

The logo graphic consists of three overlapping chevron shapes pointing to the right. The largest, outermost chevron is dark blue. Inside it is a medium blue chevron, and the innermost is a lighter blue chevron. The text 'ATSU' is centered within the dark blue chevron.

**ATSU**

National Center for Osteopathic  
Principles and Practice Education

# Introduction to Osteopathic Principles and Practices

By Jonathon Kirsch, DO, C-AOBNMM, OHPF

# Jonathon Kirsch, DO



Dr. Jonathon Kirsch, DO, C-AOBNMM, OHPF, received his bachelor of science degree from the University of Wisconsin-Madison and is a 1996 graduate of A.T. Still University-Kirksville College of Osteopathic Medicine. He completed postgraduate training at Midwestern University's AZ-GME Consortium and Community Hospital Medical Center in Phoenix, Arizona, and became board certified in osteopathic manipulative medicine/neuromusculoskeletal medicine in 2003. He completed the American Osteopathic Association Health Policy Fellowship in 2011 and has recently rejoined the ATSU-KCOM faculty as Professor of Osteopathic Manipulative Medicine. Dr. Kirsch is a member of MAOPS, AOA, AAO, and the Osteopathic Cranial Academy and is board certified in NMM and OMM.

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# Goals objectives

- Describe the Four Tenets of Osteopathic Medicine.
- Define Osteopathic Manipulative Treatment (OMT).
- Define somatic dysfunction.
- Describe the characteristics of direct OMT techniques.
- Describe the characteristics of indirect OMT techniques.
- Begin to palpate somatic dysfunction using the T.A.R.T. format

# Four Tenets of Osteopathic Medicine

1. The mind, body & spirit are a unit.
2. The body is capable of self-regulation, self-healing, and health maintenance.
3. Structure and function are reciprocally interrelated.
4. Rational treatment is based upon understanding & implementing the other 3 tenets.



## PROPOSED TENETS OF OSTEOPATHIC MEDICINE

### PROPOSED PRINCIPLES FOR PATIENT CARE

**1** A person is the product of dynamic interaction between body, mind, and spirit.

**1** The patient is the focus for healthcare.

**2** An inherent property of this dynamic interaction is the capacity of the individual for the maintenance of health and recovery from disease.

**2** The patient has the primary responsibility for his or her health.

**3** Many forces, both intrinsic and extrinsic to the person, can challenge this inherent capacity and contribute to the onset of illness.

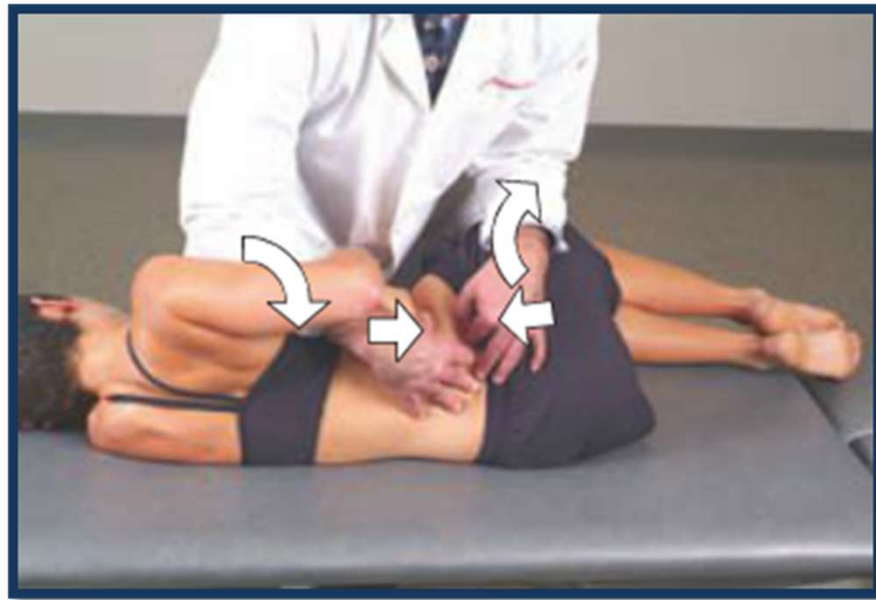
**3** An effective treatment program for patient care is founded on these tenets.

**4** The musculoskeletal system significantly influences the individual's ability to restore this inherent capacity and therefore to resist disease processes.

Rogers F, D'Alonzo G, Glover J, Korr I, Osborn G, Patterson M, Seffinger M, Taylor T, Willard F. Proposed tenets of osteopathic medicine and principles for patient care. *J Am Osteopath Assoc* 2002;102(2):63–65.

# OMT – Osteopathic Manipulative Treatment

- The therapeutic application of manually guided forces by an osteopathic physician to improve physiologic function and/or support homeostasis that have been altered by somatic dysfunction.

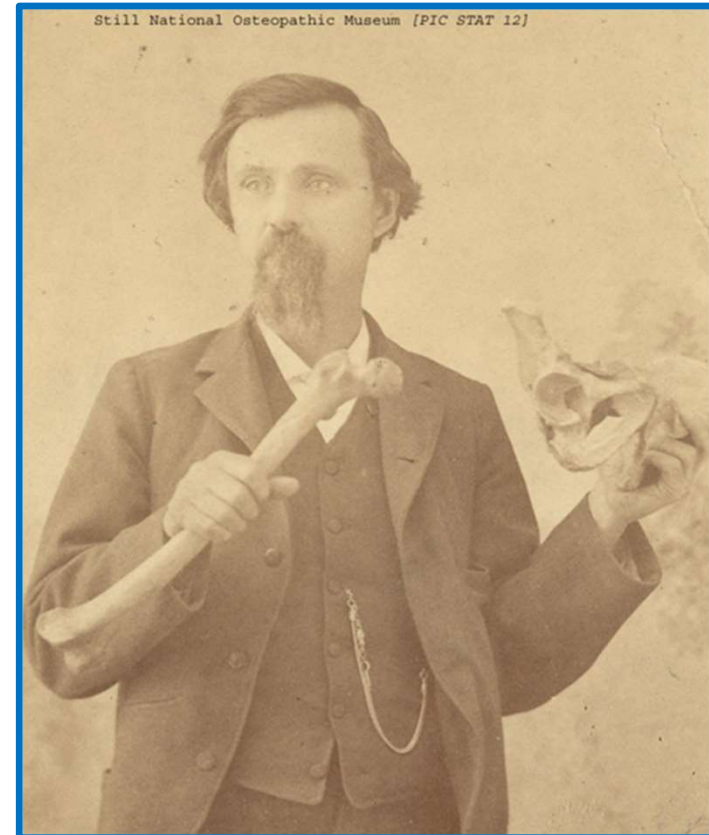


# Osteopathic manipulative medicine: Goals

- Improve function and efficiency of movement through our environment.
- Reduce pain and discomfort.
- “The most any physician can do for a patient is to render operative, the forces within the body itself.”
  - A. T. Still

# Osteopathic manipulative medicine: Goals

- “Any variation from health has a cause, and the cause has a location. It is the business of the osteopath to locate and remove the cause, doing away with the disease and getting health instead.”  
– A. T. Still



# Definition: Somatic Dysfunction

- Impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodiar, and myofascial structures, and their related vascular, lymphatic, and neural elements.
- Historically: Called, a Lesion, Still Lesion, Osteopathic Lesion.



# Dr. Andrew Taylor Still on Cause of Somatic Dysfunction

- “If we have observed the perfect, harmonious work of health, we are now prepared to adjust the machinery of life by taking all embarrassments from blood- and nerve-supply that are caused or could be caused by strains, jars, and nervous shocks or wounds that are produced by change of season, climate, and physical injuries of all kinds, be they great or small.”
- Your work is completed when you have adjusted the human body to the degree of perfection in which the God of Nature left it.
- This is the limit of your usefulness; do your work well and you will get the results sought.
- Never grow weary in well-doing; we have proven that God is true.”

# Necessity of knowing normal

- If you know normal, you can find abnormal.
- “As osteopathic machinists we go no further than to adjust the abnormal conditions back to the normal. Nature will do the rest.”

# Diagnostic Criteria for Somatic Dysfunction

## T.A.R.T. Criteria

Tissue texture abnormalities

Asymmetry of structure

Restriction of motion

Tenderness

*Any one of which must be present for  
the diagnosis of somatic dysfunction*



# Indications for OMT

- Somatic Dysfunction is the indication for OMT
- OMT, is directed specifically at the treatment of somatic dysfunctions
- To enhance homeostatic mechanisms.
- The musculoskeletal system can be a major factor in maintaining homeostasis.
- Influence on Autonomic Nervous System, Sympathetic & Parasympathetic systems.

# Absolute & Relative Contraindications to OMT

- **Absolute:** OMT carries significant risk of a serious adverse event that exceeds the expected benefit and should not be used.
- **Relative:** Caution should be used when OMT is performed because there may be a greater than usual risk of an adverse event.
  - May need to exclude treatment of specific body regions
  - May need to exclude certain types of techniques
  - Shared decision making with patient
  - One must understand of benefits vs risks
- Most absolute and relative contraindications to OMT are based on an understanding of anatomy, physiology, and pathophysiology and on the forces applied with a particular type of technique.

# General Contraindications for OMT

- Lack of Consent, (verbal or written).
- Unstable condition that involves rapid life-threatening deterioration
- If performing OMT will delay definitive diagnosis and treatment of an urgent or emergent condition.
- Without performing an appropriate history and physical evaluation, including evaluation for somatic dysfunction.
- OMT should not be specifically applied to sites of unstable anatomy if the application of forces used with the technique presents a high risk of a deleterious consequence.
- OMT should not be used when the physician's skill level makes it likely they will apply a force that overwhelms the integrity of the tissues.
- Making changes that exceed the metabolic capacity of the patient's system to adapt (dosing).

# Building Rapport While Evaluating and Treating Sensitive Areas

- Chaperone in the room as appropriate.
- Explain what you are going to do and why you are doing it before examining.
- Ask them to let you know if it is too uncomfortable or if they need you to stop.
- Tell them the names of the anatomy you are palpating:
  - Sometimes before you palpate it
  - Sometimes as you palpate it
- Tell them what you are finding throughout the exam.
- Communicate with the patient.

# Adverse Event

Is any unfavorable and unintended sign (including an abnormal laboratory finding), symptom, or disease temporally associated with the use of a medical treatment or procedure that may or may not be considered related to the medical treatment or procedure.

Side effect – unintended, secondary effect of the intended effect; may be beneficial or harmful.

Side effect is no longer a recommended term.

NCI Thesaurus. Side effect (code C2861). National Cancer Institute.

[https://nciterns.nci.nih.gov/ncitbrowser/ConceptReport.jsp?dictionary=NCI\\_Thesaurus&ns=ncit&code=C2861](https://nciterns.nci.nih.gov/ncitbrowser/ConceptReport.jsp?dictionary=NCI_Thesaurus&ns=ncit&code=C2861).

Updated June 26, 2023. Accessed August 10, 2023.

## Adverse Events

<b>Grade</b>	<b>Level</b>	<b>Classification</b>	<b>Description</b>
1	Mild	Nonserious	The event is usually transient, does not typically interfere with activities of daily living, and requires no special treatment or intervention.
2	Moderate	Nonserious	The event impacts usual daily activities but is alleviated with simple noninvasive, therapeutic treatments. Laboratory evaluation indicates injury but without long-term risk or permanent harm.
3	Severe	Nonserious	The event requires intensive therapeutic intervention and interrupts usual daily activities. It may require brief hospitalization or prolong an existing hospitalization but does not result in a persistent or significant disability or incapacity.
4	Life-threatening or disabling	Serious	A medically significant event or its immediate sequelae, which places the patient at imminent risk of death or is associated with physical or mental disabilities that affect or limit the ability of a person to perform activities of daily living. The event may result in inpatient hospitalization or prolong an existing hospitalization.
5	Death	Serious	The event is associated with termination of life.

[https://nciterms.nci.nih.gov/ncitbrowser/pages/multiple\\_search.jsf?nav\\_type=terminologies](https://nciterms.nci.nih.gov/ncitbrowser/pages/multiple_search.jsf?nav_type=terminologies)

See references at end of presentation.

OMT = Osteopathic Manipulative Treatment SM = Spinal manipulation n/d = Not Defined CVA = Cerebrovascular Accident

CATEGORY	WHAT	INCIDENCE
<p><b>Treatment-emerging transient adverse events</b><sup>1, 2, 3, 4</sup></p> <p>Non-serious Mild to moderate Grade 1 and Grade 2</p>	<p>Headache</p> <p>Stiffness / soreness</p> <p>Local discomfort in area treated</p> <p>Radiating pain / discomfort</p> <p>Fatigue / tiredness</p> <p>Nausea / vomiting</p> <p>Dizziness / imbalance</p> <p>Arm or leg weakness</p>	<p><u>Licciardone et al (2002)</u>: 8.6% of patients surveyed (n = 459) reported and attributed adverse reactions to OMT.</p> <p><u>Caigne et al (2004)</u>: 60.9% (n = 283) of patients surveyed (n = 465) reported at least one post-manipulative reaction following manual therapy.</p> <p><u>Senstad et al (1997)</u>: At least one reaction was reported by 55% of the patients sometimes during a course of treatments (SM)</p> <p><u>Leboeuf-Yde et al (1997)</u>: At least one reaction was reported by 44% of the patients during their treatment (SM)</p> <p><u>Hurwitz et al (2005)</u>: 30.4% (n = 85) of patients surveyed in the UCLA Neck Pain Study reported 212 adverse reactions following chiropractic care.</p>

**Onset and duration of reported adverse reactions**

<sup>1</sup>Caigne et al (2004) <sup>2</sup>Senstad et al (1997) <sup>3</sup>Leboeuf-Yde et al (1997) <sup>4</sup>Hurwitz et al (2005)

<sup>1</sup>Transient effects usually begins within 4 h of receiving treatment and typically resolve within the next 24 h (Caigne et al, 2004)

<sup>2</sup>Onset: within 10 min (17%), between 10 min and 4 h (47%), after 4 h (32%). Resolved: during day of treatment (72%), during day 2 (16%), during day 3 or later (7%)

<sup>3</sup>Onset: same day (58%), day 2 (32%). Resolved post-treatment: few hours after (21%), up to 24 h after (34%), between 24 h and 48 h (19%), more than 48 h (19%)

<sup>4</sup>Majority of symptoms began within 24 h of treatment, disappeared within 24 j of onset, and did not highly impact activities of daily living

<b>Substantive complications:</b> <b>Reversible<sup>5</sup></b> <b>Grade 3, if reversible</b>	Disc herniation or prolapse Nerve root compression Fracture	<u>Oliphant (2004)</u> : SM in treatment of lumbar disc herniation – clinically worsened herniation or cauda equine syndrome following SM estimated to be 1 in 3.7 million
<b>Substantive complications:</b> <b>Non-reversible<sup>6</sup></b> <b>Grade 4 and 5</b>	Death Cerebrovascular accident Spinal cord compression Cauda equina syndrome	<u>Rivett and Milburn (1996)</u> : incidence of neurovascular compromise within the range 1 in 50,000 to 1 in 5 million <u>Dvorak and Orelli (1985)</u> : 1 in 400,000 (complications n/d) <u>Patijn (1991)</u> : overall (n/d) rate 1 in 518,886 <u>Klougart et al (1996)</u> : 1 in 0.9 to 1.3 million (CVA)

<sup>5</sup>no actual data on incidence do exist; these reversible complications has been published as case-reports in the indexed literature

<sup>6</sup>the true incidence of serious complications is not known as lack of treatment data (SM and patients) makes accurate statistics impossible

#### References:

Caigne B et al. How common are side effects of spinal manipulation and can these side effects be predicted? *Manual Therapy* 9 (2004) 151 - 156

Dvorak J, Orelli F. How dangerous is manipulation to the cervical spine? *J Manual Med* 1985; 2: 1 - 4

Hurwitz E et al. Frequency and clinical predictors of adverse reactions to chiropractic care in the UCLA neck pain study. *Spine* 2005; 30: 1477-1484

Klougart N et al. Safety in chiropractic practice, part 1: the occurrence of cerebrovascular accidents after manipulation to the neck in Denmark from 1978 to 1988. *J Manipulative Physiol* 1996; 19: 371 - 7

Lebeouf-Yde C, Hennius B, Rudberg E et al. Side effects of chiropractic treatment: a prospective study. *J Manipulative Physiol Ther* 1997 (Oct); 20(8): 511-5

Licciardone J et al. Patient satisfaction and clinical outcomes associated with osteopathic manipulative treatment. *J Am Osteopath Assoc* 2002; 102: 13 - 20

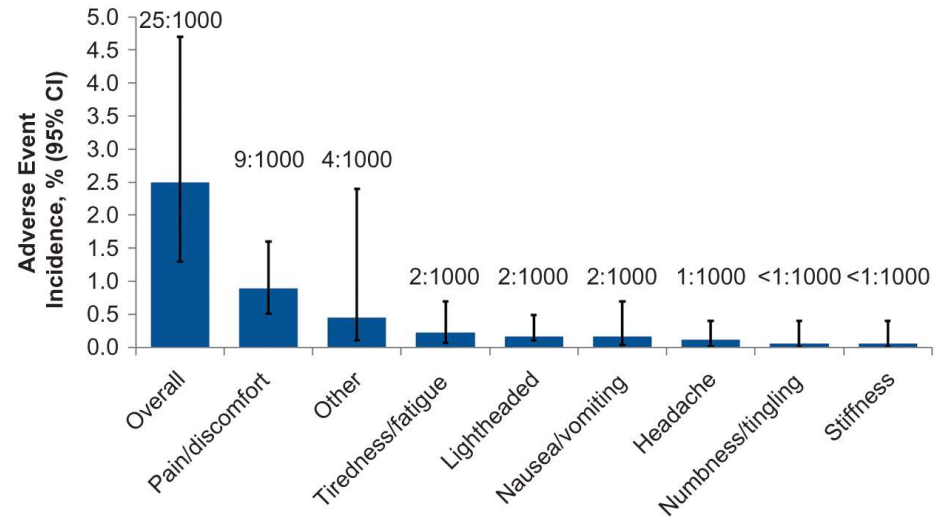
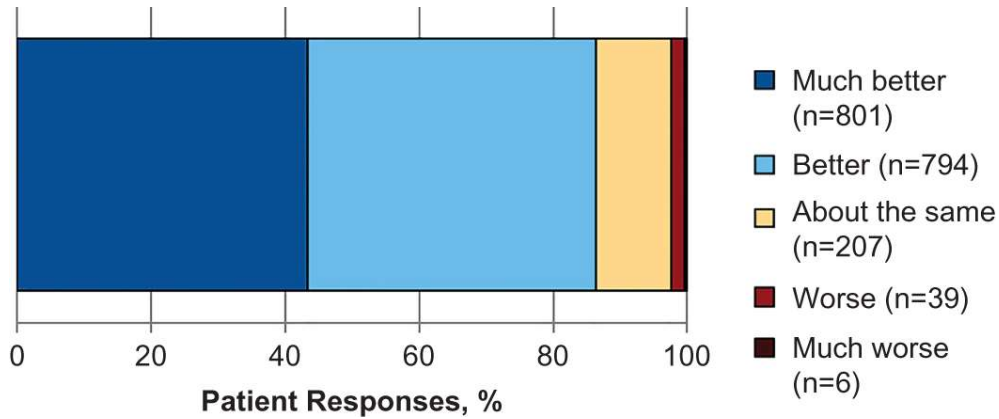
Oliphant D. Safety of spinal manipulation in the treatment of lumbar disc herniations: a systematic review and risk assessment. *J Manipulative Physiol Ther* 2004; 27: 197 - 210

Patijn J. Complications in manual medicine. *J Manual Med* 1991; 6: 89 – 92

Rivett D, Milburn P. A prospective study of cervical spine manipulation. *J Manual & Manipulative Therapy* 1996; 4: 166 - 170

Senstad O, Lebeouf-Yde C, Borchgrevink C. Frequency and characteristics of side effects of spinal manipulative therapy. *Spine* 1997; 22: 435 - 440

# Adverse Events Immediately After OMT



**Patient-reported responses immediately after osteopathic manipulative treatment (N=1847 office visits)**

Degenhardt BF, Johnson JC, Brooks WJ, Norman L. Characterizing Adverse Events Reported Immediately After Osteopathic Manipulative Treatment. *The Journal of the American Osteopathic Association*. 2018;118(3):141-149. doi:10.7556/jaoa.2018.033

# Incidence of Reported Adverse Events Associated with Manual Therapies

- Most adverse events are non-serious mild to moderate  
2.5% to 60.9%
  - Most begin within 24 hours
  - Most resolve within 48 hours
- Mild to moderate local pain and discomfort in the area of treatment.
- Aggravation of presenting complaint:
- Stiffness, headache, muscle spasm, radiating pain, tiredness and fatigue.
- Pain outside the area of treatment
- Lightheadedness, nausea, vomiting numbness and tingling.

# General Considerations for OMT

- The ability to perform OMT well requires continuous feedback to the physician's hands from the tissues of the patient
- During the OMT, the physician must remain alert to palpatory sensations that indicate where the problem is located and how the tissues are responding to the treatment while it is being performed.
- Let your fingers do the walking, let your fingers do the talking.

# General Considerations for OMT

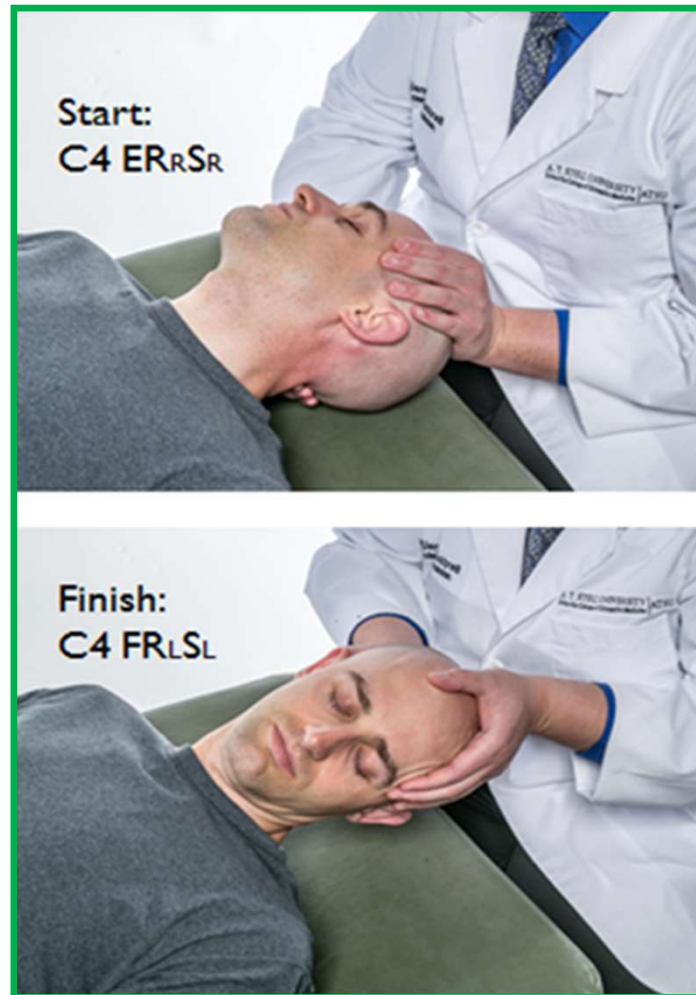
- One technique may treat more than one type of dysfunction.
- More than one type of technique may be required to treat a single type of dysfunction.
- During OMT, many different types of techniques may be employed.

# Dosing

- Is more always better?
- The dose of treatment is limited by the patient's ability to respond to treatment.
- The physician may want to do more and go faster; however, the patient's body must have time to make the necessary changes toward health and recovery.

# Dosing Guidelines

- “Find it, fix it, and leave it alone.”
  - A.T. Still
- Allow the patient, time to respond.
- The ability of patients to respond is variable.



# Dosing Guidelines

- The sicker the patient, the less the dose.
- Caring compassionate novices, often err on the side of overdose.
- Allow time for the patient to respond to treatment.
- Do not waste the dose on insignificant areas. Concentrate on key areas needing treatment.
- Chronic disease requires chronic treatment.
- Acute cases should have a shorter interval between treatments; as they respond, the interval is increased.

# Dosing Guidelines

- Pediatric cases can be treated more frequently.
- Children get sick faster, get better faster, most of the time
- Geriatric patients need a longer interval to respond to treatment.



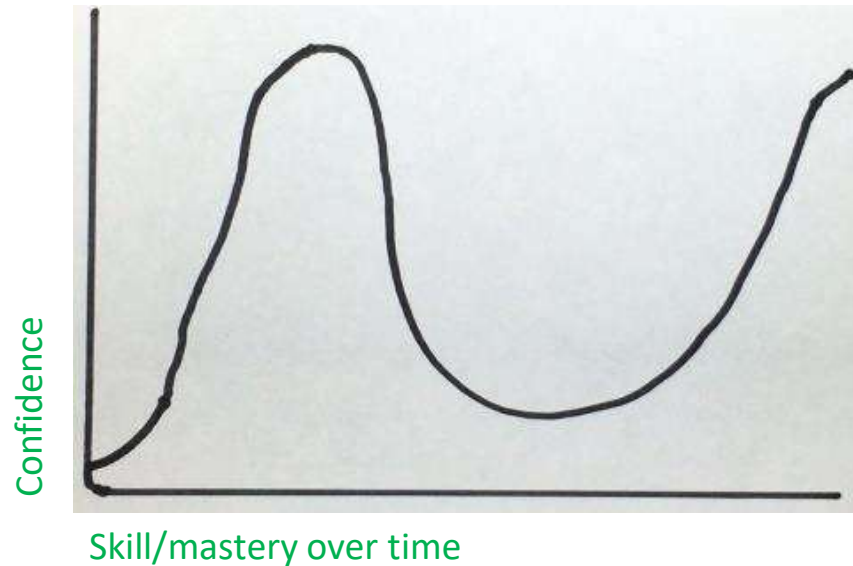
# Two Major Factors Determine Technique Choice

- The ability of the physician to execute a technique.
- The ability of the patient to respond to the type of technique.



## Physician's Ability

- Physician's knowledge and skill with the various techniques.
- Physician's age, strength and body habitus.
- Availability of a treatment table.
- Hospital, home or office setting.

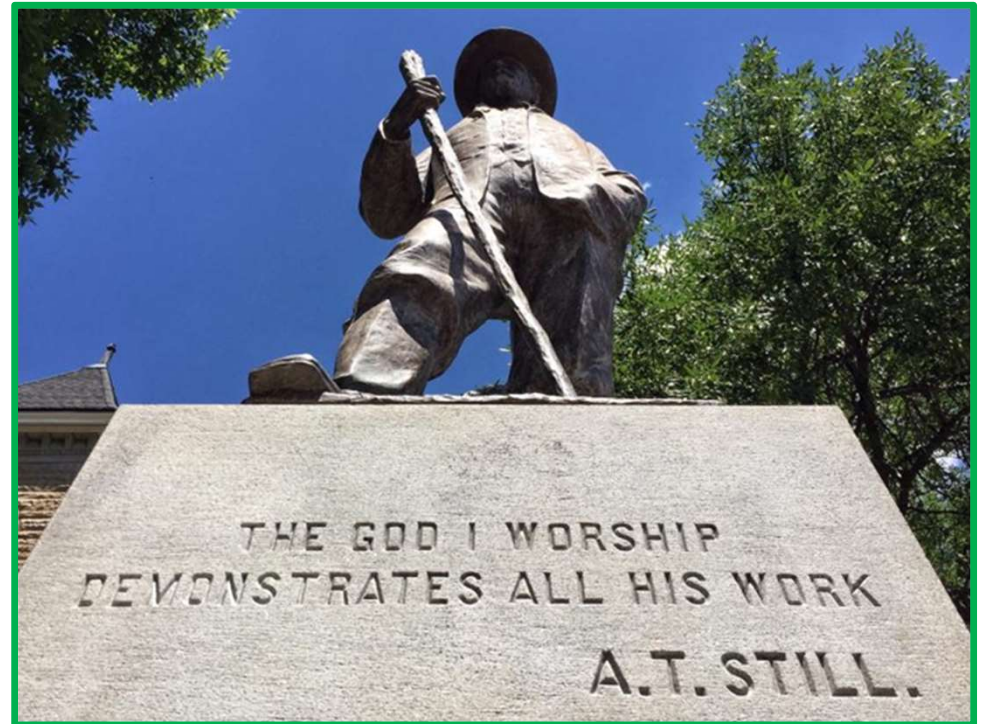


# Patient's Ability To Respond

- The patient's physical condition and stamina.
- The Patient's age.
- Acuteness or chronicity of problem / problems.
- Ability of patient to move into certain positions.
- Location of dysfunction or injury.
- Effectiveness of previous techniques used.
- Contraindications to certain techniques in specific patients.

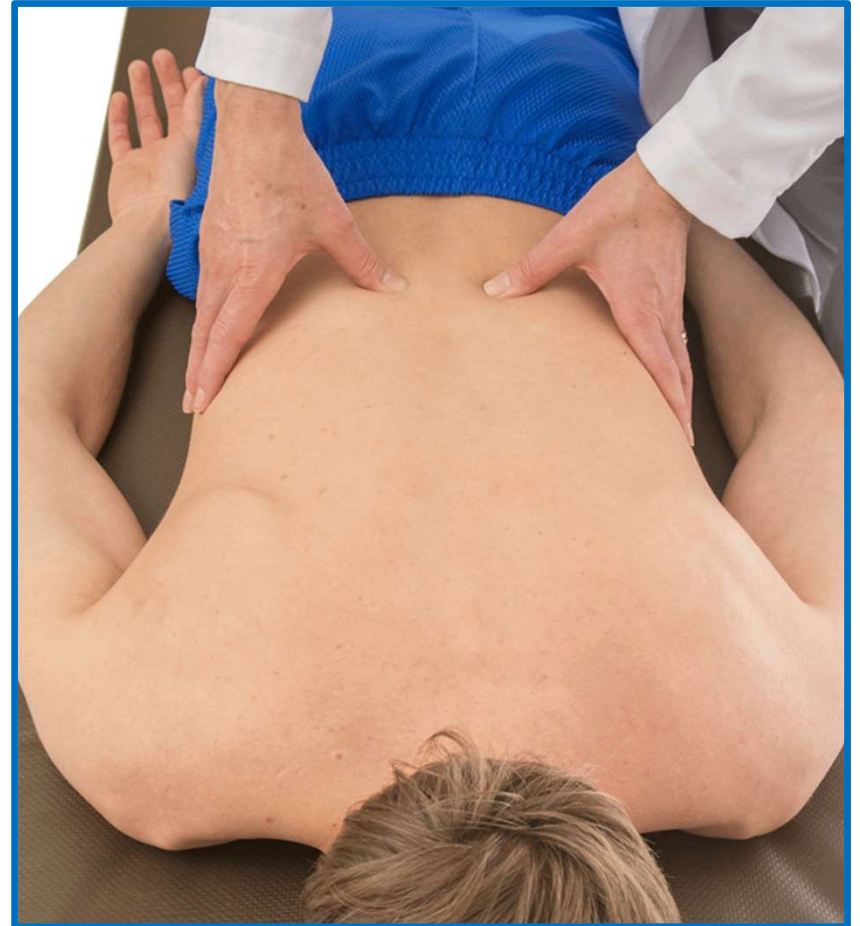
## A. T. Still on Technique Selection

- “Every operator should use his own judgment and choose his own method of adjusting all bones of the body.
- It is not a matter of imitation and doing just as some successful operator does, but the bringing of the bone from the abnormal to the normal.”

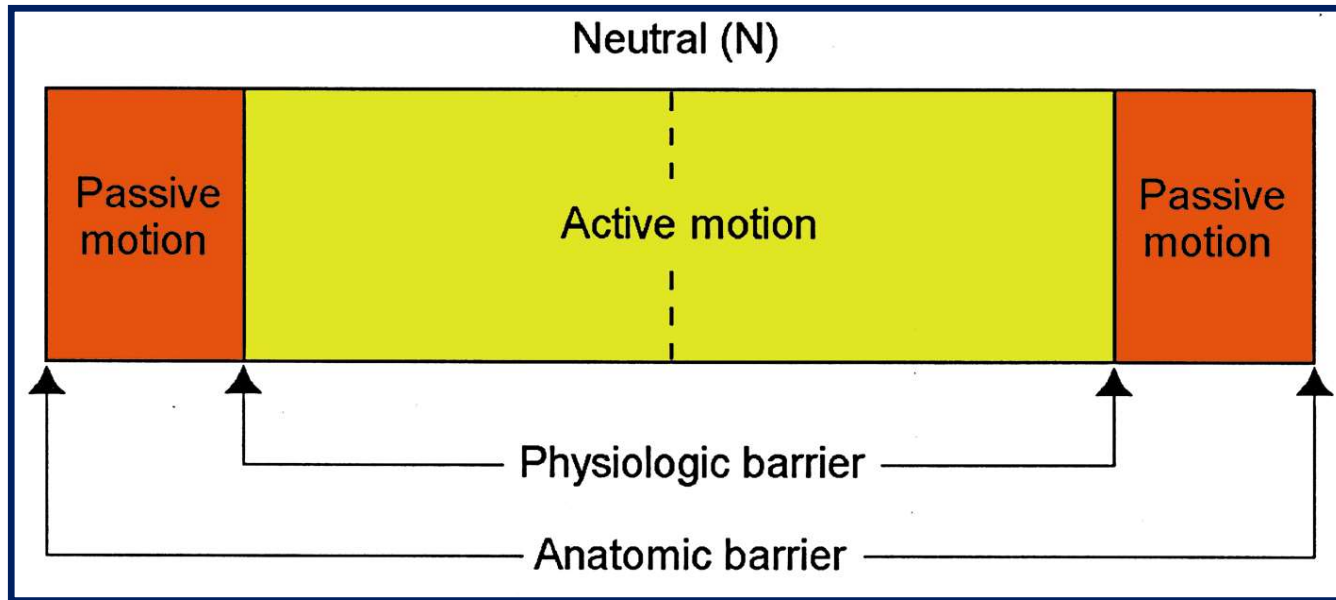


# Plan of Intervention

- Decisions made based on answering the following questions:
  - What doesn't move?
  - What direction will it move?
    - Consider all 3 planes of motion!
  - In which direction doesn't it move?
- **GOAL:** Restore lost motion in order to improve physiologic function and/or support homeostasis



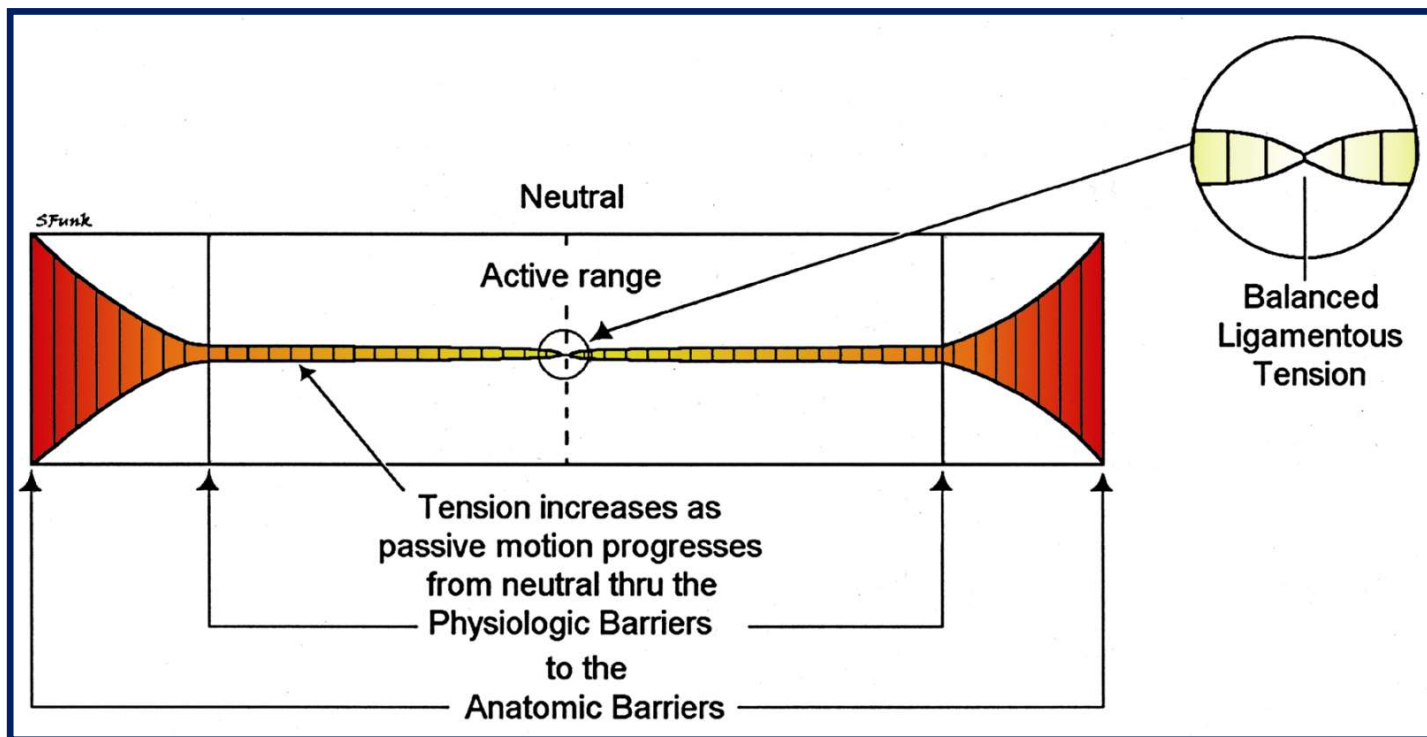
# Joint Or Tissue Motion



1. Active motion
2. Physiologic barrier
3. Passive motion
4. Anatomic Barrier

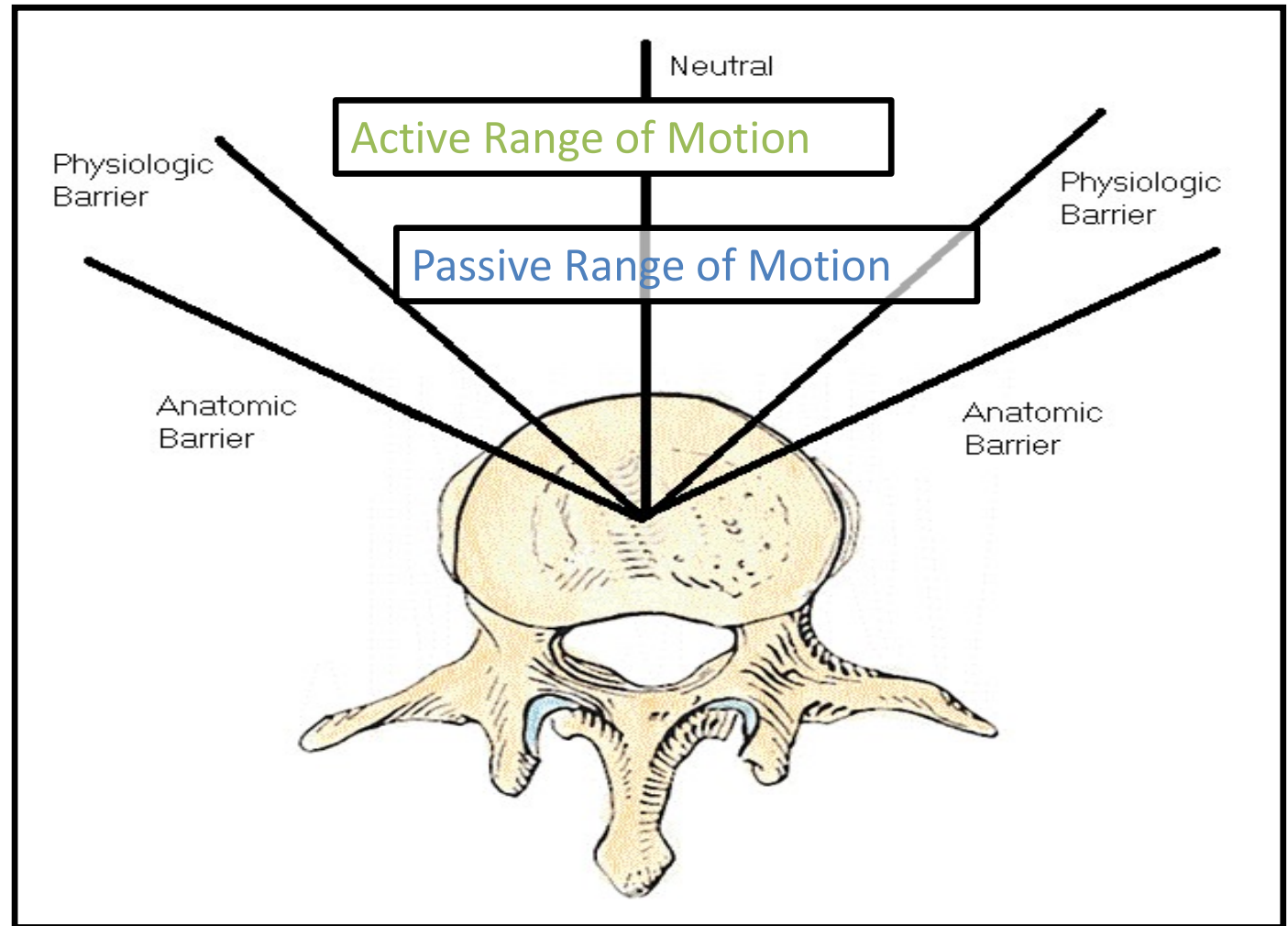
# Joint or Tissue Tension

- Neutral position: Balanced ligamentous tension.
- Physiologic barrier: Tension increases to here.
- Anatomic barrier: Maximum tension here.



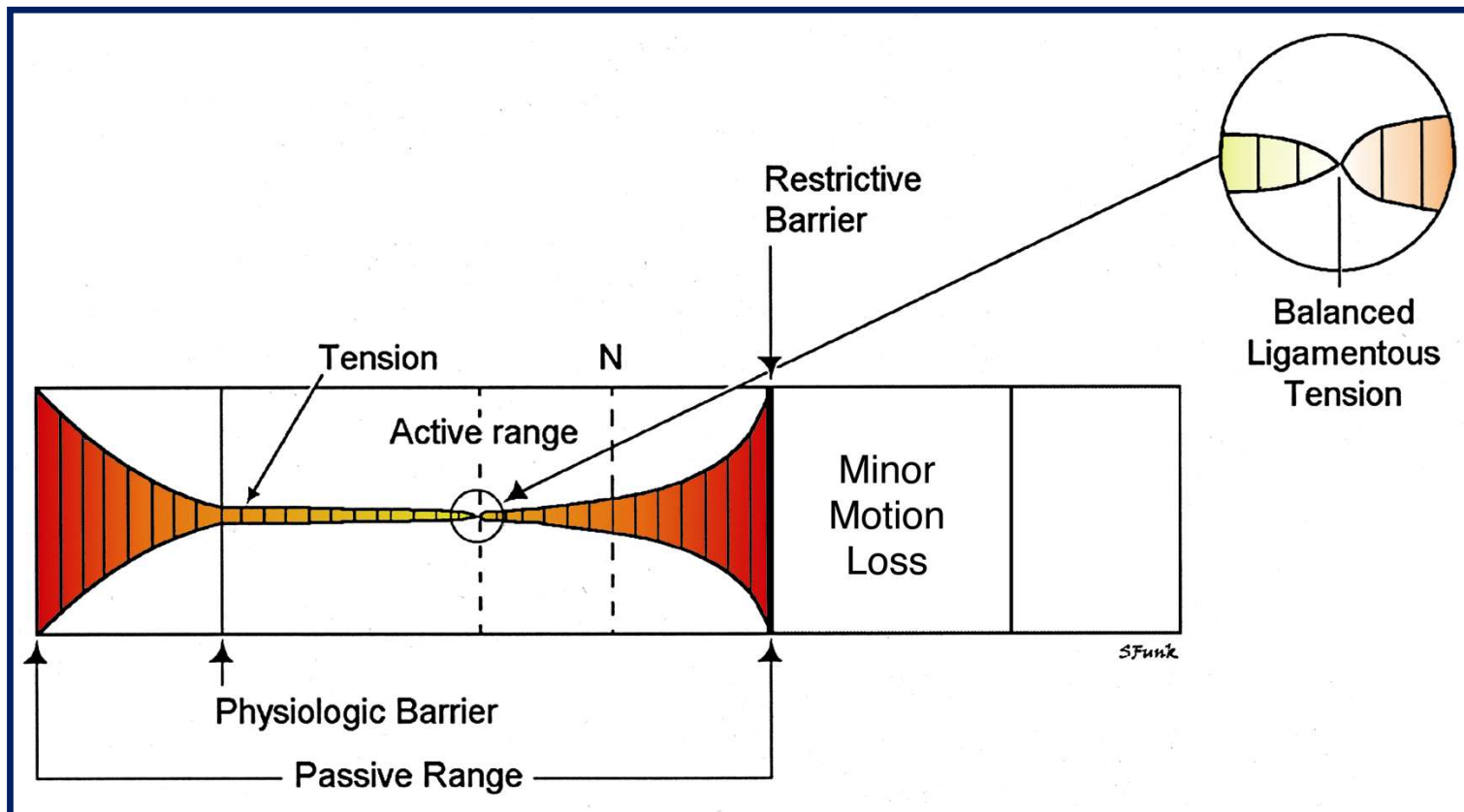
## Normal Physiologic Motion

- **AROM** – motion permitted during use of muscles
- **PROM** – motion permitted with passive movement



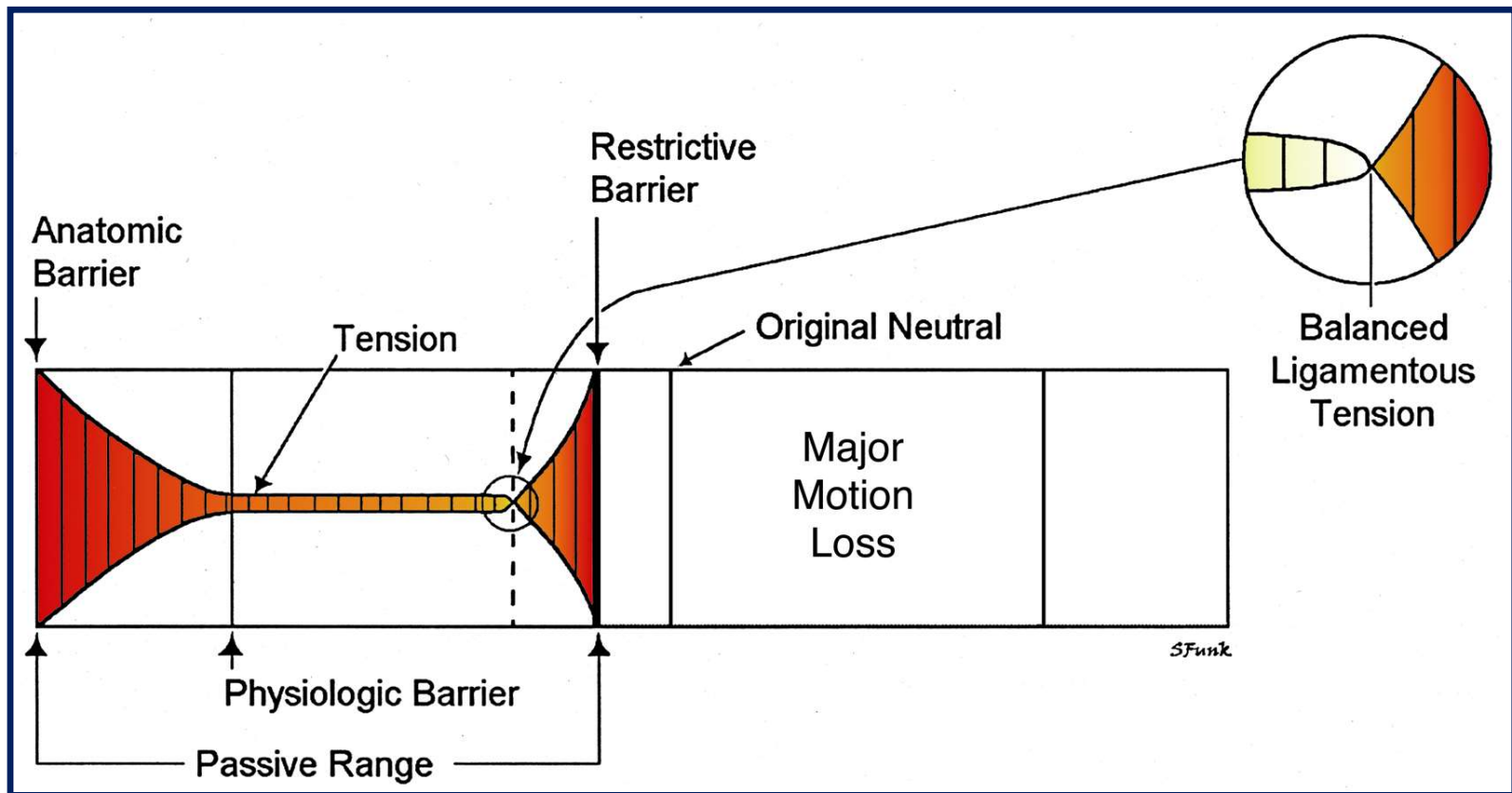
# Somatic Dysfunction

- Restrictive Barrier: Minor or major motion loss depending on the severity of the restriction.



# Somatic Dysfunction

- Restrictive Barrier: Minor or major motion loss depending on the severity of the restriction.



# Two Primary Divisions of Osteopathic Techniques

- Direct Techniques
- Indirect Techniques
- (Combined)
  - A planned sequence
  - Part of the technique is indirect and then a direct component is added (e.g. Still Technique).
  - Part of the technique is direct and then an indirect component is added (less common).
- The two treatment methods determine how the physician initially positions the patient relative to the restrictive barrier.

## Direct Technique/Method

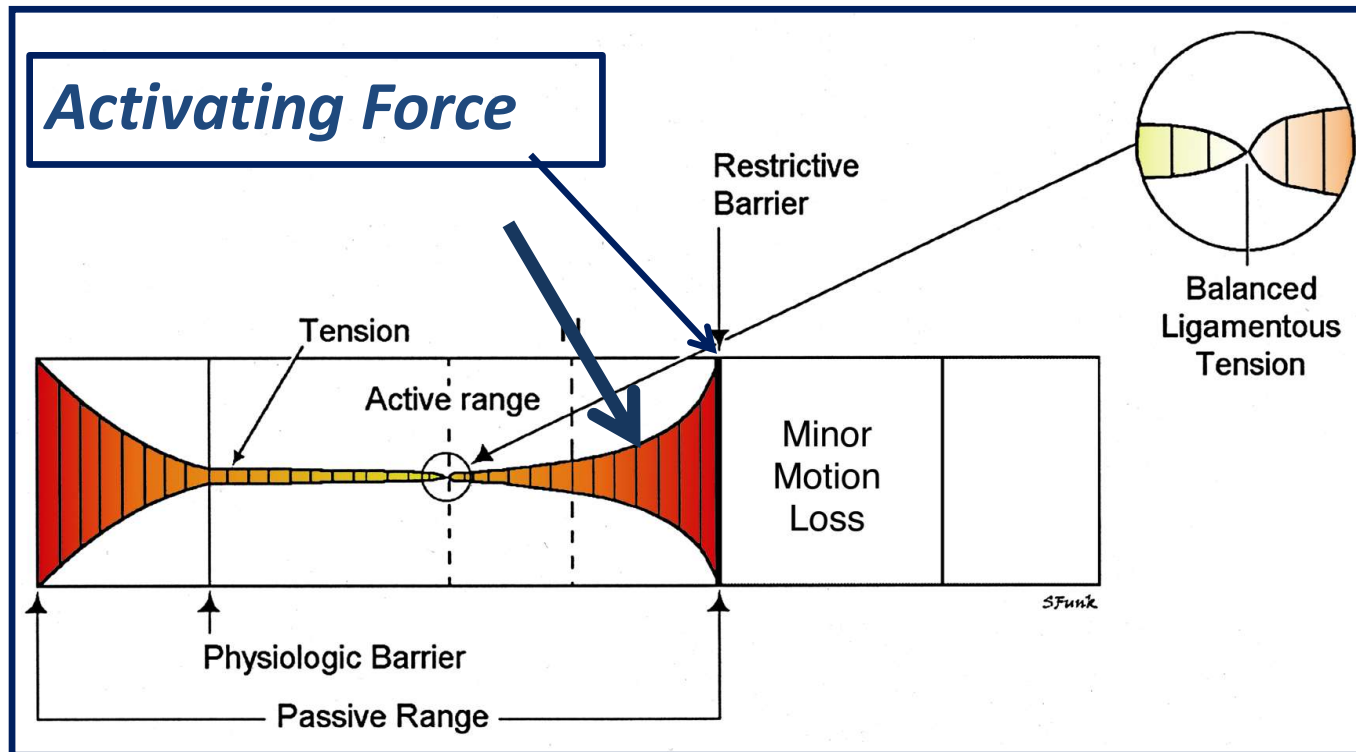
- An osteopathic treatment strategy by which the restrictive barrier is engaged, and a final activating force is applied to correct somatic dysfunction.



# Direct Techniques

- From its resting position, the restricted joint or tissue is taken toward the restrictive barrier.
- Generally, the restricted part is carried to the barrier in one or more planes of motion at the beginning of the technique.
- Activating forces are used to carry the dysfunctional component through the restrictive barrier.
- Usually involves a greater amount of force than indirect techniques.

# Direct Techniques



For example:

Soft tissue, Articular, Springing (LVMA), Myofascial Release, Muscle Energy, Thrust techniques (HVLA)

## Indirect Technique/Method

- A manipulative technique where the restrictive barrier is disengaged, and the dysfunctional body part is moved away from the restrictive barrier until tissue tension is equal in one or all planes and directions.

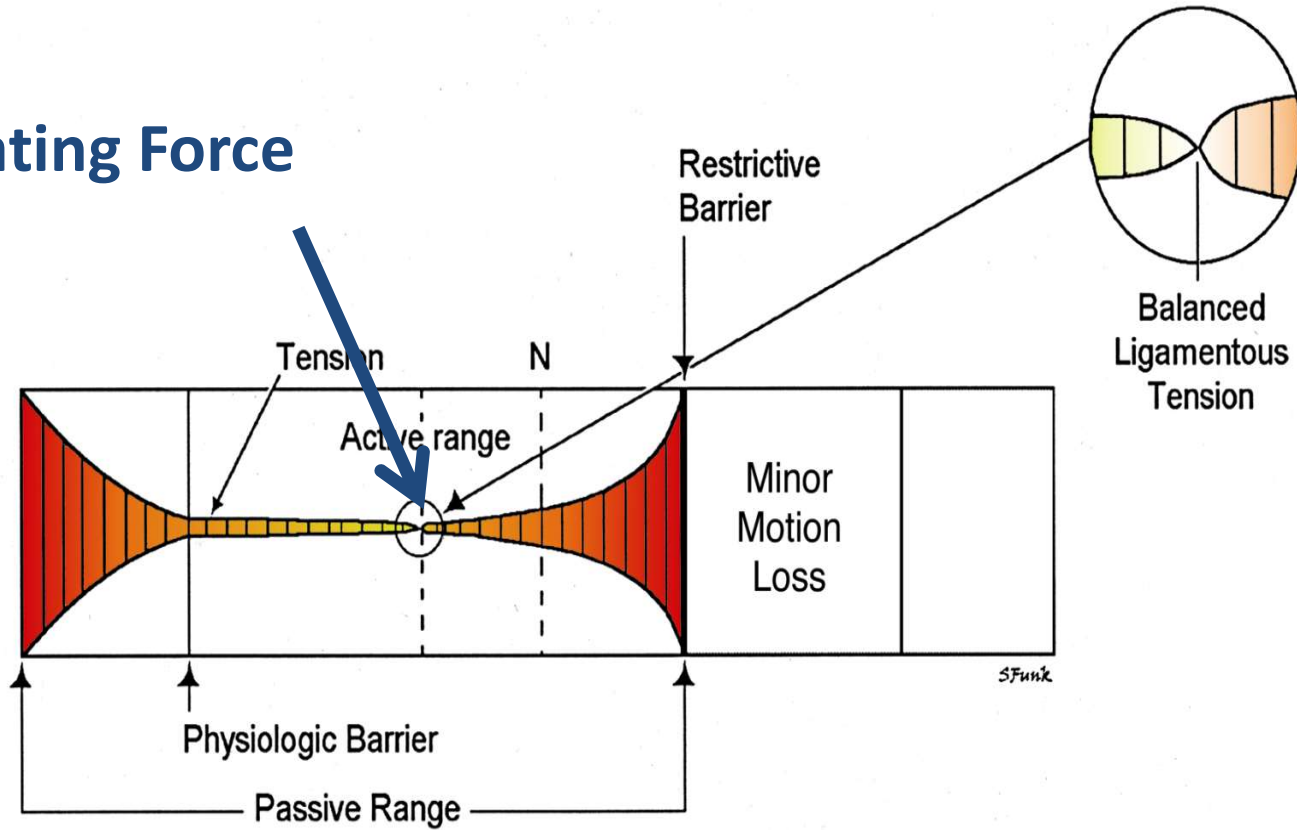


# Indirect Techniques

- Move the involved joint or tissues, away from the restrictive barrier.
- Joint or tissues of interest are moved in the direction of ease (decreasing tension).
  - Until tissue tension is equal in one or all planes.
- Joint or tissue is maintained in the position of ease,
  - 5 seconds to several minutes depending on technique type.
- Release is due to inherent forces rather than physician forces.
- Tensions gradually relax and enhanced mobility occurs.
- Usually comfortable for the patient during the technique.

# Indirect Techniques

**Activating Force**



# Indirect Techniques

- May focus on balancing different tissues
- Muscle – Counter strain
- Fascia
- Bone
- Joint capsule and associated ligamentous structures
  - Balanced ligamentous tension technique
  - Functional technique

## Ease and Bind

- **Direction of Bind:** Palpable resistance to motion of an articulation or tissue
  - **Synonym:** Resistance
- **Direction of Ease:** Relative palpable freedom of motion of an articulation or tissue
  - From the structure's resting position, this will usually be away from the restrictive barrier
  - **Synonyms:** compliance, resilience, balance, breathing, freedom of motion

# Diagnostic Criteria for Somatic Dysfunction

## T.A.R.T. Criteria

Tissue texture abnormalities

Asymmetry of structure

Restriction of motion

Tenderness

*Any one of which must be present for  
the diagnosis of somatic dysfunction*

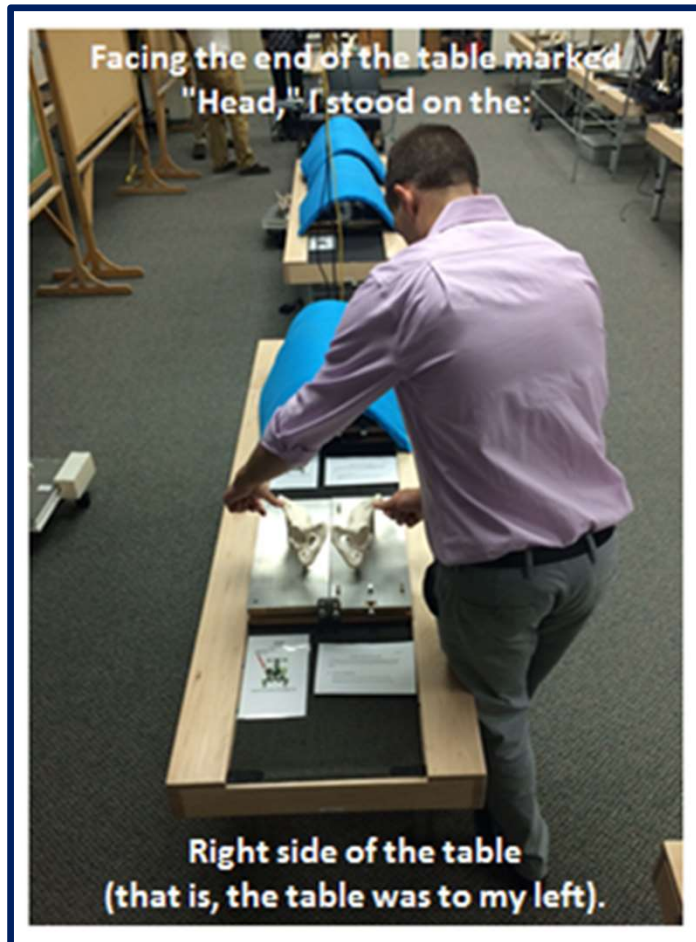


## Dominant Eye

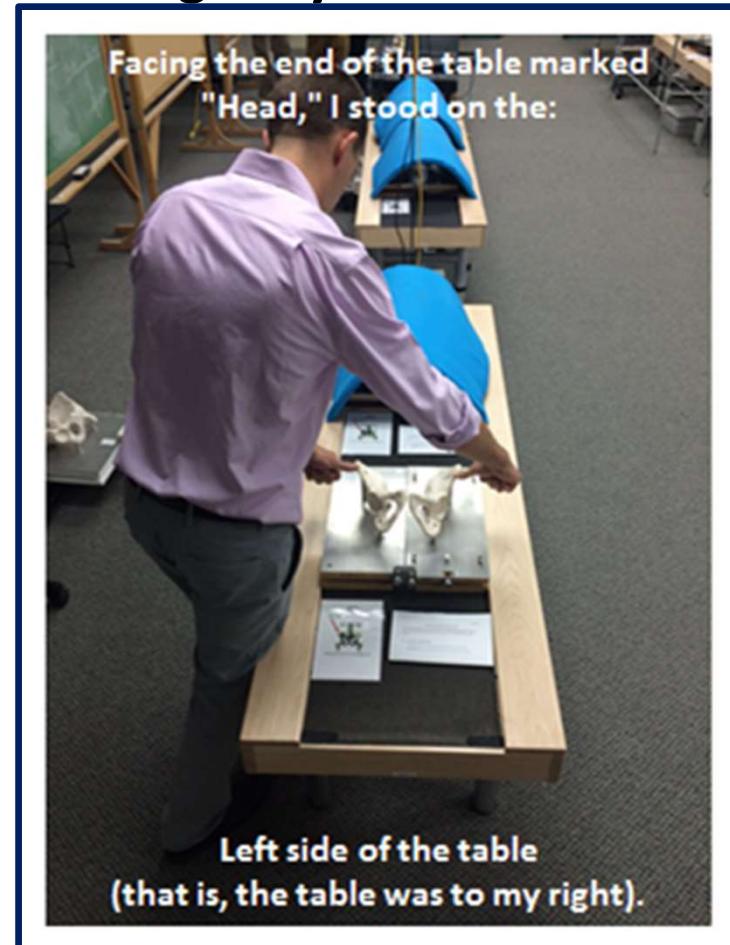
- Clinically, it is useful to know which of your eyes is your dominant eye so that you can place it towards the middle of whatever you are observing and/or palpating.

# Dominant Eye towards center of table

**Left eye dominant**



**Right eye dominant**



# Sighting Dominance

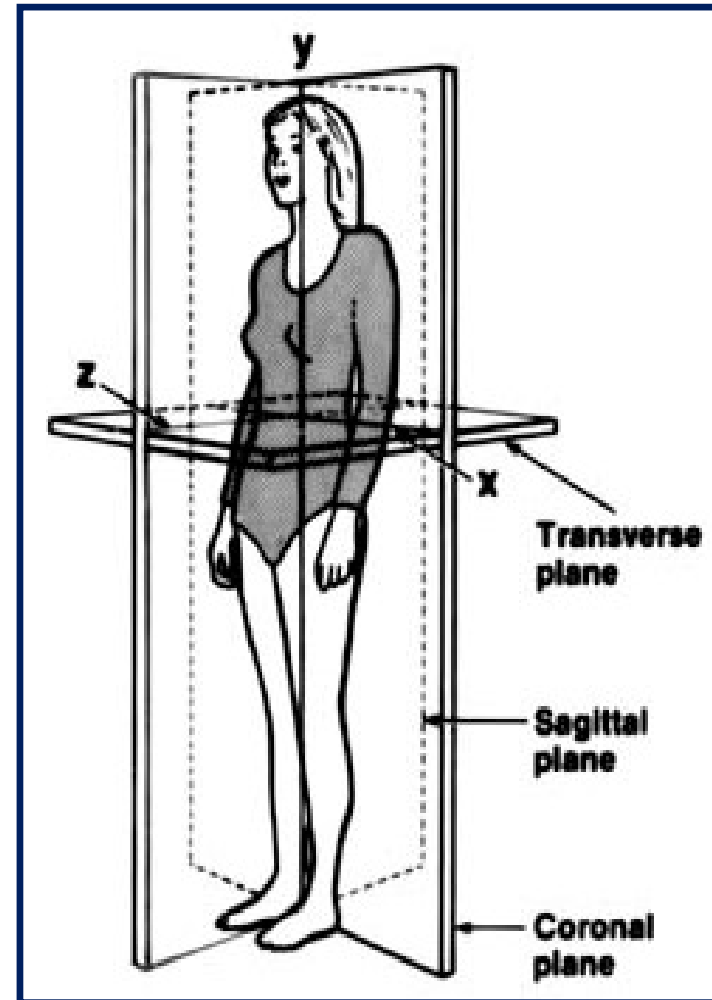
## Modified Hole-in-the-Card test

- Hold a card that has a 3-cm hole in the center, with both hands at arm's length
- View a target 6m away through the hole with both eyes open.
- Close one eye then the other to identify the dominant one.
- When the dominant eye is closed, the target will disappear.
- When the non-dominant eye is closed, the target will not disappear.



# PLANES & AXES OF MOTION (summary)

- **Coronal Plane:**  
Side bending around an AP axis.
- **Sagittal Plane:**  
Flexion/extension around a transverse (horizontal) axis.
- **Transverse (horizontal) Plane:**  
Rotation around a Superior/inferior (vertical) axis.



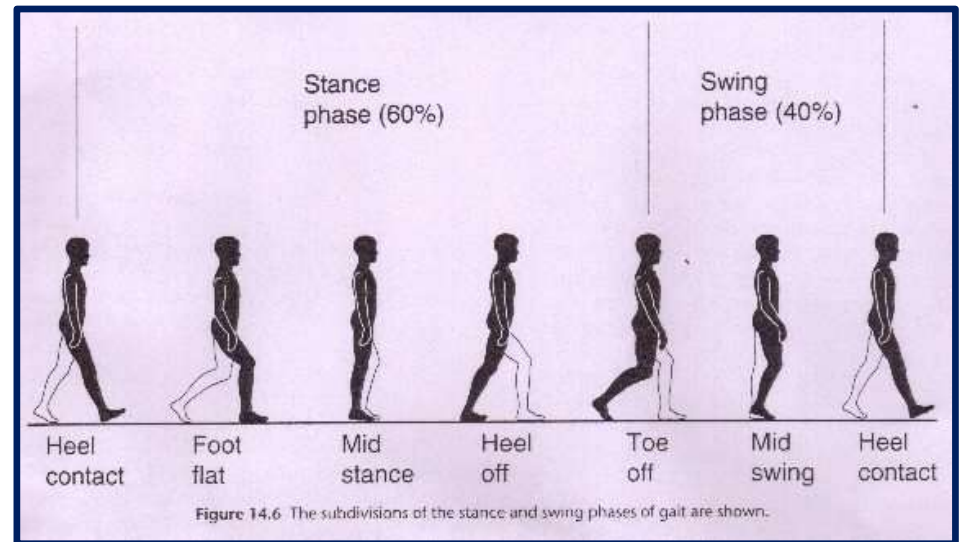
# INSPECTION: Gait

## DYNAMIC (MOTION)

- Observe and assess a patient's gait:

For example, a limp, lean, one leg or foot turns out, space of arm from body, etc.

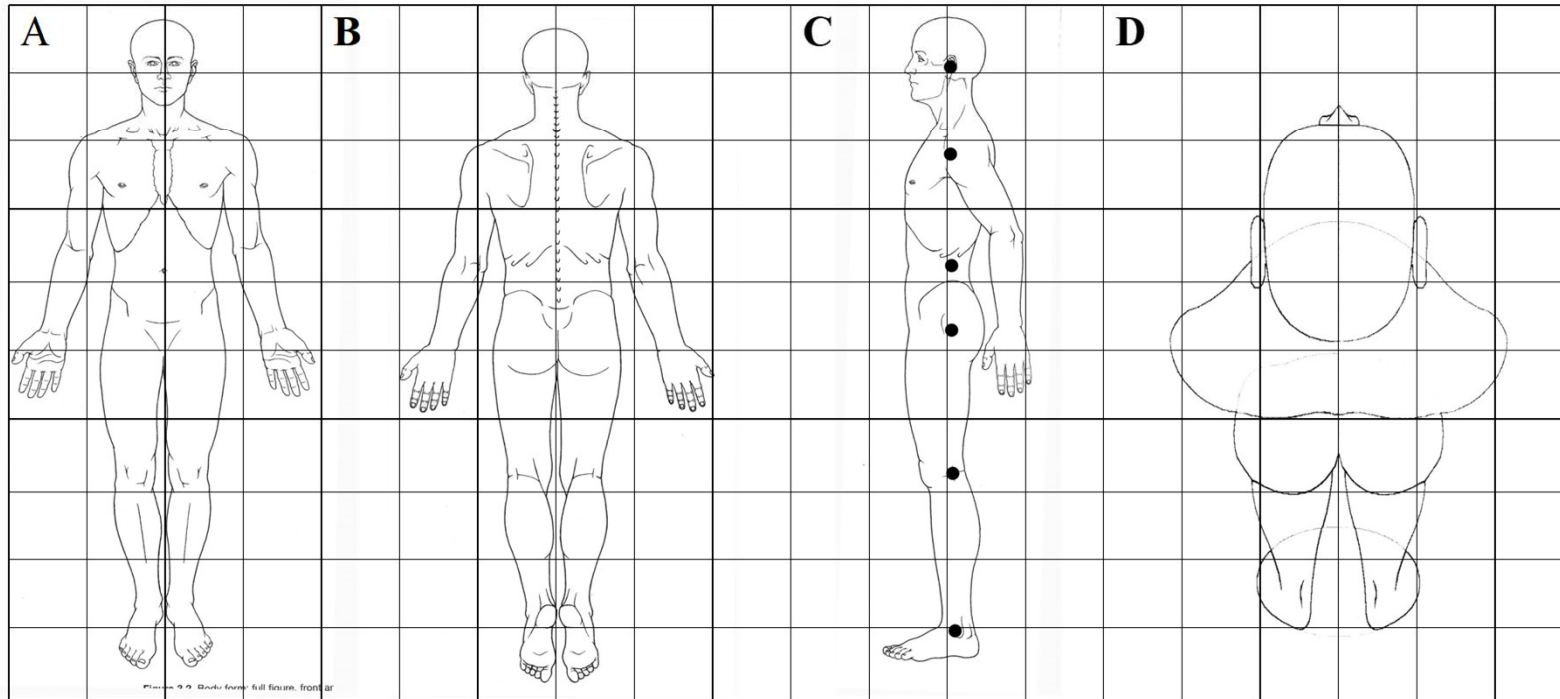
Any area not moving?



Department of Osteopathic Manipulative Medicine  
 Kirksville College of Osteopathic Medicine, Kirksville

Osteopathic Theory and Methods
OMS1 Palpatory Lab   Date:
Name

VISUAL and PROPRIOCEPTIVE EVALUATION



AP View - Coronal Plane	PA View - Coronal Plane	Lateral View - Sagittal Plane	Overhead view - Horizontal Plane
Eyes	Mastoid Processes	External Auditory meatus	Head
Earlobes	Shoulders	Mid -Shoulder	Shoulders
Shoulders	Inferior scapular angle	Greater trochanters	Hips
Iliac crests	Iliac crests	Lateral Malleolus	
Knees	Popliteal folds	Body of L3 (X-ray)	

# Lab Exercise #1

## INSPECTION: Gait

### DYNAMIC (MOTION)

- Observe and assess a patient's gait:

For example, a limp, lean, one leg or foot turns out, space of arm from body, etc.

Any area not moving?

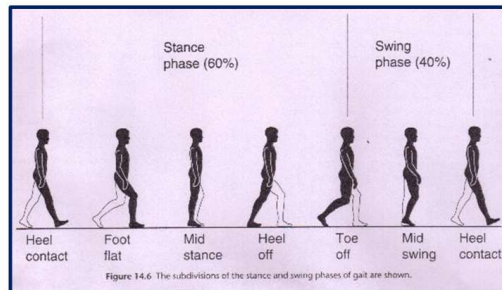


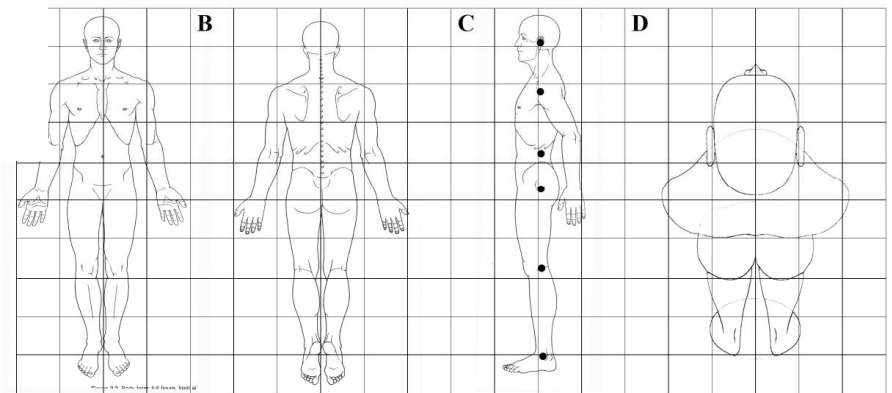
Figure 14.6 The subdivisions of the stance and swing phases of gait are shown.

## Postural Inspection

Department of Osteopathic Manipulative Medicine  
Kirksville College of Osteopathic Medicine, Kirksville

Osteopathic Theory and Methods
OMS1 Palpatory Lab [Date: _____]
Name _____

### VISUAL and PROPRIOCEPTIVE EVALUATION



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AP View - Coronal Plane	PA View - Coronal Plane	Lateral View - Sagittal Plane	Overhead view - Horizontal Plane
Eyes	Mastoid Processes	External Auditory meatus	Head
Earlobes	Shoulders	Mid -Shoulder	Shoulders
Shoulders	Inferior scapular angle	Greater trochanters	Hips
Iliac crests	Iliac crests	Lateral Malleolus	
Knees	Popliteal folds	Body of L3 (X-ray)	

# Palpation

- “The art of palpation is one that must be developed. The ability to evaluate the ‘feel’ of the tissues can be developed only by practice and conscientious application to an extraordinary degree.”

# Tissue Texture Abnormality Findings

## Acute

- Skin; hot, erythemic, moist (Sudomotor)
- Tissue; swollen, increased turgor
- Muscle; hypertonic, tender, spasm
- Pain; severe, sharp

## Chronic

- Skin; cold, pale, dry, increased drag
- Tissue; fibrotic, atrophy, ropey
- Muscle; hypotonicity, flaccid
- Pain; achy and dull

# Red Reflex

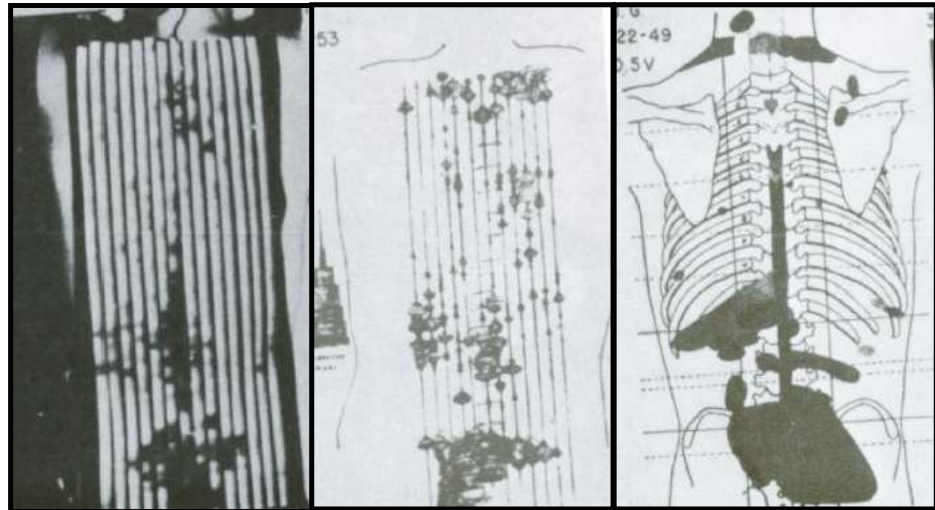
## A Red Response

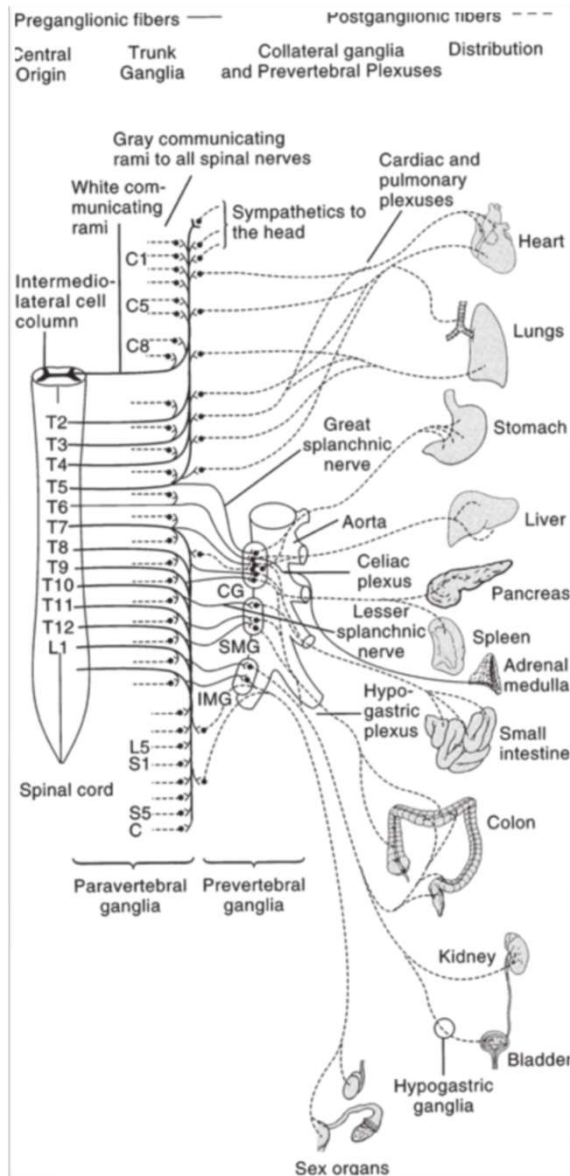
- *Drag fingers along paraspinal muscles.*
- *Watch for red response.*
- *Note areas that remain **red** long after other areas resolve.*



# Red Reflex

- *Reactive hyperemia*, is greater in degree and duration in an area of acute somatic dysfunction as compared to an area of chronic somatic dysfunction.
  - Reflection of the segmentally related sympathicotonia commonly observed in the paraspinal area





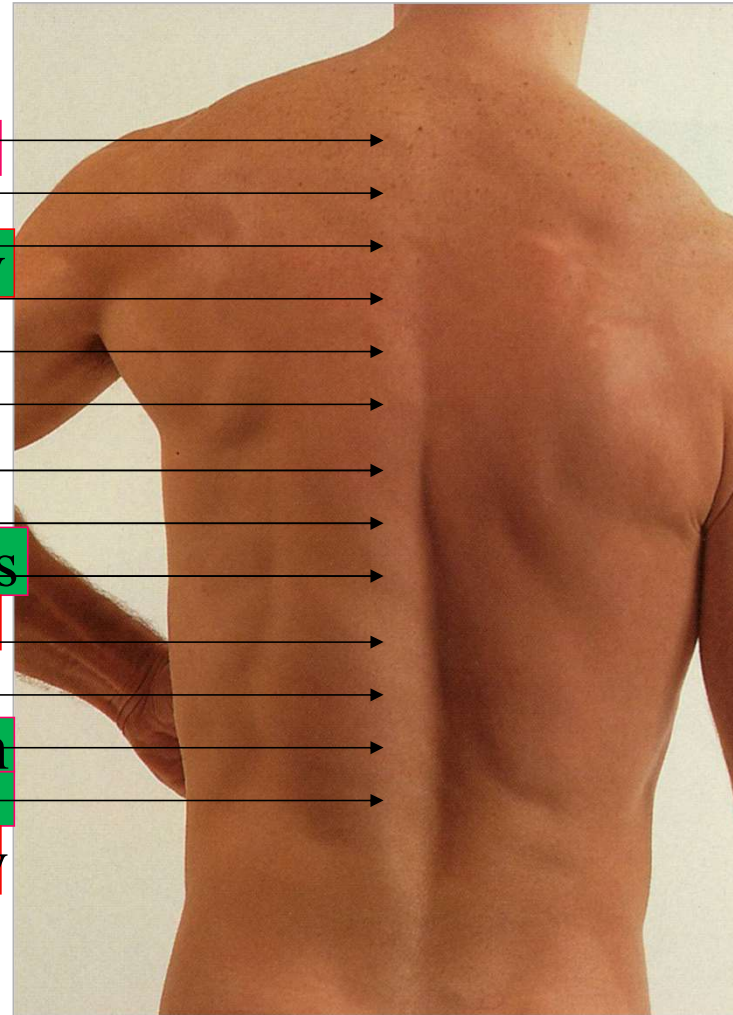
## Sympathetic Nervous System

- Primary purpose is to stimulate the body's fight-or-flight response.
- Preferentially will shunt blood from the viscera to the musculoskeletal system, heart and brain
- Sympathetic chain (paravertebral) ganglia (T1 - L2,3) and prevertebral ganglia (celiac, superior and inferior mesenteric)
- Primarily innervates viscera and the entire body's vasculature

Sympathetic division of peripheral autonomic system. CG, celiac ganglion; SMG, superior mesenteric ganglion; IMG, inferior mesenteric ganglion. (From Chusid JG. Correlative Neuroanatomy and Functional Neurology, Los Altos, CA: Lange Medical Publishers, 1985, with permission.)

# Somatotopic Relationships to Sympathetic Function

- T1-4 Head and Neck
- T1-6 Heart, Lungs
- T2-8 Upper Extremity
- T2-8 Esophagus
- T5-9 Upper GI System
- T10-11 Mid GI System
- T10-Kidney
- T 10-11-Ovaries, Testes
- T11-L1 Upper Ureter
- T12-L2 Bladder
- T12-L2 Lower GI System
- T12-L2 Uterus, Prostate
- T11-L2 Lower Extremity

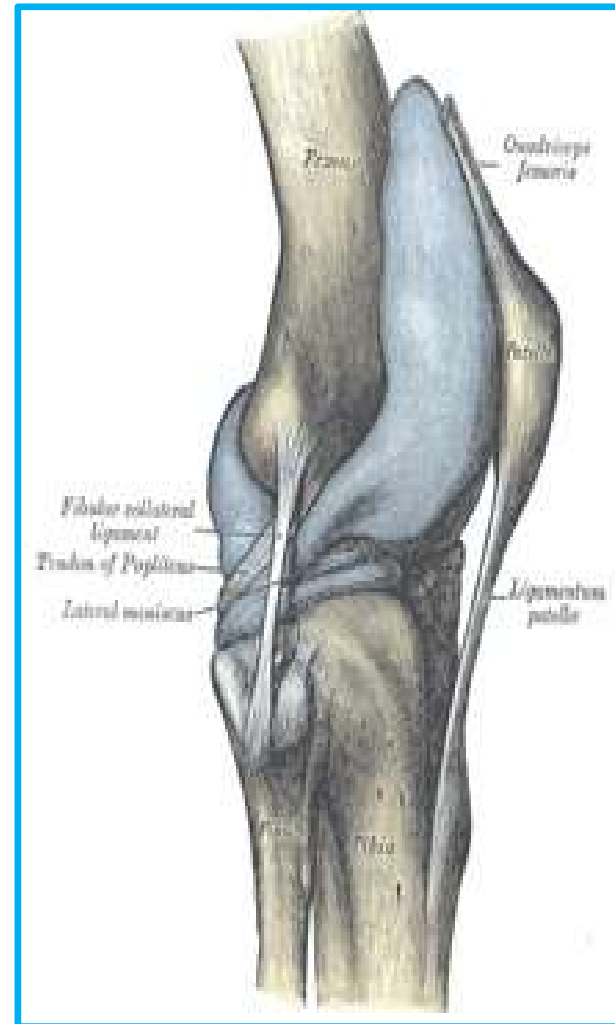


## Lab Exercise #2

- Appreciate the texture of your partners back, identify areas of the paraspinal regions that are:
  - Warm vs. Cool (dorsum of hand)
  - Moist vs. Dry (light, surface skin drag)
  - Boggy vs. Firm (region between dermis and musculature)
  - Ropey vs. Hypotonic vs. Hypertonic (deeper palpation into musculature)
  - Red Reflex – present vs absent (deeper skin drag)
- When possible, simultaneously compare left vs right using the pads of digits 2-4

# Motion Restriction: Barrier “end feel” characteristics

- Bony: Hard
- Tendinous: Elastic
- Ligamentous: Firm and abrupt
- Soft tissue: Soft
- Guarding: Empty
  - Patient voluntarily limits the motion secondary to pain



## Lab Exercise #3: expected barrier end feel

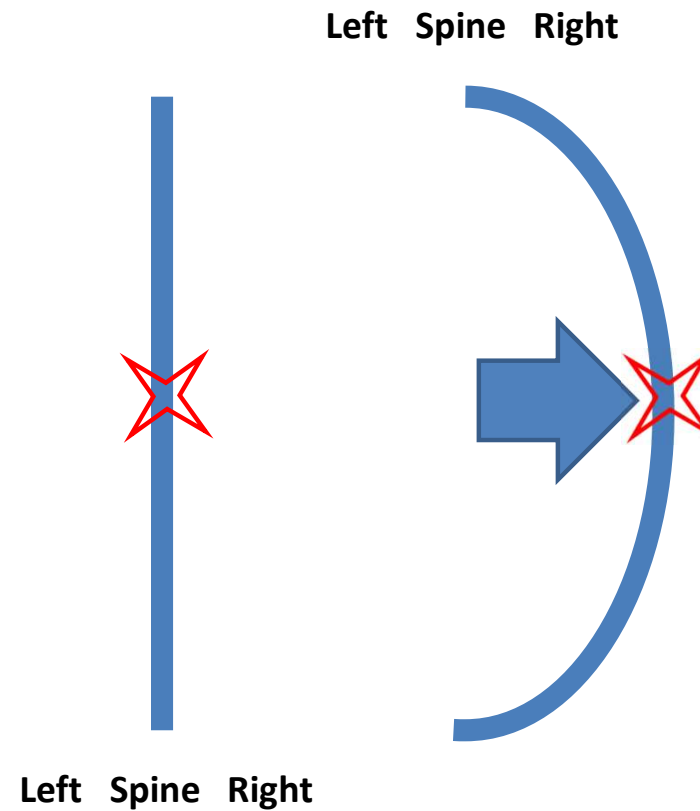
- **Soft Tissue Barrier**
  - Elbow flexion
  - Knee flexion
  - Hip flexion (?)
- **Boney Barrier**
  - Elbow extension
- **Guarding/Empty Barrier**
  - Be creative
- **Tendinous Barrier**
  - Wrist flexion/extension
  - Ankle dorsiflexion/plantar flexion
  - Elbow flexion coupled with shoulder flexion
- **Ligamentous Barrier**
  - Ankle plantar flexion
  - Knee extension
  - Drawer testing of knee and ankle

## Side bending and Translation

- Translation is motion of a body part along an axis.
- Left translation and right translation in the context of positioning a patient's spine refer to movement along an axis that is transverse to the spine
  - Left translation of a vertebral segment will induce right side bending of the spine at the level where the translation is introduced
  - Right translation of a vertebral segment will induce left side bending of the spine at the level where the translation is introduced

# Side bending and Translation

- **At the level of the somatic dysfunction:**
  - Right translation = left sidebending
  - Concave left = left sidebending
  - Convex right = left sidebending



# Extension and Anterior Translation

- Translation is motion of a body part along an axis.
- Anterior translation in the context of positioning a patient's spine refer to movement along a posterior to anterior axis.
- Anterior translation of a vertebral segment will induce extension of the spine at the level where the translation is introduced.

# Flexion and Posterior Translation

- Translation is motion of a body part along an axis.
- Posterior translation in the context of positioning a patient's spine refer to movement along an anterior to posterior axis.
- Posterior translation of a vertebral segment will induce flexion of the spine at the level where the translation is introduced.

## Lab Exercise #4

- Have patient seated on the exam table, physician standing behind and then to the side.
- Ask the patient to sidebend to each side and observe translation to the opposite side, of the middle vertebral segment in the curve.
- Ask the patient to flex the spine and observe posterior translation of the middle vertebral segment in the curve.
- Ask the patient to extend the spine and observe anterior translation of the middle vertebral segment in the curve.

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All grievances should be in writing and should specify the nature of the grievance. Initially, all grievances should be directed to MAOPS Executive Director, who will then forward said grievance to the Education & Convention Committee. All grievances will receive an initial response in writing within 30 days of receipt. If the participant does not receive a satisfactory response, then they can then submit a complaint in writing to the Bureau of Osteopathic Education of the AOA at 142 East Ontario Street, Chicago, IL 60611.