Introduction To The Clinical Application Of Functional Pathology Of The Musculoskeletal System (FPMSS)

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Disclosure

- This Lecture is based on Dr. William Brook's lifetime of accumulated intellectual knowledge as well as my personal clinical approaches to FPMSS
- Dr. Brooks has been a mentor to me for the past 25 years
- I Served as a table trainer in his most recent Seminar in Tucson Arizona in August and September of this year

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Dr M. Shane Patterson is a Board Certified Internist and is fellowship trained in OMT. Since 2003 he has been providing comprehensive primary care including MS pain management utilizing OMM based on the FPMSS paradigm at Osteopathic Health Care Associates which he is founder and CEO. His patient population includes patients with multi-regional, chronic, tertiary musculoskeletal pain syndromes including headache, Long COVID, post concussive syndrome and other acute and chronic pain symptoms. He regularly mentors Henry Fords' Osteopathic Medical Students and Residents in OMM.

Doctor of Osteopathy, Kansas City University College of Osteopathic Medicine, Kansas City, MO 1998; Osteopathic Principles and Practice Fellowship 1997-1998

Internship, Bi-County Community Hospital/Henry Ford Hospitals, Warren MI 1998-1999

Family Medicine, Saint John West Shore Hospital, Westlake, OH 1999-2000

Internal Medicine, Bi-County Community Hospital/Henry Ford Hospitals, Warren MI 2000-2002; American Osteopathic Board of Internal Medicine, Board Certified 2008

Introduction to FPMSS

Functional Pathology
of the
MusculoSkeletal System

TAKE AWAY

- PAIN IS A PERCEPTION
- MS SYSTEM IS AN ORGAN SYSTEM WHICH IS INTEGRATED WITH ALL OTHER SYSTEMS IN THE BODY
- DIAGNOSTICS ARE PARAMOUNT
- PATHOLOGY AND DYSFUNCTION ARE OFTEN DIFFERENT ENTITIES
- CHECK THE WHOLE SYSTEM NO MATTER WHERE THE PATIENT SAYS THE PAIN IS LOCATED… THE PATIENT IS THE ONLY ONE WHO CAN RELATE THEIR PAIN, BUT RARELY CORRECT ABOUT WHERE THE PROBLEM IS LOCATED

What is FPMSS?

FPMSS is a

DIAGNOSTIC

paradigm that aims to set out a scientifically valid concept for identification, naming, and evaluation of dysfunctional motion patterns throughout the entire Musculoskeletal System

Goals of FPMSS

- DIAGNOSIS is the key! (Diagnostics and treatment are separated)
- Improve efficiency and accuracy of MS diagnostics
- Improve scientific construct validity including intra and inter examiner reliability
  - Preliminary studies show high degree of agreement (Dr. Yee UC Davis)
- Improve objectivity / accuracy of documentation and student testing
  - Reimbursement, Insurance documentation, IME / disability
- Improve communication between professionals
  - Standardized exam is consistent with other specialties (PT, Ortho, Cardiology)
- Accurately identify dysfunctional motion patterns
- Provide improved rationale for why patients have chronic pain
  - Reassures pt they have a reason for pain and increases pt confidence in physicians
- Diminish risk of complications from ionizing radiation, medications, injections, surgical procedures, hospitalizations, and biochemical testing

What does Functional Pathology mean?

Malfunction for which no singular Somatic Dysfunction or pathologic condition can be discerned as specific to the MusculoSkeletal System (MSS)

The subjective pain is the reason the patient presents, but the treatment is accomplished by defining objective motion restrictions across the entire MSS

Primary benefits of FPMSS to the clinician

Because this exam is standardized, reproducible and quantifiable, it has great utility in several respects:

1. It provides guidance as to the appropriateness of further MSS treatment
   - which is warranted as long as objective improvement in function coincides with improved pain reduction.

2. Demonstrates whether comprehensively restoring function is insufficient for pain control, thus providing rational for further investigation into possible structural pathology

3. Provides objective evidence for recommendations to, and opinions for, third parties such as insurers, attorneys, employers, and family.

Why is FPMSS necessary for research, training, teaching OMT?

Learning OMT in the “old days”

1. Treats the musculoskeletal system (MSS) as an INTEGRATED organ system
2. Describes how the FUNCTION of the parts of the MSS support both the motion of the organism and its ability to move objects
3. Clearly identifies dysfunctional MOTION patterns within the body
4. Identifies and Measures available motion rather than static posture
5. Uses PROPORTIONALITY to find, prioritize, and profile available motion deficits, which provides a HIGHLY RELIABLE scientific basis for the order of treatments
6. Provides a clear definition of what is being measured and how those data can be utilized it is measured supports HIGHLY RELIABLE results, as examiners use the same terminology for all positions, measure the same orientation of axes and use the same grading scale

- Add numbers and separate

- The emphasis of diagnostics needs to be on **function** and **mobility**
- NOT the location of pain

Restorative Care

- Restorative care of a musculoskeletal pain complaint restores functional capacity to the **entire** MSS.
- It doesn’t matter whether there is reversible or irreversible structural pathology as the proximate cause of the pain.
- In contrast to maintenance care, restorative care is characterized by finding and eliminating the source(s) of the persistent malfunction.

Primary features of FPMSS

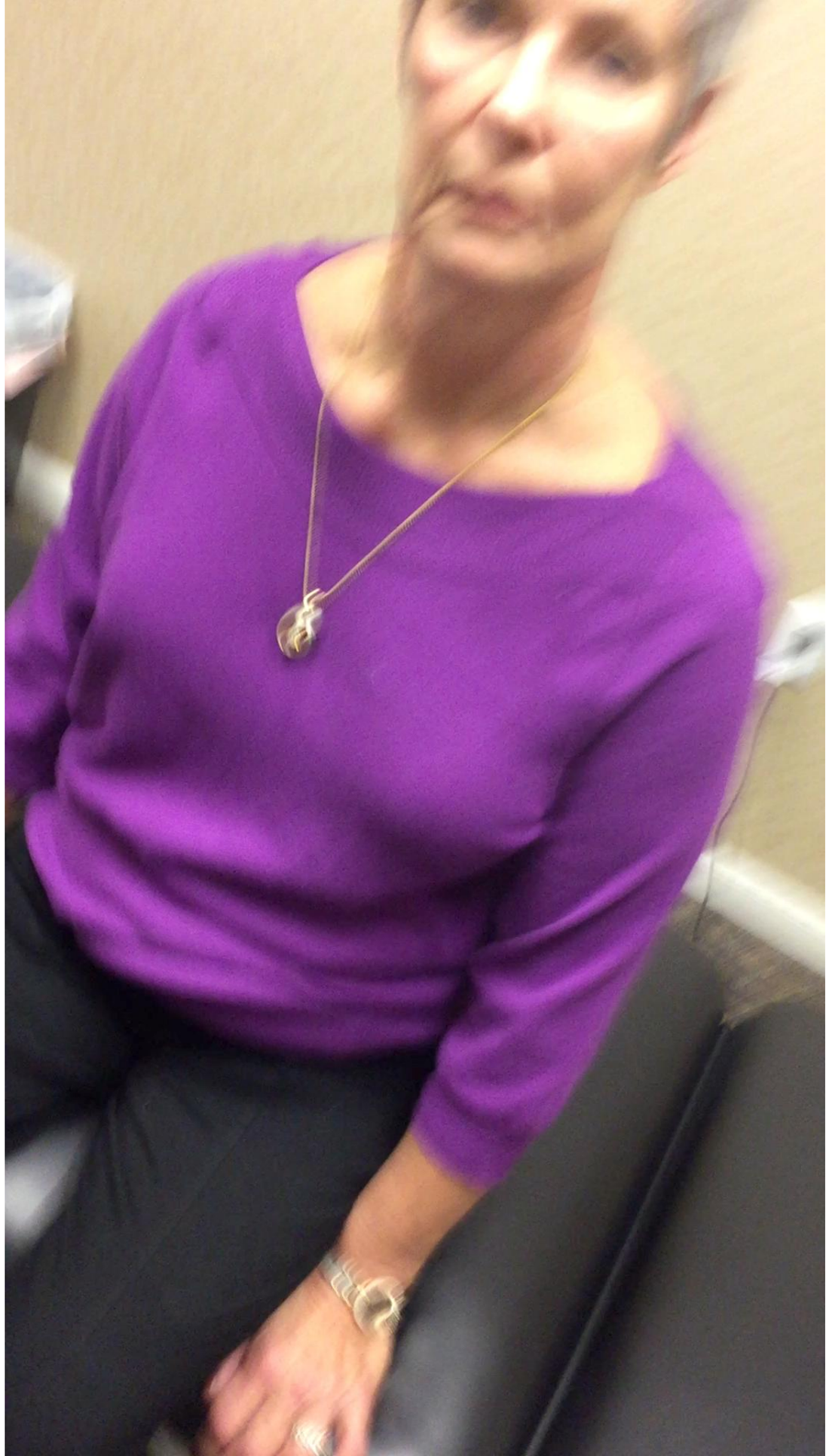
- Provides an Integrated Concept of MSS DIAGNOSIS and Treatment
  - Treats the MSS as a cohesive system and NOT isolated static structures
  - Standardizes the exam and makes it independent from the treatment modality
  - Movement-Centric Assessment
    - Shifts the focus to whole body dynamic movement analysis and away from antiquated structural-postural and alignment concepts
  - Motion profiling
    - Introduces the concept of documentable motion patterns which enables personalized biomechanical treatment strategies

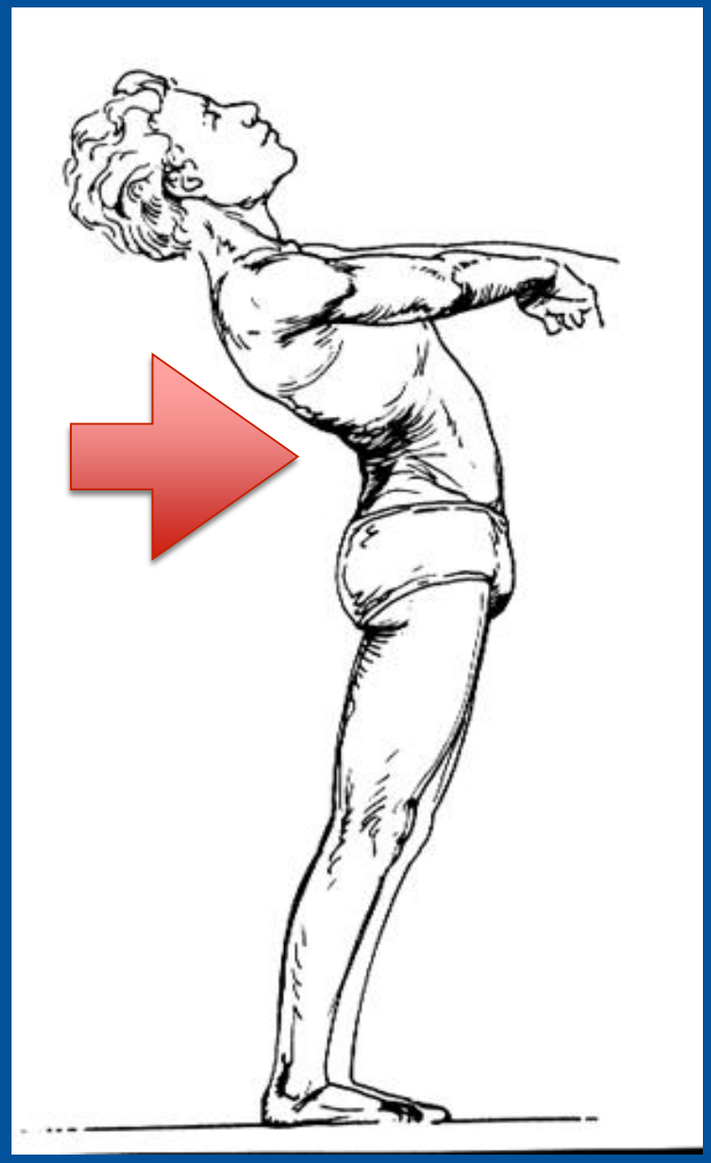
Why do we need a different approach?

- Lack of docs performing and getting paid for OMT
- To provide unity to teaching, testing, and certifying OMT practitioners
- Applicable and reproducible research to support clinical assessment and payments
- There needs be a consistent sequence for successfully treating chronic pain complaints
- Too reliant on authority for diagnostic rationale (too much variation on how diagnoses are made) ????
- DO’s should be LEADING!!!

- Observation of the static posture will commonly miss functional ROM losses in different planes of motion
- The body is made to move and will compensate in different ways to achieve movement


So Thats W
NEGATIVE 4
NEGATIVE 1
NEGATIVE 1
REFERENCE RANGE
-EXCELLENT!





Applying FPMSS in the clinical setting

Formulate a treatment plan for restoring proportionate available motion of the whole MSS based on three stages of interpretation:

1. Grading
2. Profiling
3. Prioritizing

Begin with the initial exam:

1. GRADING

- First find the % loss of ROM at specified joint being examined:
  - Grading Excursion (GE)
- Starting point for PROM evaluation of examined joint
  - Grading Position (GP)

< GP	Likely structural pathology	
-4	75% to 95%	Loss of GE
-3	50% to 74%	Loss of GE
-2	25% to 49%	Loss of GE
-1	5% to 24%	Loss of GE
RP	100% +/- 5%	Loss of GE
+1	+105% to +125%	Exceeding GE
+2	+126% to +150%	Exceeding GE

Proportionality is how Grading is Documented

Relation of a specific movement pattern to all movements of a system in balance one with another.

Reduces reliance on Symmetry by comparing motions within the body to an established ideal reference number (expected ROM)

- Add pict

SEATED:
GROSS POSTURE: *-2 ROM -50% THORACIC REGION, TENSE, BILATERALLY, LUMBAR REGION, TENSE, BILATERALLY*
SEATED TWIST LEFT: *-1 ROM -25%*
SEAT TWIST RIGHT: *-1 ROM -25%*
KNEES: -
ROTATION RIGHT: *-2 ROM -50%*
ROTATION LEFT: *-2 ROM -50%*
FEET: -
DORSI FLEX LEFT: *-2 ROM -50%*
PLANTAR FLEX LEFT: *-1 ROM -25%*
MID LEFT: *-2 ROM -50%*
DORSI FLEX RIGHT: *-2 ROM -50%*
PLANTAR FLEX RIGHT *-1 ROM -25%*
MID RIGHT *-2 ROM -50%*
ANKLES: -
EVERSION LEFT: *-2 ROM -50%*
INVERSION LEFT: *-1 ROM -25%*
EVERSION RIGHT *-2 ROM -50%*
INVERSION RIGHT *-1 ROM -25%*

SUPINE:
KNEES: -
LAT GLIDE LEFT: *-1 ROM -25%*
LAT GUIDE RIGHT: *-1 ROM -25%*
BACK BENDING LEFT: *-2 ROM -50%*
BACK BENDING RIGHT: *-2 ROM -50%*
HIPS: -
KNEE-CHEST LEFT: *-2 ROM -50%*
KNEE- CHEST RIGHT: *-2 ROM -50%*
EXT ROT LEFT: *-1 ROM -25%*
EXT ROT RIGHT: *-1 ROM -25%*
INT ROT LEFT: *-2 ROM -50%*
INT ROT RIGHT: *-2 ROM -50%*

SUPINE:
KNEES: -
LAT GLIDE LEFT: *-1 ROM -25%*
LAT GUIDE RIGHT: *-1 ROM -25%*
BACK BENDING LEFT: *-2 ROM -50%*
BACK BENDING RIGHT: *-2 ROM -50%*
HIPS: -
KNEE-CHEST LEFT: *-2 ROM -50%*
KNEE- CHEST RIGHT: *-2 ROM -50%*
EXT ROT LEFT: *-1 ROM -25%*
EXT ROT RIGHT: *-1 ROM -25%*
INT ROT LEFT: *-2 ROM -50%*
INT ROT RIGHT: *-2 ROM -50%*
ADDUCT LEFT: *-2 ROM -50%*
ADDUCT RIGHT: *-2 ROM -50%*
ABDUCT LEFT: *-1 ROM -25%*
ABDUCT RIGHT: *-1 ROM -25%*

PRONE:
NEUTRAL: -
THORAX PSM: *TIGHT LT RT*
LUMB PSM: *TIGHT LT RT*
SACRUM *-3 ROM -75%*
BACK BENDING: -
THORAX *-2 ROM -50%*
LUMBAR: *-2 ROM -50%*
SACRUM: *-2 ROM -50%*
SCAP RIGHT *-2 ROM -50%*
SCAP LEFT: *-2 ROM -50%*

BACK BEND:
HIPS LEFT: *-2 ROM -50%*
HIPS RIGHT *-2 ROM -50%*

2. **Profiling**

What is ideal available motion for a unique individual?

Wide variation of “healthy” available motion between individuals (Common vs tight vs loose physiology)

Teenage gymnast vs 60 yo couch potato

3. **Prioritizing**

What are the most severe restrictions of available motion?

Goals

Optimization of function for that individual


LAR SYSTEM
TH
S. Patterson
ERNAL MEDICINE D.M.D.
OSTEO
D
HEALTH CEN


MUSCULAR SYSTEM
THE SKELET
OSTEOPATHIC
D O
HEALTH CENTER

So Thats What Those Numbers Mean

NEGATIVE 4 Loss of > 90% ROM

-No significant motion at that joint

NEGATIVE 3 Loss of between 65 and 90% ROM

-Minimal motion at that joint

NEGATIVE 2 Loss of between 40 and 65% ROM

-Getting better! You have about half of ideal motion

NEGATIVE 1 Loss of between 15 and 40% ROM

-This is good! You have most of the ideal motion

REFERENCE RANGE Less Than 15% Loss of ROM

-EXCELLENT! You are nearly perfect

Not everyone will have perfect Range Of Motion throughout their bodies, and that's OK. Some damage to joints, either traumatic or arthritic, will result in permanent loss of moti

YOUR GOAL: Optimize YOUR body's movement patterns and maintain them as close to ideal, for YOU, as possible. This will reduce or eliminate pain, reduce injuries and impr

There are multiple ways to optimize your physical function and we at OHCA always do our best to find the solution that works best for you.

OHCA is here to help you achieve your Health and wellness goals!

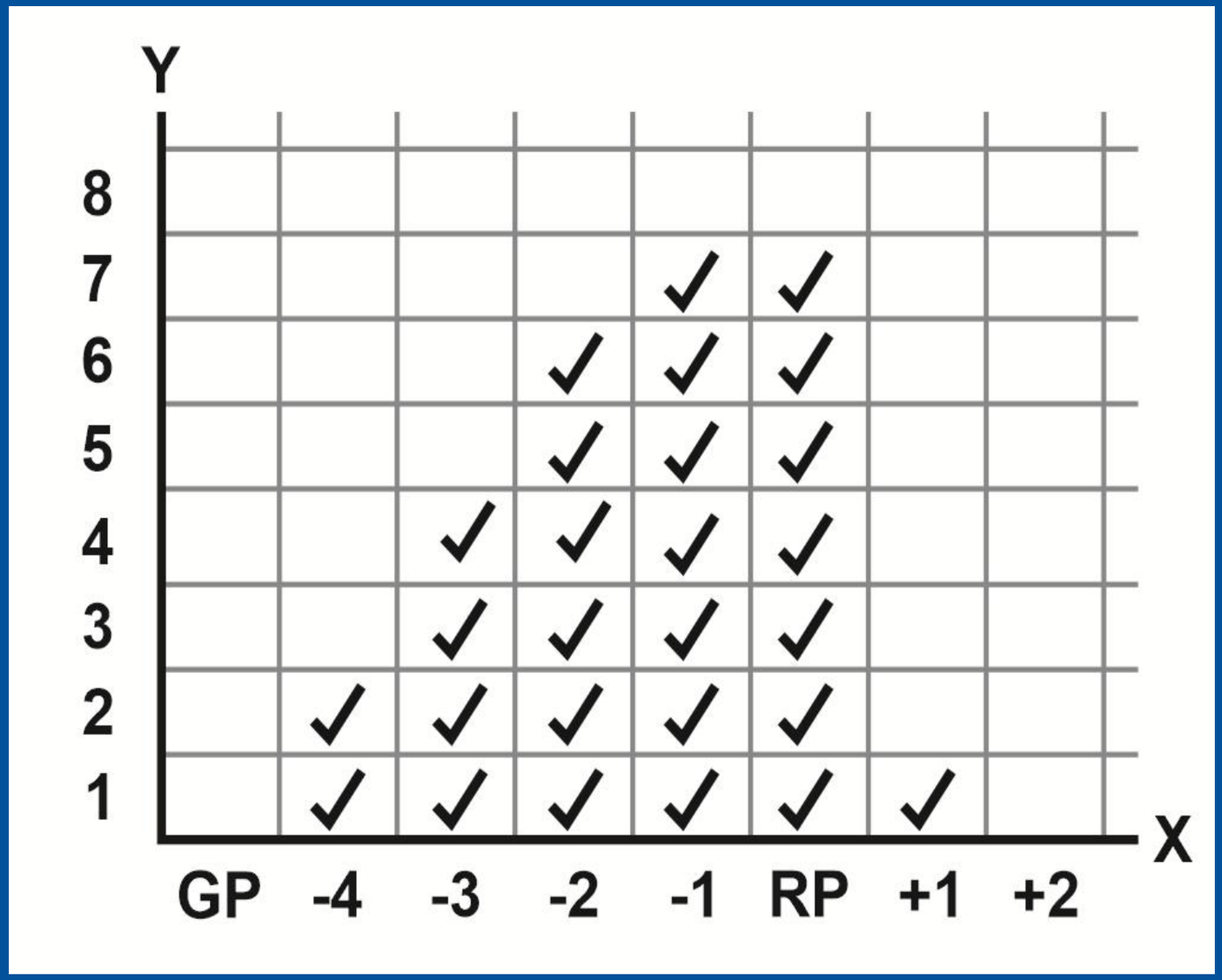
3. Prioritizing

- What are the most severe restrictions of available motion?
- The Goal is to optimize function for that individual

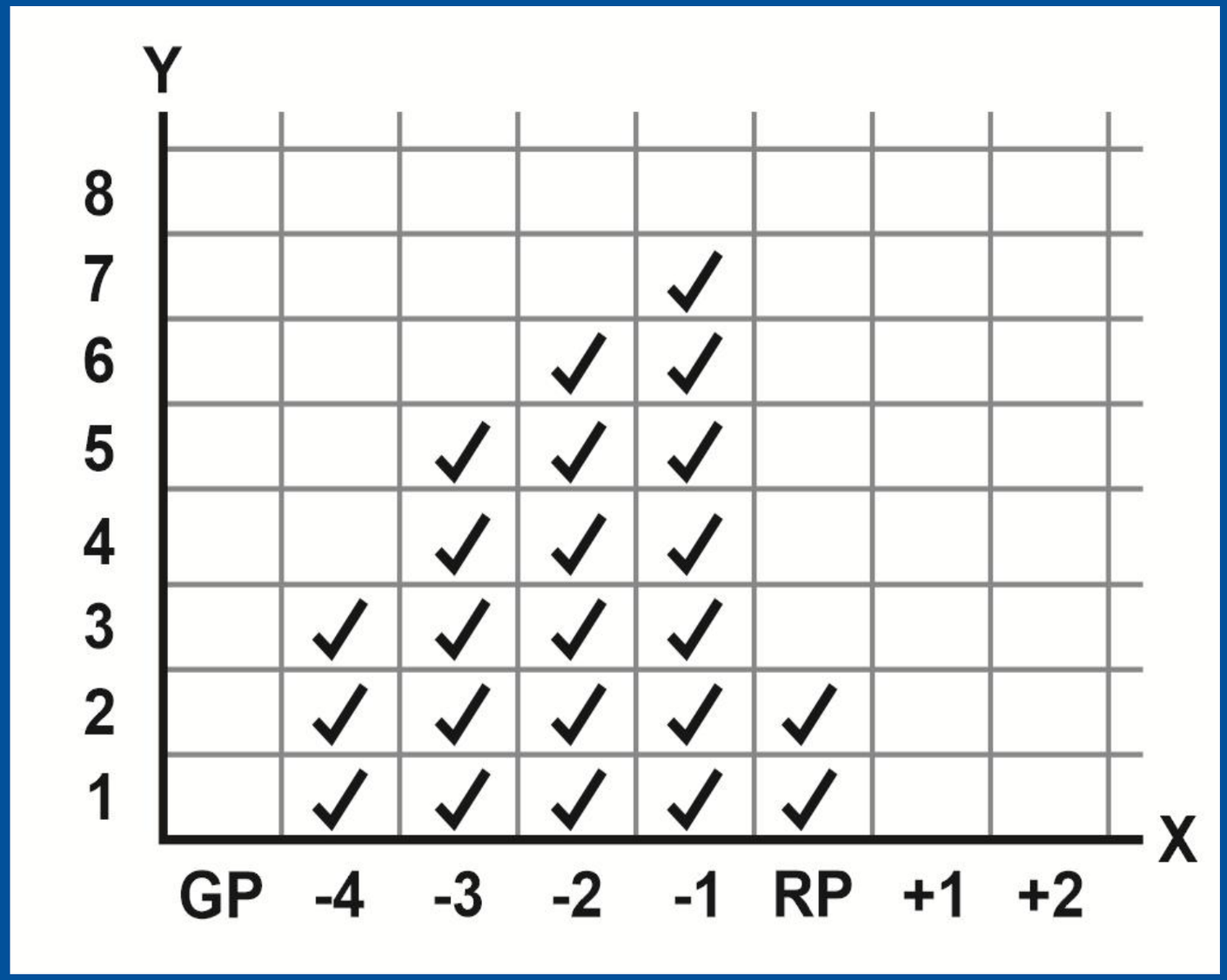
- Treat Largest motion deficit furthest from the pain

- First Supine: ankle moving toward hip
- Next Prone: hip then lumbar then thoracic

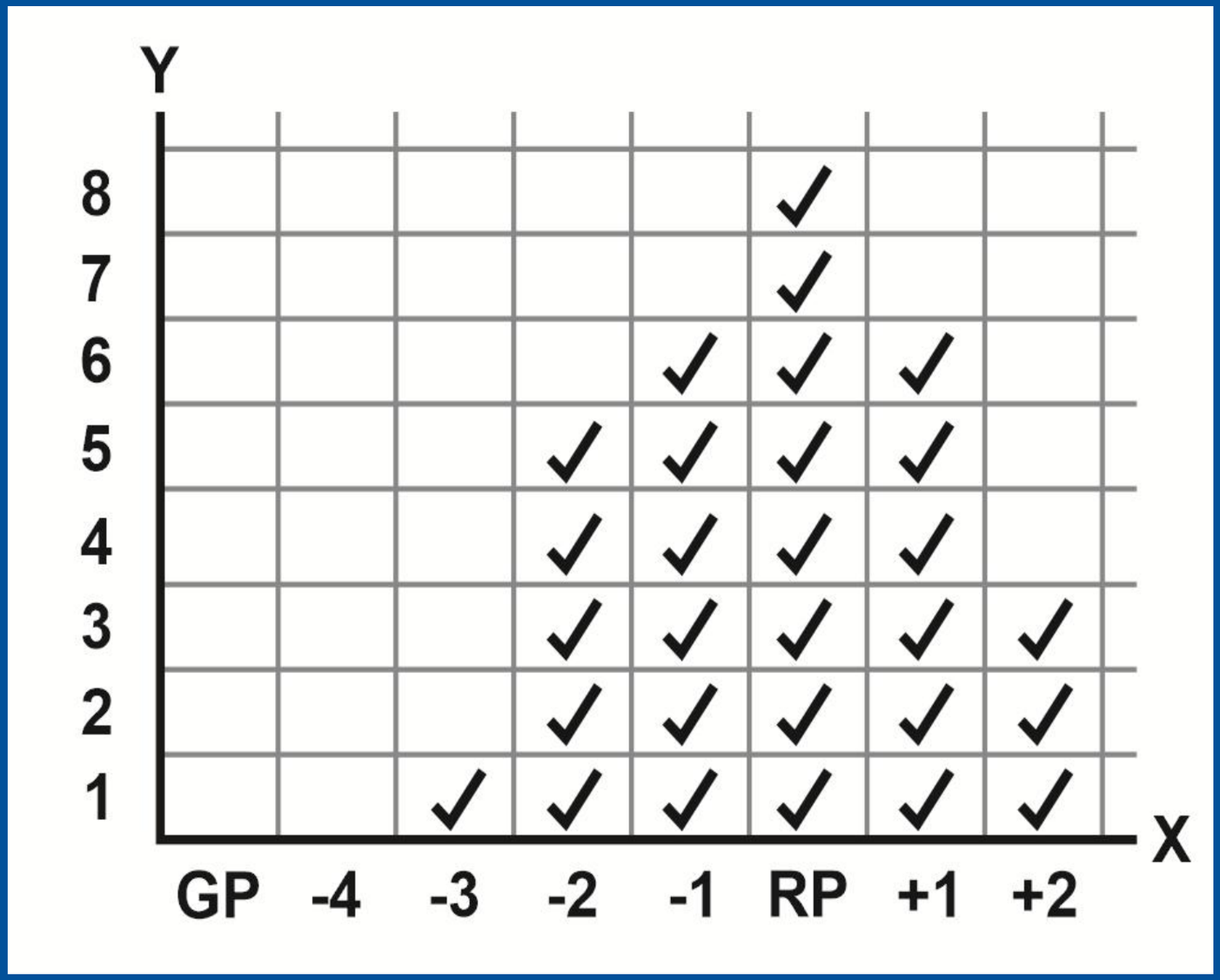
Profiling: “Common”



Profiling: “Tight”

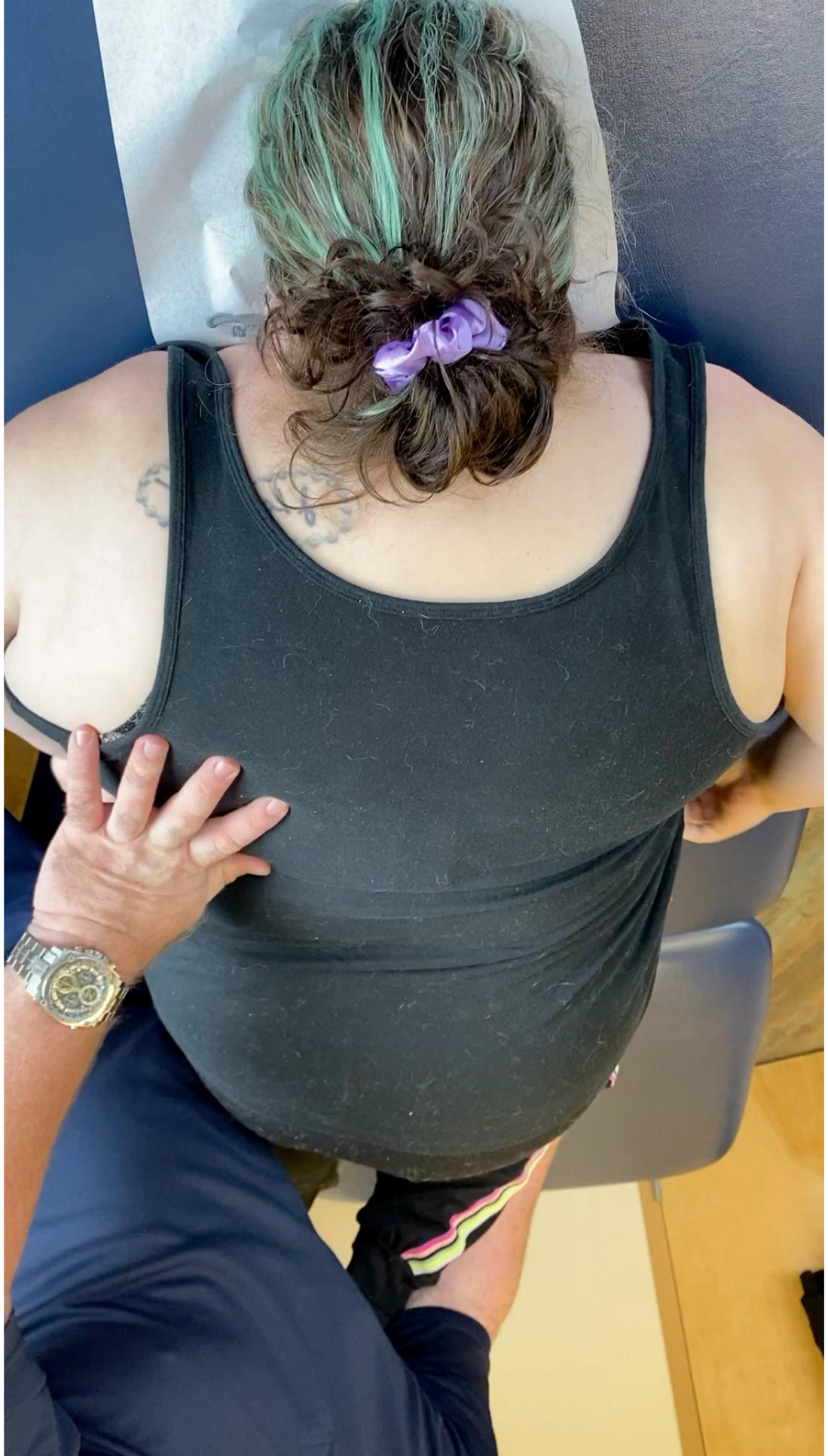


Profiling: “Loose” (Hypermobility Syndromes)



Principals of Passive Motion evaluation

- Confine evaluation to specified joint or joints - **Stop the linkage**
  - How the operators movement of a specific area affects passive motion in other parts of the system
    - Improves exam reproducibility, accuracy, reliability
- Passive motion assessments for available motion
- Define the positional context in which you examine the patient
  - Supine, prone, seated, etc
- Smaller joint movements are more difficult to assess than larger movements



Exam:

- Seated: Scap, thoracic, lumb, ribs, whole body rotation
- Supine: Hips, knees, feet, abdomen
- Prone: Hips, sacrum, lumb, thoracic, ribs

Clinical Application: chronic MSS pain syndromes

- To “stabilize” or to ”mobilize”? . . . “that is the question!”
- Mechanisms of chronic / recurrent biomechanical pain
- Maintenance vs restorative care
- General principles of restorative care
  - First Restore motion
  - Next establish NMI L
  - Lastly, Strengthen specific muscles
- Assumptions of FPMSS: That restoration of proportional motion throughout the body will reduce the perception of pain

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A Treatise on the Functional Pathology of the Musculoskeletal System — Introduction: a unifying scientific paradigm for manual medicine 2022

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Critique and Revision of Historical Definition of Somatic Dysfunction

The AACOM Glossary of Osteopathic Terminology defines somatic dysfunction as:

Impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodial and myofascial structures, and their related vascular, lymphatic, and neural elements. Somatic dysfunction is treatable using osteopathic manipulative treatment. The positional and motion aspects of somatic dysfunction are best described using at least one of three parameters:

1. The position of a body part as determined by palpation and referenced to its adjacent defined structure,
2. The directions in which motion is freer, and
3. The directions in which motion is restricted.1

Proposed FPMSS definition of Somatic Dysfunction:

“**somatic dysfunction. Inefficient function** (posture and movement) of the musculoskeletal system and related vascular, lymphatic and neural systems. It is characterized by disproportionately restricted range of available mobility and motility in relation to proportionate whole system potential motion and further characterized as distorted posture resulting from disproportionate motion. It is treatable utilizing OMT or any number of other modalities.

FPMSS VS Postural Structural Diagnostic Model

- Motion loss cannot be validly inferred from positional changes
- Active motion testing cannot validly evaluate the potential ROM
  - Testing is primarily passive motion assessment which removes the confounding variables of active motion compensations
- Motion loss in one direction cannot be validly inferred from motion changes in other directions

FPMSS VS Postural Structural Diagnostic Model

- Physiology cannot be validly inferred from anatomy
  - Function can NOT be understood by merely understanding structure
    - MOTION, not structure or posture, is what is being measured and used to determine areas of dysfunction

- Functional pathology cannot be validly inferred from physiology
  - Malfunction can NOT be understood by merely understanding function