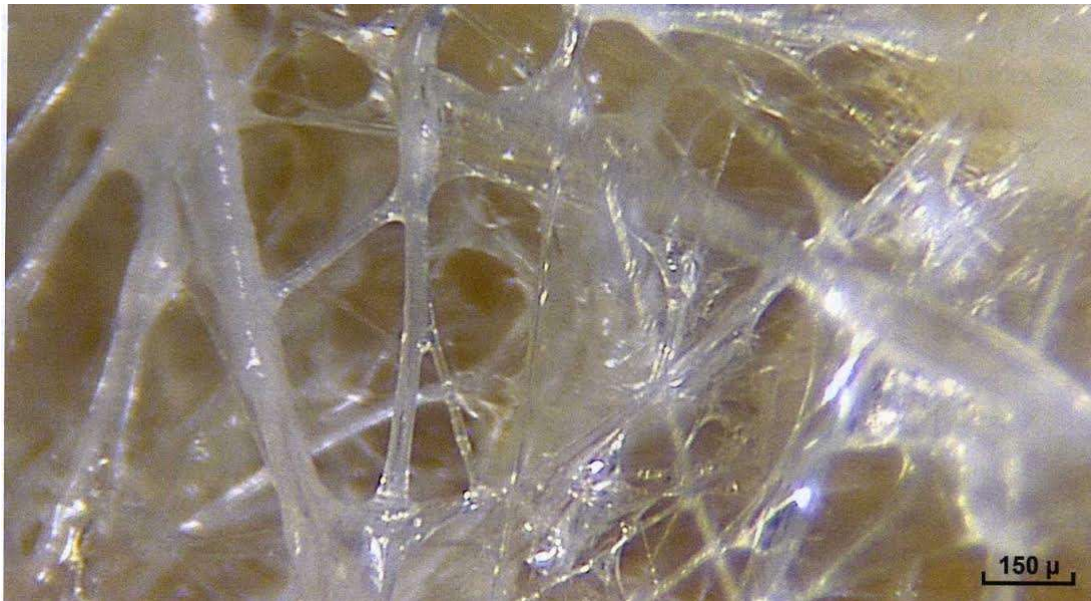
- All of the soft fibrous connective tissues that permeate the human body.
- Fascia surrounds and invests most of the body's structures.

Fascia formed in mesoderm creates a body-wide communication system via transmission of mechanical forces



- 21 day embryo

Fascia creates one interconnected tensional network that adapts its fiber arrangements and density according to local tension demands.

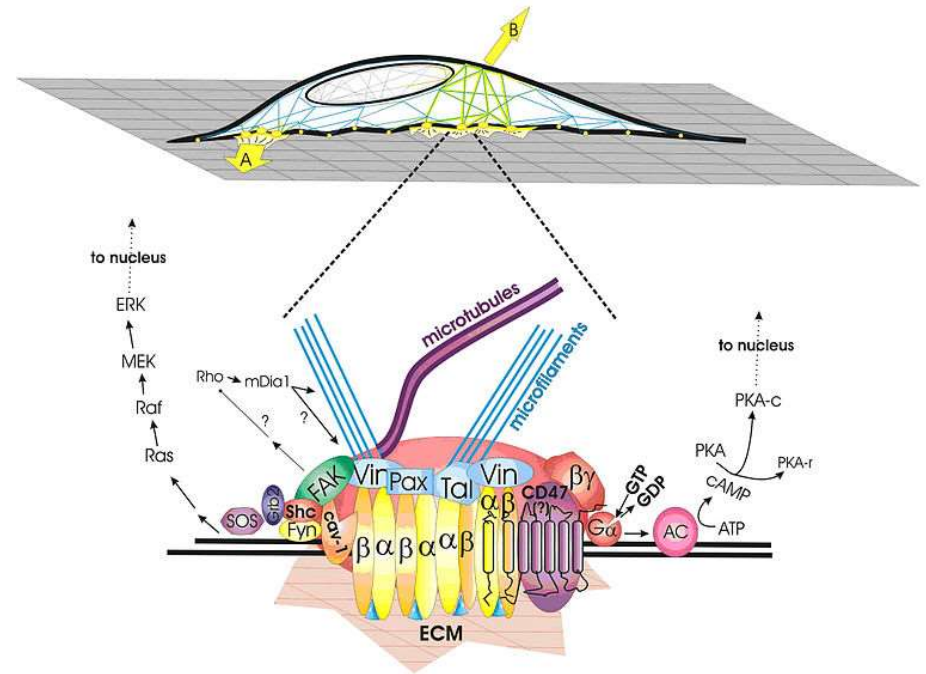


Mechanotransduction

- Fascia surrounds and invests most of the body's structures.
- Cells are affected by, and respond to, their environment
 - Both biochemical and biomechanical
- The extracellular matrix is connected to the cellular adhesion molecules, microtubules and microfilaments, and the nucleus. (mechanotransduction affects genetic regulation).
- Embryologic plasticity: Eg. Traumatized tendon with islands of cartilage - Genetic regulation affects fluid and nutritional exchange, cell health and programmed cell death.
- Osteopathic approaches can potentially influence nearly all anatomical structures: fascia, arteries, veins, nerves, viscera, bones, vertebral discs.

Mechanotransduction Process

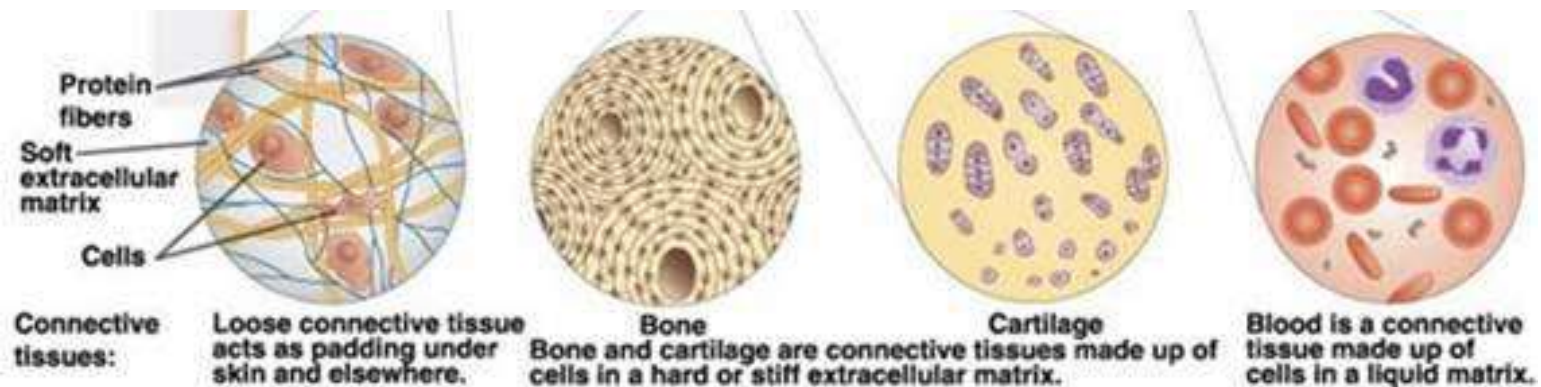
- A local force applied to integrins (arrows labeled A and B in top figure) through the extracellular matrix (ECM)
- Activates signal transduction at focal adhesion complex (shown as cluster of molecules in bottom figure).
- This clustering triggers a cascade of reactions that alter the balance of anabolic / catabolic events within the cell.



<http://web1.tch.harvard.edu/research/ingber/>

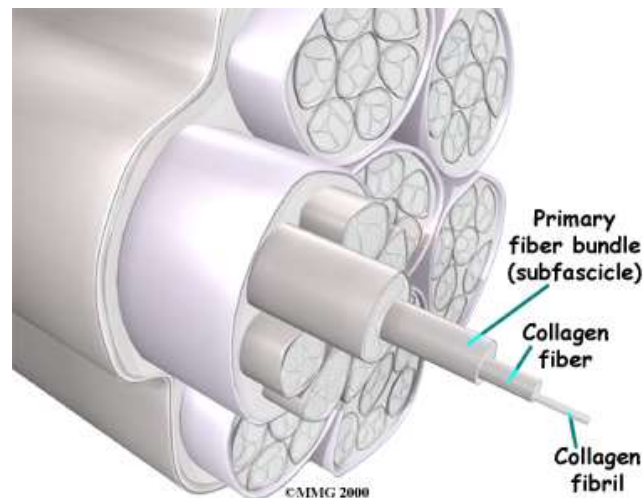
Connective Tissue Properties

- Connective tissue and muscle comprise 80% of the tissues of the body
- Connective tissues are viscoelastic material with properties of both viscous (fluid) materials and elastic materials
- When connective tissue is placed under a load the fibers will stretch until they reach the anatomic barrier



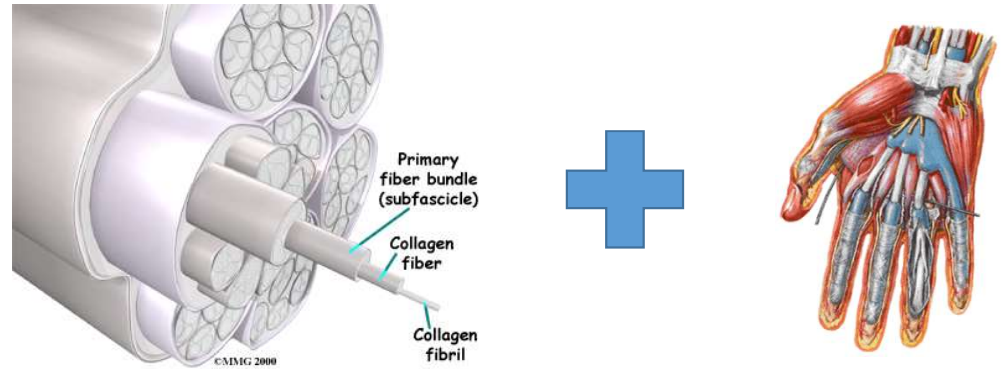
Connective Tissue Structure and Function

- Connective tissue includes collagen, fibrin, and reticulin that act as the body's reactor to motion and stress.
- Coupled with skeletal muscle, these produce particular properties of muscle function
- Force effects of connective tissue result from its structure, and determine how tissue responds to force in daily life, injury, or with OMT



Wolff law of bone transformation: Function dictates Structure (internal architecture and external conformation)

Physical Properties of Connective Tissues Coupled with Skeletal Muscle

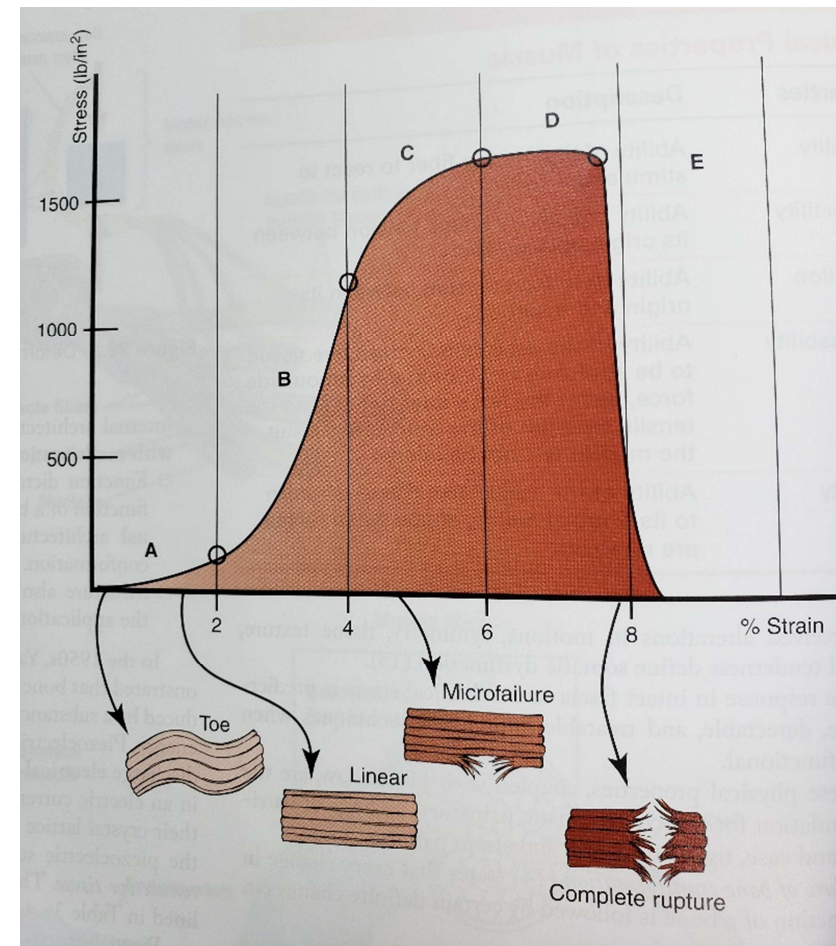


Irritability	Ability of the muscle fiber to react to stimulation
Contractility	Ability to actively create tension between the origin and insertion
Relaxation	The ability of the tissue to release or reduce tension between its origin and insertion
Distensability	Ability of tissue to be stretched and deformed without injury*
Elasticity	Ability of the connective tissue to return to its original resting shape when forces are removed

*force must not exceed tensile strength of the tissue

Force Effects in Connective Tissue

Plastic deformation	A stressed, formed, or molded tissue <i>preserves</i> its new shape
Elastic deformation	A stressed, formed, or molded tissue <i>recovers</i> its original shape
Viscosity	Ability of a solid to continually yield under stress with measurable rate of deformation
Creep	Continued deformation of a viscoelastic material under constant load over time
Stress	Effect of a force normalized over an area
Strain	A change in shape as a result of stress
Hysteresis	Response to loading and unloading of connective tissues: Restoration of final length of tissue occurs at a rate (to an extent less) than during deformation. Represents energy loss in connective tissue.



Hysteresis and Hooke's Law: Stress is proportional to Strain

Myofascial Release (MFR)

- First described by AT Still
- A system of Dx & Tx which engages continual palpatory feedback to achieve release of myofascial tissues.
- Indications
 - MFR is used to treat somatic dysfunctions involving myofascial tissues or other connective tissues.



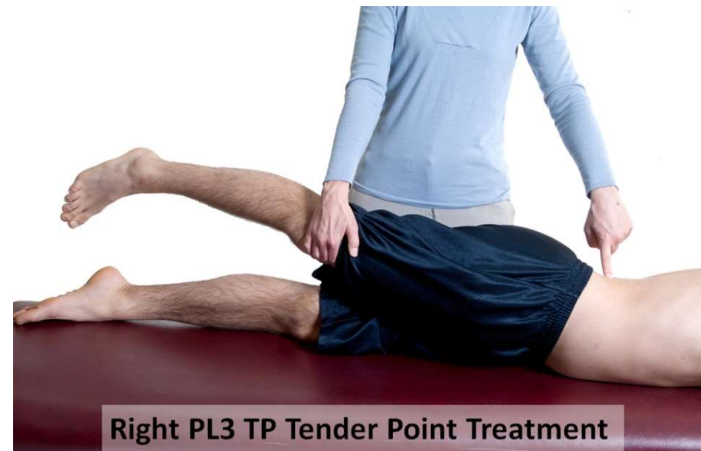
Francis Feidler DO. Household Osteopath. 1906

“MFR Techniques harness the power of collagen through diagnosing and treating in the fascia, the largest collagen pool in the body”

—Judith A. O’Connell, D.O.

Myofascial Release Techniques

- Any technique that targets myofascial structures
 - Counterstrain
 - Facilitated positional release
 - Functional technique
 - Balanced ligamentous technique
 - Progressive inhibition of neuromuscular structures
 - Ligamentous articular strain
 - Percussion hammer
 - **Myofascial release**



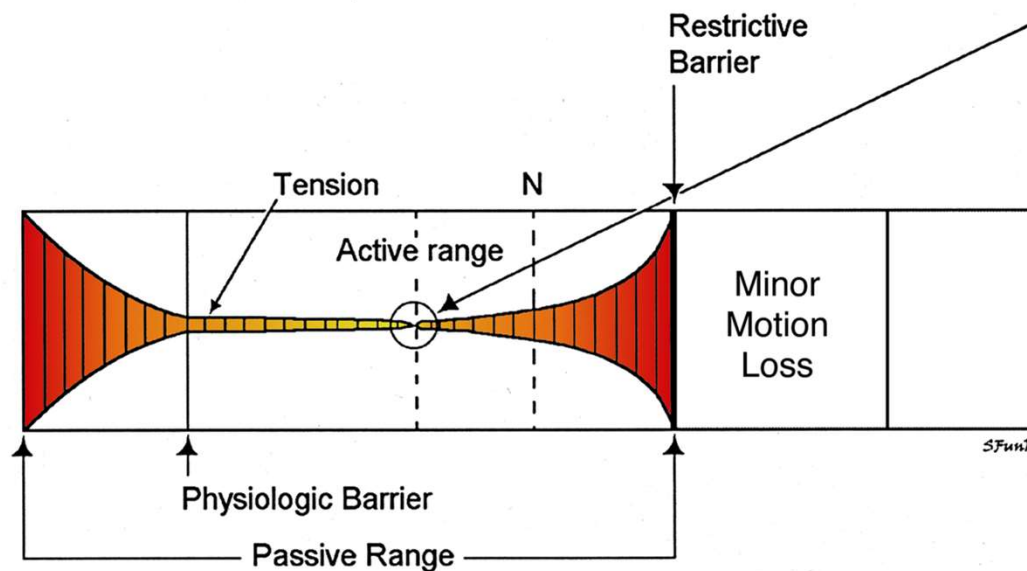
MFR Contraindications

Cautions and relative contraindications for local application in patients with:

- Fractures
- Open wounds
- Soft tissue or bony infections
- DVT (risk of embolism)
- Anticoagulation
- Disseminated or focal neoplasm
- Recent surgical wound (risk of dehiscence)
- Aortic aneurysm

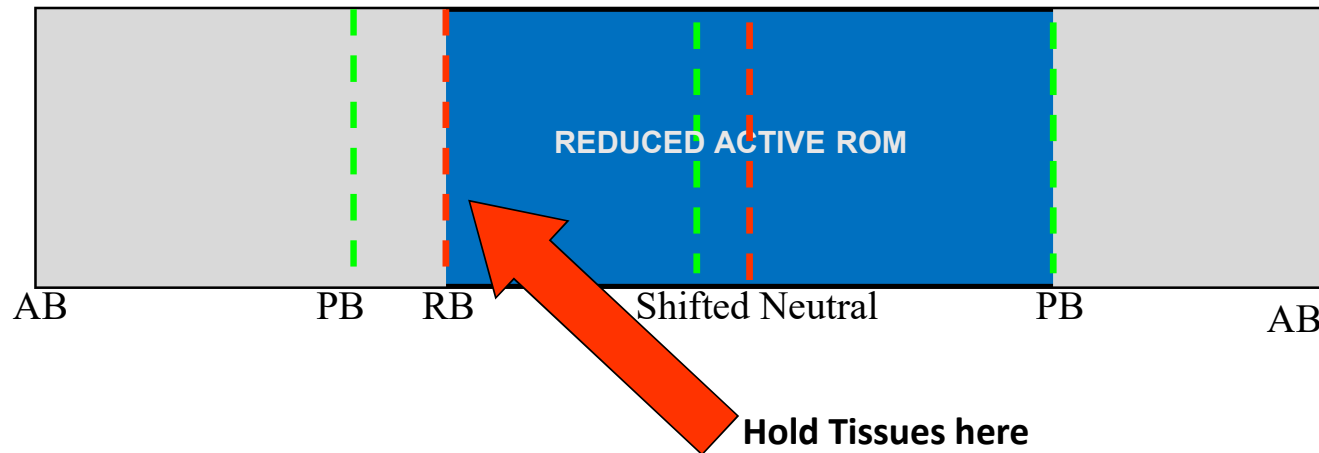
Diagnosis Preceding MFR

- Passive motion testing for a region, local tissues, or a joint is performed to identify a restrictive barrier and a position of ease.



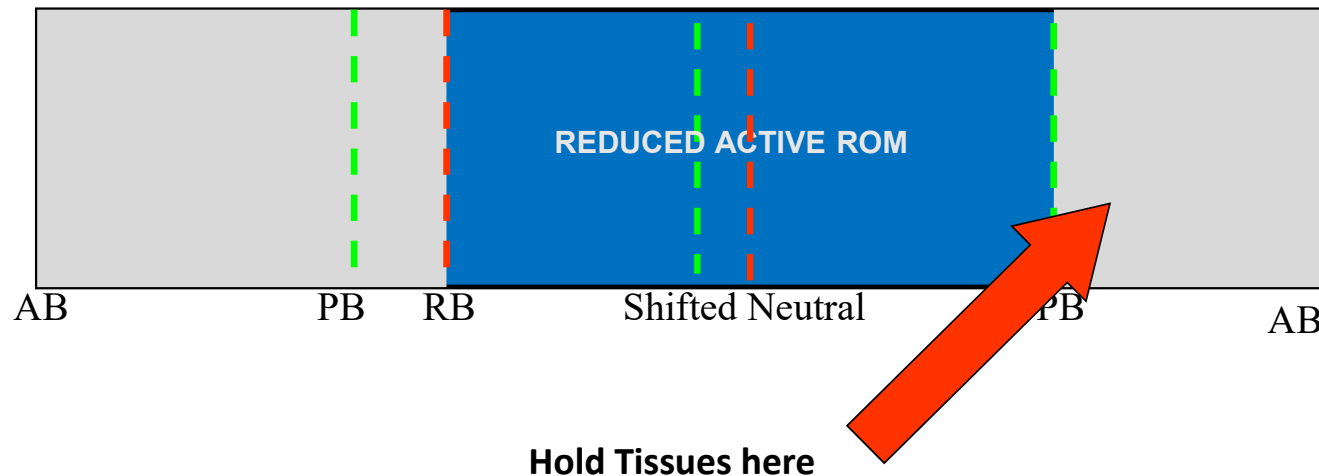
Direct MFR

- The dysfunctional myofascial tissues are loaded and restrictive barrier is engaged with a constant, directional force.
- Movement of a patient by the physician into the restriction for all planes, applying steady force until tissue release or fascial unwinding is completed.
- **After determining the direction of myofascial tension, hold the tissues firmly against soft tissue resistance.**



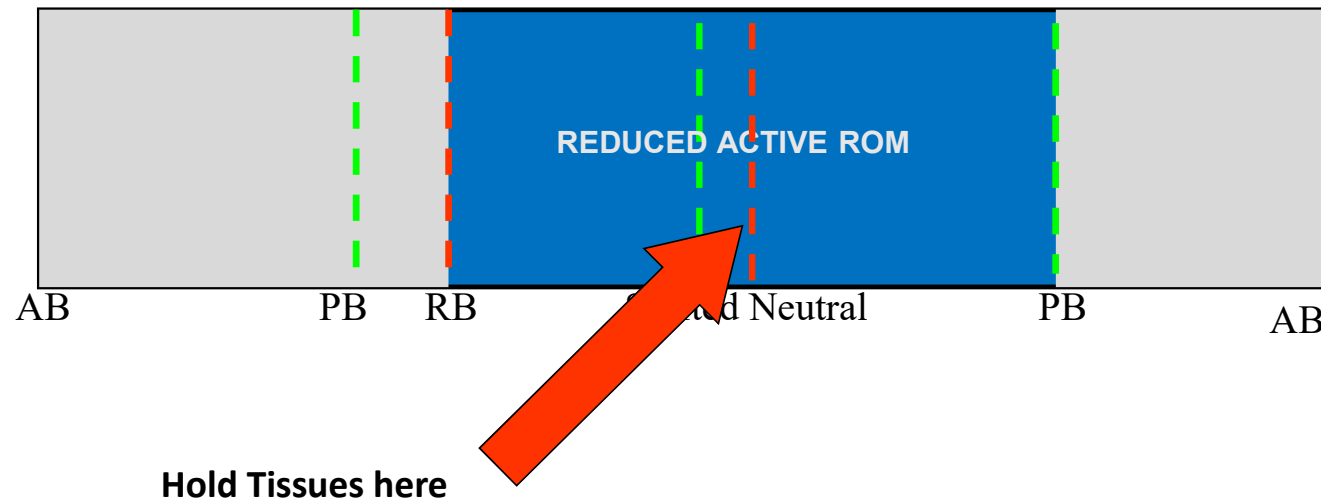
Indirect MFR

- The dysfunctional myofascial tissues are loaded and then guided towards the position of greatest ease, and engaged with directed pressure.
- Movement of a patient by the physician into the position of ease for all planes until desired tissue release or fascial unwinding has occurred.
- **After determining the direction of myofascial tension, exaggerate the position of ease.**



Balance Ligamentous Tension

Position tissues at shifted neutral position



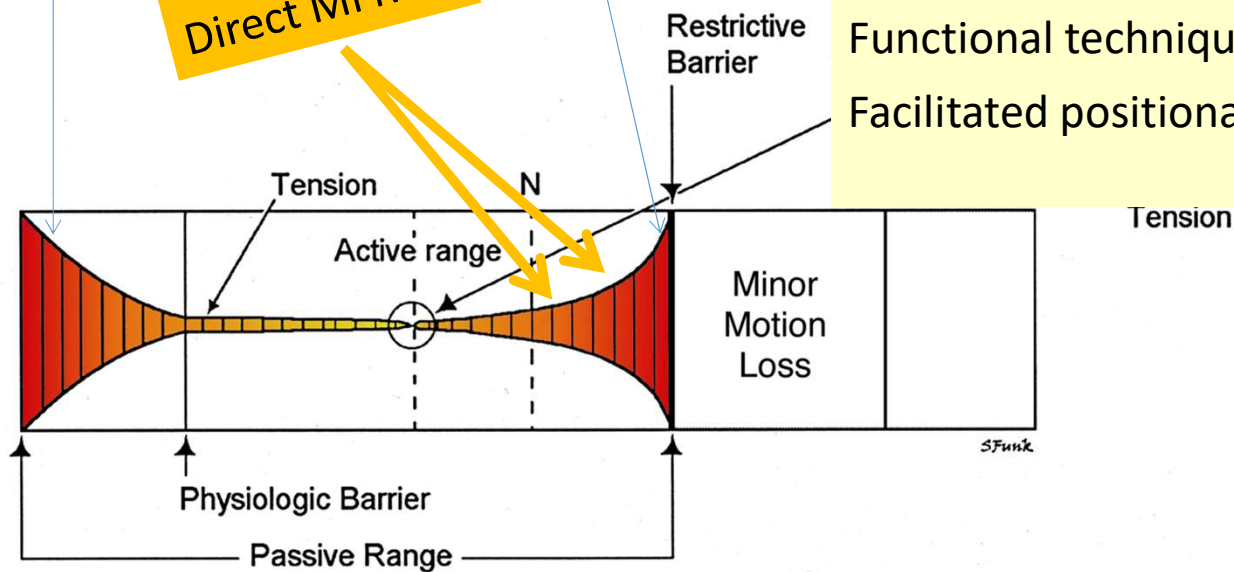
Exaggeration techniques

Indirect MFR

HVLA
Articulatory

MET
Direct MFR

- Balanced ligamentous tension
- Functional technique
- Facilitated positional release



Direct MFR: After determining the direction of myofascial tension, hold the tissues firmly against soft tissue resistance.

MFR: Release Enhancing Maneuvers

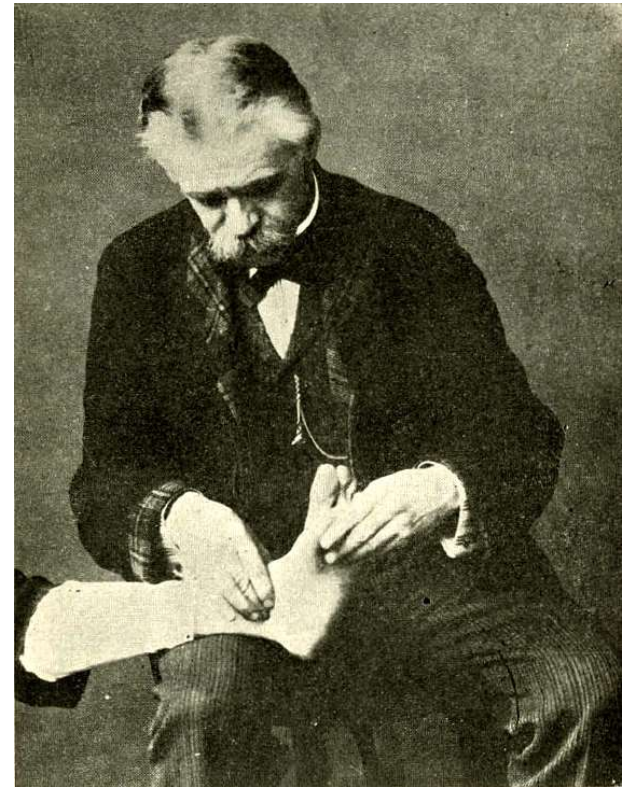
- May increase or decrease tension of the myofascial structures
- Goal is to increase and/or speed up the response of the myofascial structures while performing the technique
- Sometimes referred to as Integrated Neuromusculoskeletal Release (INR) to emphasize the reflexive influence between the biomechanics of the musculoskeletal system with the peripheral and central neural control mechanisms

MFR Release Enhancing Maneuvers

- Patient instructed to perform motor actions
 - Eye, tongue, jaw, head/neck, or limb movements
- Regional compression, distraction, torsion, or oscillation
- Respiratory cooperation - Hold in phase which encourages either increased or decreased tissue tension
- Deep respiration – Full respiratory cycle
- Breath holding to point of air hunger – triggers general relaxation of soft tissues
- Coughing or sniffing on command – respiratory impulse for release of restrictions

Myofascial Release

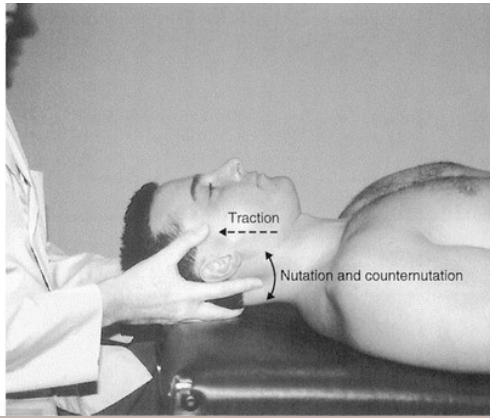
1. Position tissues as appropriate barrier(s)
2. Maintain firm, but gentle pressure. The tissues will then begin to creep due to viscoelastic properties.
3. Follow the tissues as they move to maintain pressure at the direct or indirect motion barrier.
4. May take 15-120 seconds of stretch
5. Continually reassess the treatment position until release is felt or balanced motion is obtained
6. Release may occur as a sudden give/relaxation in the tissue tension or the motion (creep) stops
7. Reassess to determine efficacy
8. Repeat as needed to affect different tissue layers



Summary

- Indirect myofascial release starts at physiological barrier opposite the direct barrier – indirect barrier
- Balanced ligamentous tension starts at shifted neutral position
- Direct myofascial release starts at direct pathophysiological barrier – direct barrier
- Constantly reassess and hold tissue at barrier to allow fascial unwinding (creep) to occur
- Integrated neuromuscular release uses voluntary patient motion to facilitate the fascial unwinding
- Recheck when motion stops
- Questions?

MFR Technique Intro – Lab Session



Craniocervical Junction Myofascial Release Diagnostic Exercise

- Basiocciput hand position allows focus at OA, AA, C2
- Notice both facet joint tension and muscular tension
- Overlapping hand position allows focused twist, traction, sidebending and translation
- Check for ***Preference*** of Motion:
 - Rotation
 - Sidebending / Translation
 - Nutation and Counternutation (Flexion and Extension)



Craniocervical Spine Myofascial Release

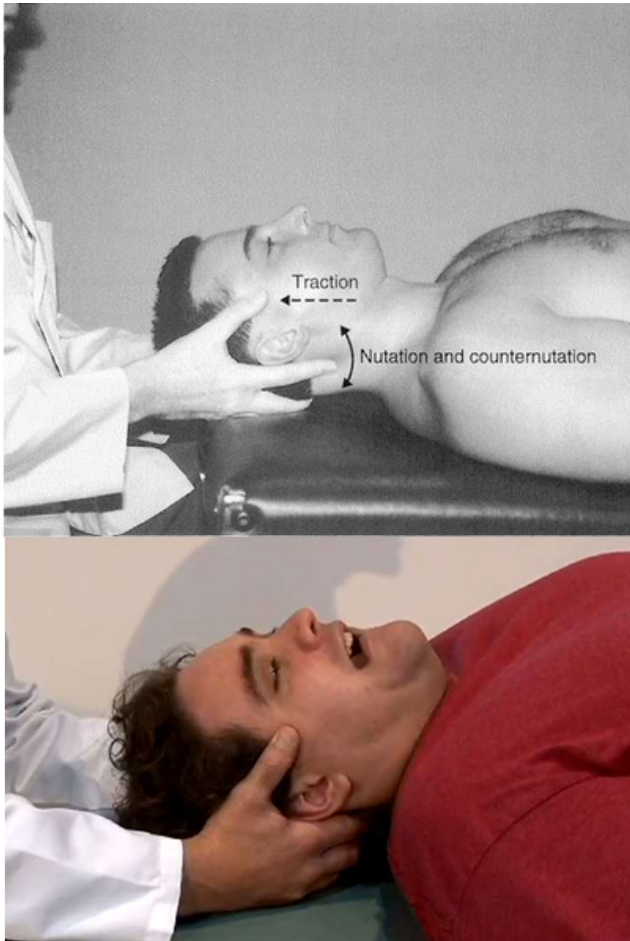
- Release Enhancing Maneuvers

- Patient instructed to perform motor actions

- Move upper extremities (C5-T1)
 - Deep respirations and sniffing (Phrenic N.-C3-5)
 - Coughing (CN-X, Phrenic, Spinal motor n.)
 - Eye movements (CN-III, IV, VI)
 - Jaw movements (CN-V)
 - Smile, frown, close eyes (CN-VII)
 - Move shoulders (trapezius) (CN-XI)
 - Tongue movements (CN-XII)

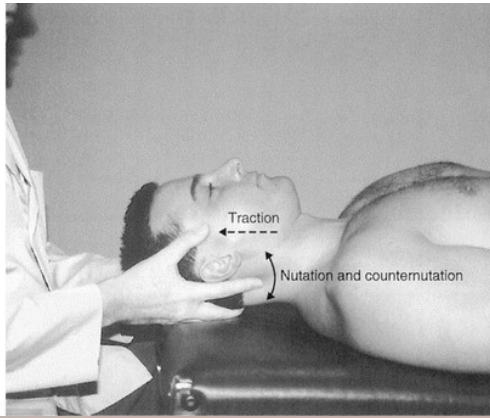
- 15-120 seconds, direct or indirect

- recheck



From: **Myofascial Release Figure 36.7**

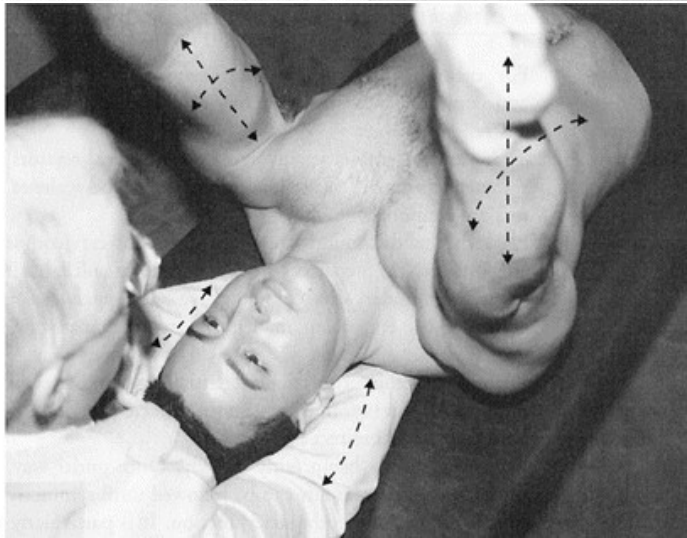
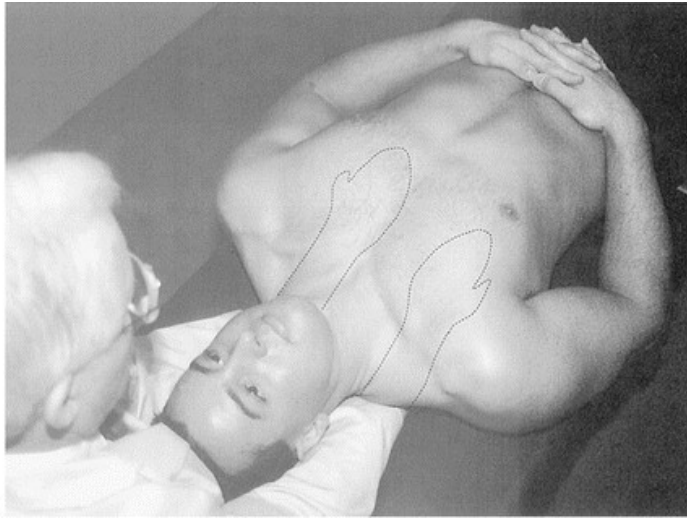
Foundations of Osteopathic Medicine: Philosophy, Science, Clinical Applications, and Research, 4e, 2018



Craniocervical Junction Myofascial Release RECHECK

- Basiocciput hand position allows focus at OA, AA, C2
- Notice both facet joint tension and muscular tension
- Overlapping hand position allows focused twist, traction, sidebending and translation
- Check for ***Preference*** of Motion:
 - Rotation
 - Sidebending / Translation
 - Nutation and Counternutation (Flexion and Extension)

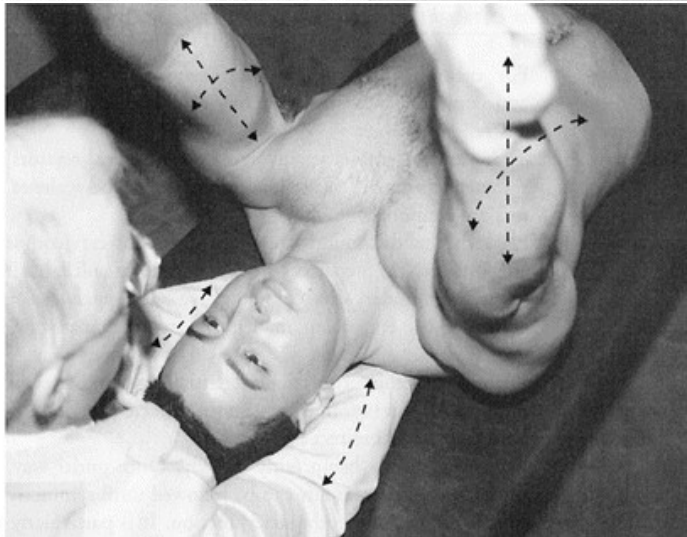
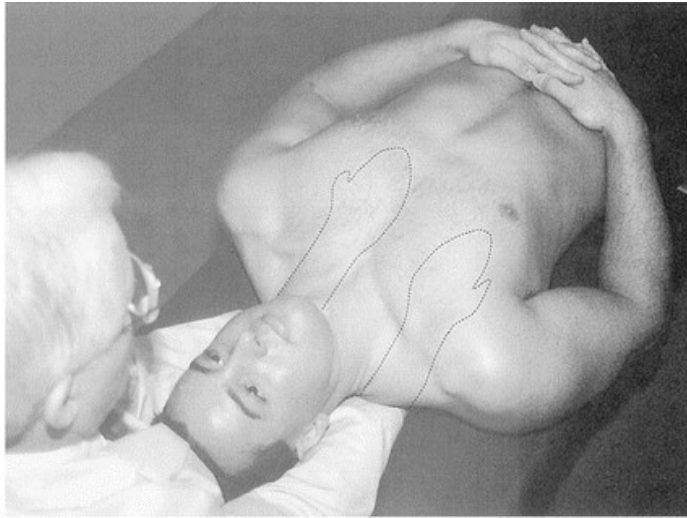




Myofascial Release: Thoracic and rib technique – Diagnostic Exercise

- Patient supine, physician seated at head.
- Arms beneath thoracic cage posteriorly with flat of hand and fingers contacting paraspinal surface.
- Whole hand contact from erector spinae to rib cage
- Diagnosis: Notice tension and asymmetries between the left and right hands.

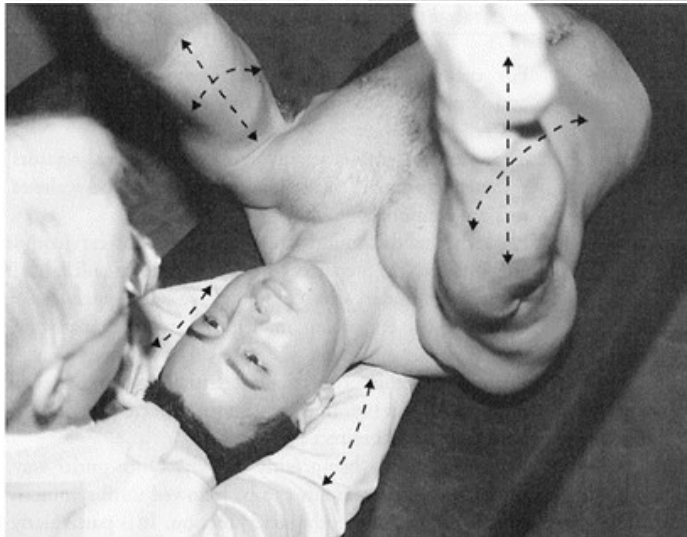
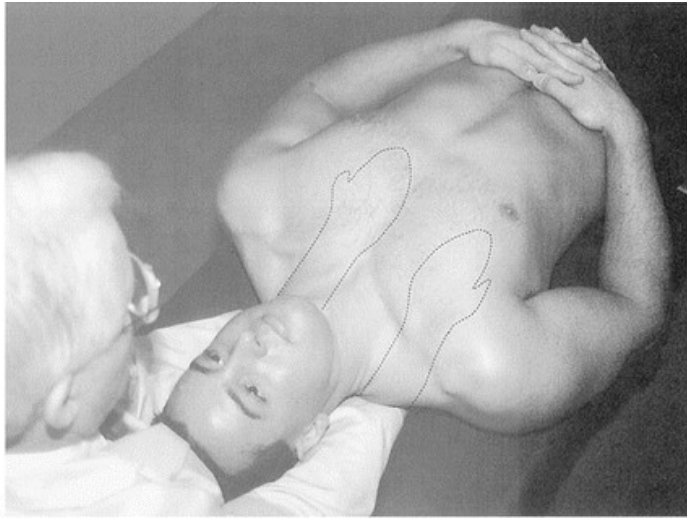
From: **Myofascial Release Figure 36.8**



Myofascial Release: Thoracic and rib technique – Diagnostic Exercise, Slide 2

- Patient supine, physician seated at head.
- Arms beneath thoracic cage posteriorly.
- Whole hand contact from erector spinae to rib cage.
- Diagnosis: Notice tension and asymmetries with:
 - Deep respiration
 - Upper limb movements
 - Lower limb movements

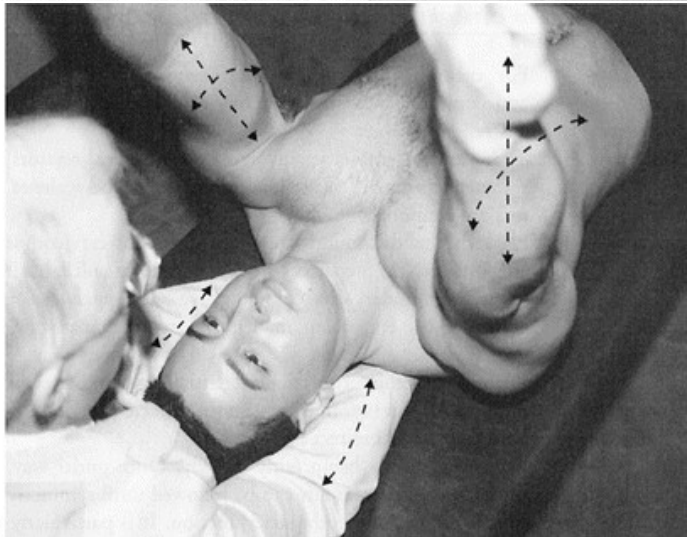
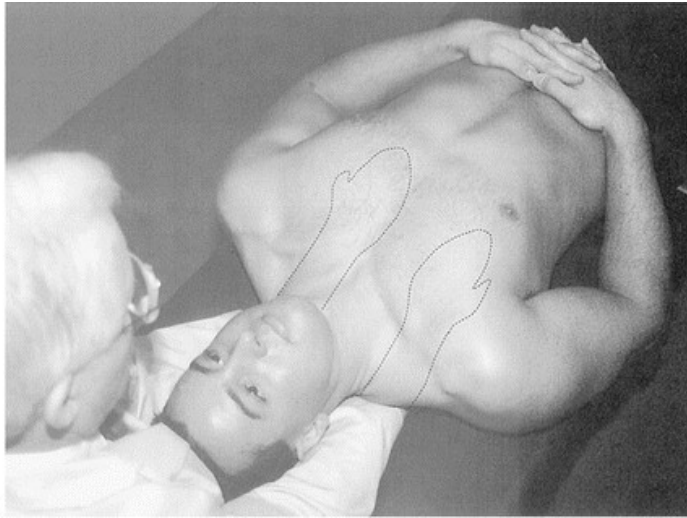
From: **Myofascial Release Figure 36.8**



Myofascial Release: Thoracic and rib technique

- Whole hand contact from erector spinae to rib cage
- Diagnosis: Notice tension and asymmetries with:
 - Deep respiration
 - Upper limb movements
 - Lower limb movements
- Treatment: Use the same for release enhancing maneuvers

From: **Myofascial Release Figure 36.8**



Myofascial Release: Thoracic and rib technique – Re-Check

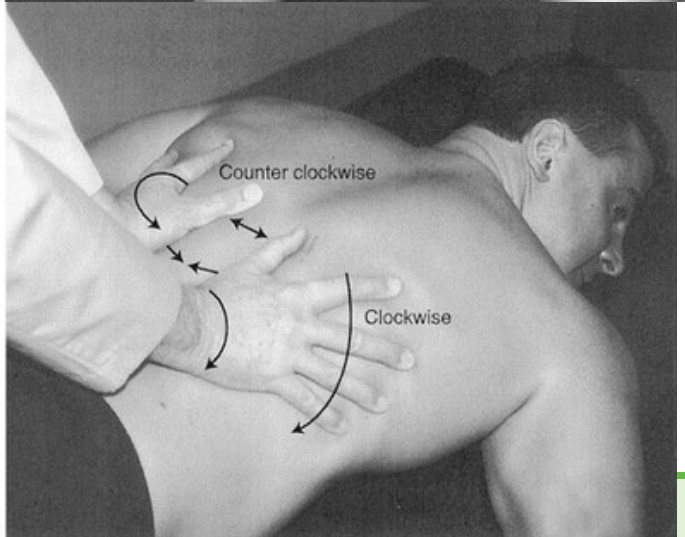
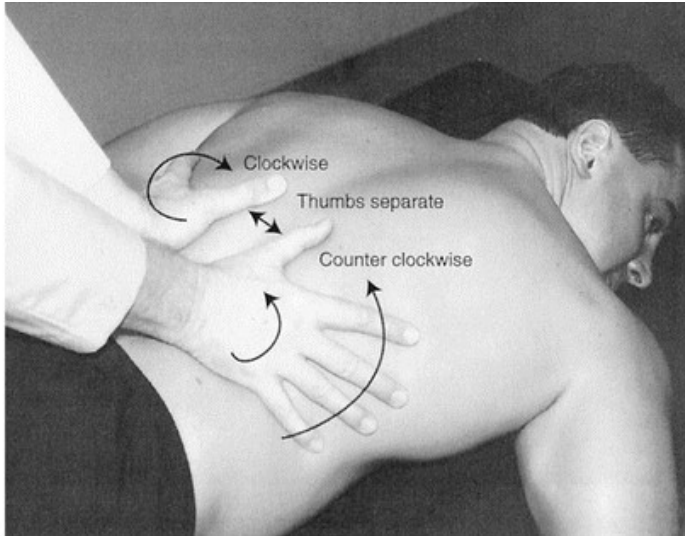
- Patient supine, physician seated at head.
- Arms beneath thoracic cage posteriorly.
- Whole hand contact from erector spinae to rib cage.
- Diagnosis: Notice tension and asymmetries with:
 - Deep respiration
 - Upper limb movements
 - Lower limb movements

From: **Myofascial Release Figure 36.8**

Myofascial Release: Thoraco-Lumbar, Diagnostic Exercise

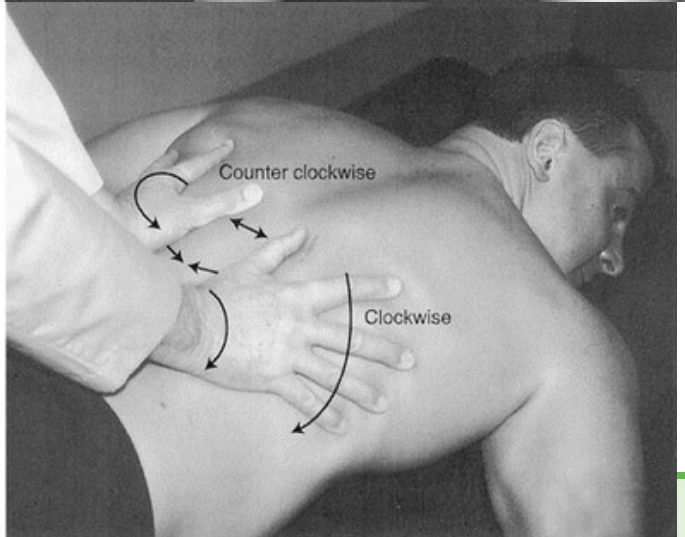
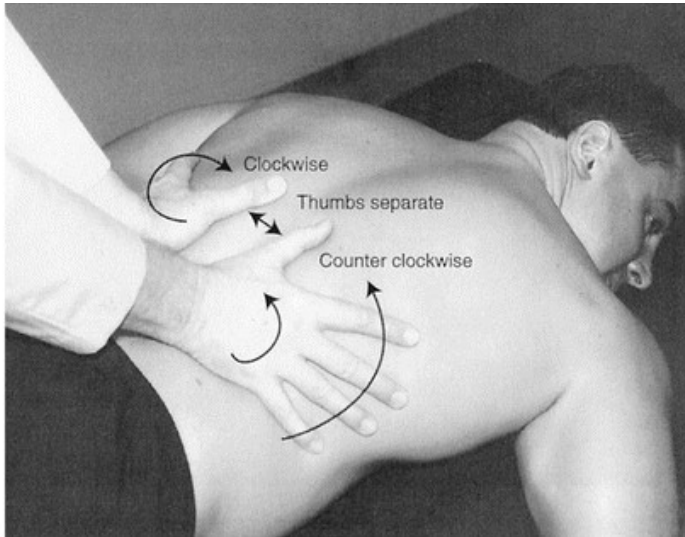
- Patient prone, physician stands at side of table.
- Place widely open hands over thoracolumbar junction, with flat of hands and fingertips over body surface.
- Identify superficial and deep tightness and looseness patterns
- Identify asymmetry of tension between left and right hands

From: **Myofascial Release Figure 36.9**



Myofascial Release: Thoraco-Lumbar, Diagnostic Exercise, Part 2:

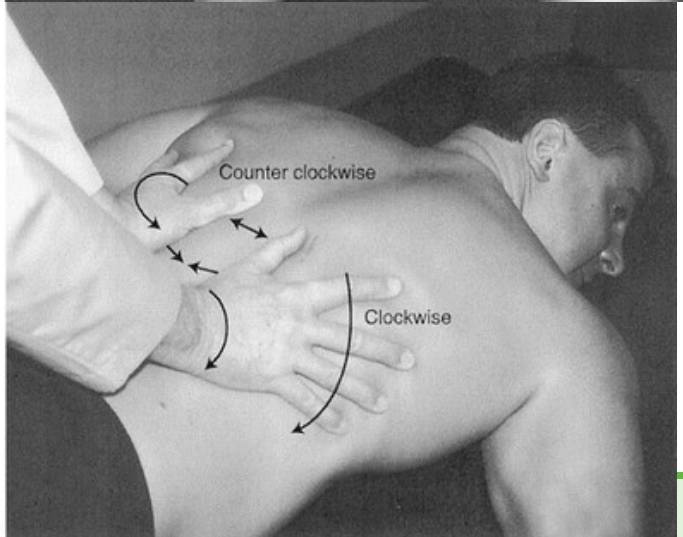
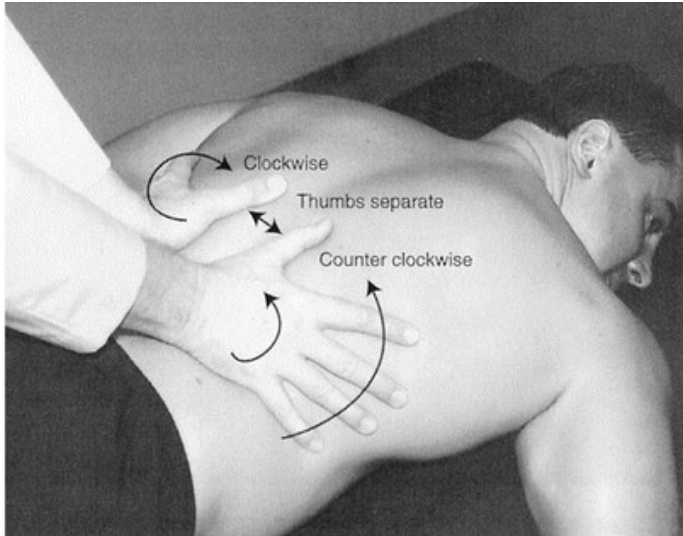
- Identify superficial and deep tightness and looseness patterns
- Compression, traction, and twist
- Keeping pressure on tissues, test preference of fascial motion:
 - Clockwise and Counterclockwise rotation
 - Superior and Inferior fascial glide
 - Medial and Lateral fascial glide



From: **Myofascial Release Figure 36.9**

Myofascial Release: Thoraco-Lumbar technique

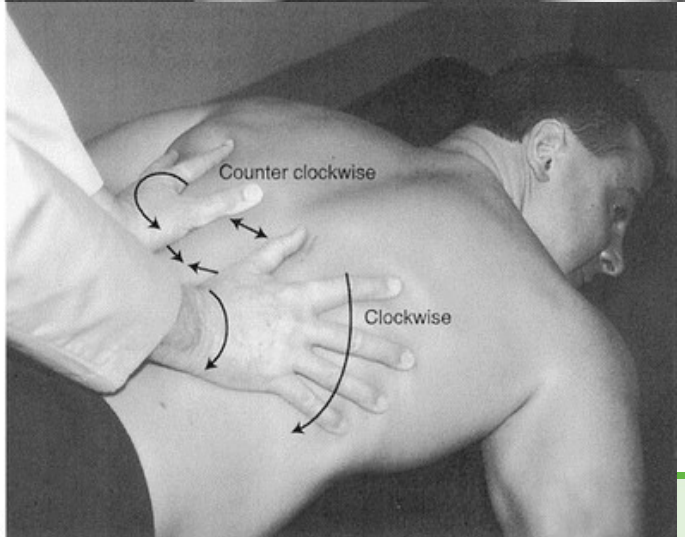
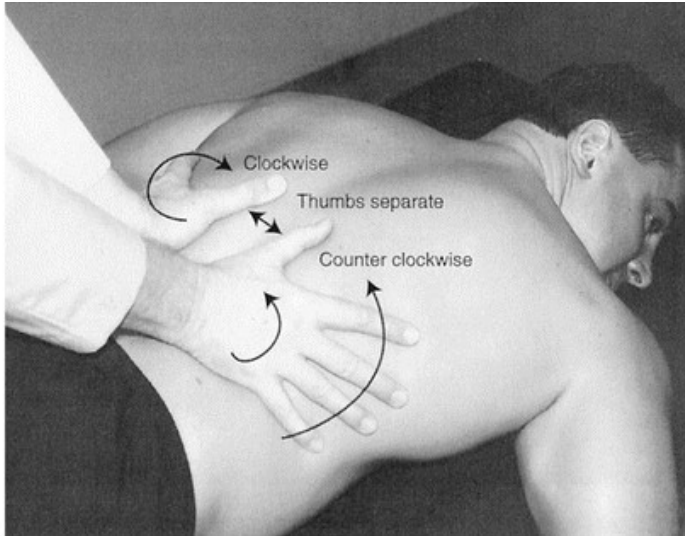
- Place widely open hands over thoracolumbar junction
- Identify superficial and deep tightness and looseness patterns
- Compression, traction, and twist
- Release enhancing maneuvers:
 - Deep respiration
 - Upper limb movements
 - Lower limb movements



From: **Myofascial Release Figure 36.9**

Myofascial Release: Thoraco-Lumbar, Re-Check

- Identify superficial and deep tightness and looseness patterns
- Compression, traction, and twist
- Keeping pressure on tissues, test preference of fascial motion:
 - Clockwise and Counterclockwise rotation
 - Superior and Inferior fascial glide
 - Medial and Lateral fascial glide



From: **Myofascial Release Figure 36.9**

Prone Sacrum – MFR Diagnostic Exercise:

Place patient in prone position

Place one hand on the sacrum
(finger pointing cephalad)

Place the other hand over top
(fingers pointing caudad)

Apply light to medium pressure
anteriorly to desired depth

Active motion testing: Monitor
motion as patient takes deep breaths

Passive motion testing: Monitor
motion by applying sacral flexion,
extension, and rotation



Tx of Sacrum with MFR in prone position

1. Load tissues anteriorly to desired depth
2. Glide tissues superiorly-inferiorly; laterally left or right, rotation clockwise/counterclockwise.
3. Hold until change in tissue is sensed
- 3b. Release Enhancing Maneuvers:
 - Respiratory efforts (deep breathe, cycle, hold)
 - Extend Back by coming up on elbows
 - Abduction of the humerus in the coronal plane
 - Flex and Straighten knees
4. Reassess



Tx of Sacrum with MFR in prone position

Add Release Enhancing Maneuvers:

- Respiratory efforts (deep breathe, cycle, hold)
- Extend Back by coming up on elbows
- Abduction of the humerus in the coronal plane
- Flex and Straighten knees



Prone Sacrum – Reassess:

Place one hand on the sacrum (finger pointing cephalad)

Place the other hand over top (fingers pointing caudad)

Apply light to medium pressure anteriorly to desired depth

Active motion testing: Monitor motion as patient takes deep breaths

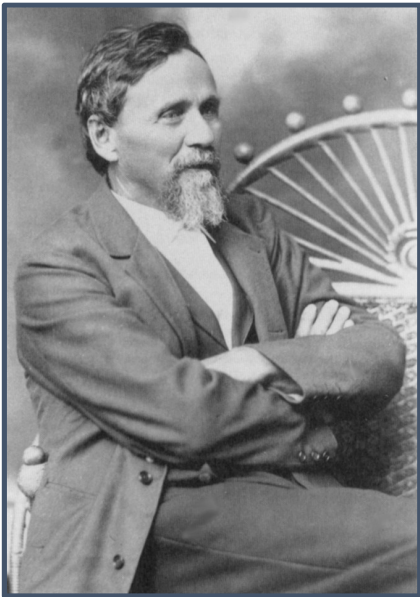
Passive motion testing: Monitor motion by applying sacral flexion, extension, and rotation



The End ---- Thank You!

**“To find health should be
the object of the doctor.
Anyone can find disease.”**

– A.T. Still, Founder of
Osteopathy



References

1. Seffinger, M. A. (ed.): *Foundations for Osteopathic Medicine* 4th Edition, Wolters Kluwer, Philadelphia, 2018. Ch 36, pp 835- (especially figures 37.7-36.9).
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3. Wilson-Pauwels, L., Sandoz Course Cranial Nerves, BC Decker Inc, Hamilton, Ontario, 1988