

RENEWED
PERFORMANCE



Assessing and Optimizing Functional Movement

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Outline



WHAT IS PAIN



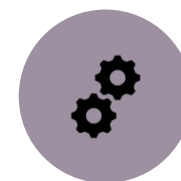
PATIENT FIRST CARE



KEYS TO OPTIMIZING
MOVEMENT



HOW TO ASSESS
FUNCTIONAL
MOVEMENT



HOW TO OPTIMIZE
FUNCTIONAL
MOVEMENT



UNDERSTANDING AND
MANAGING GOOD
VERSE BAD STIFFNESS

What Is Pain???



What is Pain?

- Pain is a multiple system output, activated by the brain, which is activated by perceived threat.
- (Butler & Moseley, 2003; Moseley, 2003b).



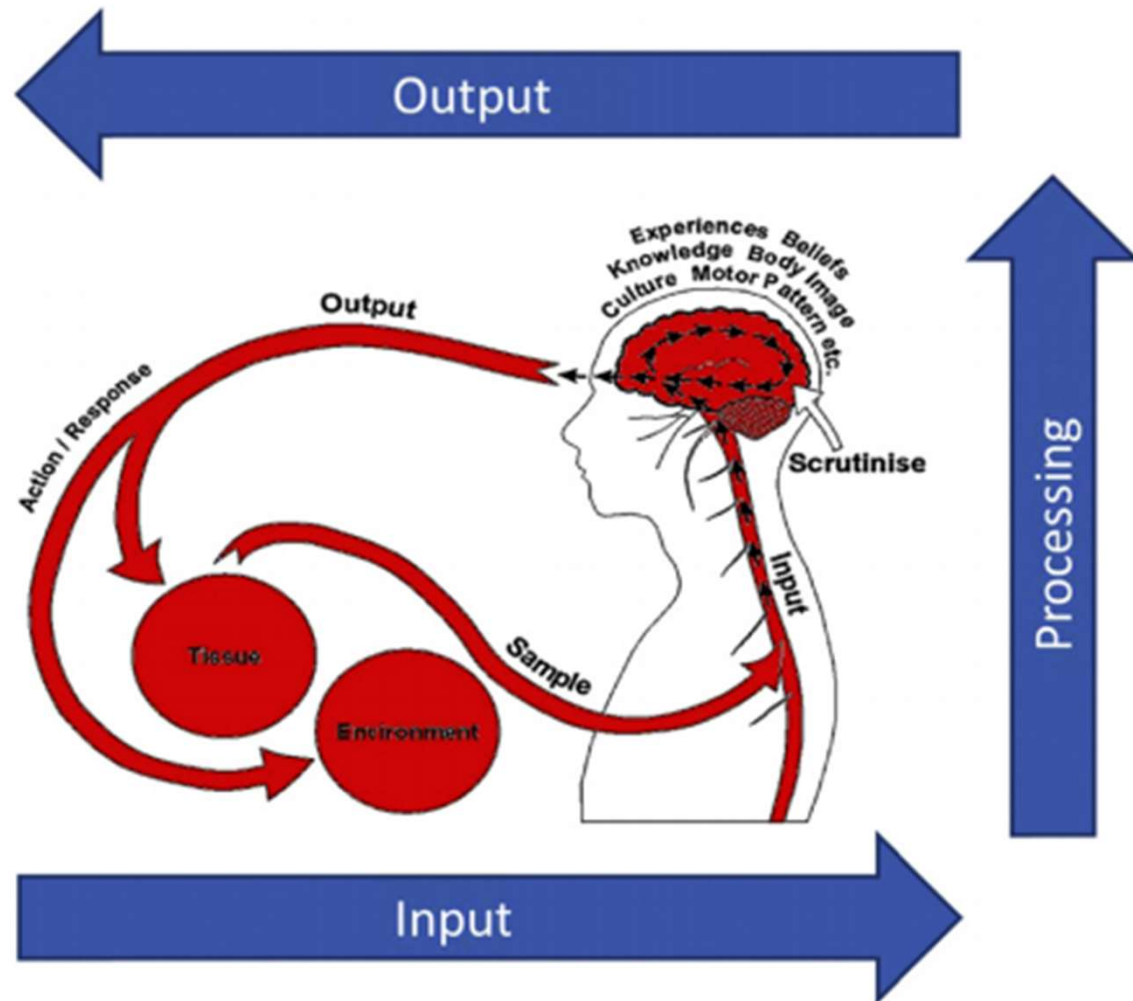
- **If problems do exist in joints, muscle, tendons, nerves, immune system, etc. It will not hurt if your brain thinks you are not in danger.**
- **In the same way, if no problems exist in your body tissues, immune system, etc, it will still hurt if your brain thinks you are in danger.**

Most Common

- Pain occurs when your body's alarm system alerts the brain to actual or potential tissue damage.
- Pain involves all of your body systems, and all of these responses are for protection and healing.



How is pain processed?



Acute & Chronic Pain



Chronic Pain

- The longer pain persists however, the nervous system is less likely to decrease its sensitivity and may even increase its sensitivity. (Cook, Woolf, Wall, & McMahon, 1987; Woolf, 1994; Woolf & Doubell, 1994).
- Clinically, these patients will have heightened responses to stimuli, including palpation of the peripheral nervous system (Walsh & Hall, 2009b) and active and passive neurodynamic tests such as straight leg raise (SLR) and slump. (Boyd, Wanek, Gray, & Topp, 2009; Coppieters, Alshami, Babri, et al., 2006; Coppieters, Alshami, & Hodges, 2006; Walsh & Hall, 2009a)



Central Sensitization

- In processing dominant systems (central sensitization), the spinal cord, brain stem and cerebral hemispheres become the source of dysfunction, with or without peripheral input. (Nijs, Van Houdenhove, & Oostendorp, 2010; Woolf, 2007).
- CNS, due to persistent input (particularly via **C-fibers**) increases its sensitivity over time. In many cases, the original injury may have healed.
- Pain is also now heavily affected by thoughts, feelings and emotions.



Cognitions, thoughts and beliefs drive pain





How Are People Coping With Pain?

99% of the worlds Hydrocodone is consumed in the United States

100 billion Aspirin tablets are consumed per year

*** That is 40,000 tons***



**85% of the things we worry
about NEVER happen**



**The fear of pain is
worse than the pain
itself.**

-Gordon Wadel



What Pain is Not:

- Assumption that there is a direct link between the amount of tissue damage and the level of pain experienced
- All pain is caused by injury, and increased pain means more damage.
- In chronic pain, tissues are not healing, and damage is ongoing.
- Nociception and pain are synonymous.
- Pain is an input-driven system.



Community Education

- Focus:
 - Health of our community
 - ✓ Physical activity guidelines
 - ✓ Nutrition
 - ✓ Sleep
 - ✓ Available resources



Medical Thinking

Mistakes

- Too much emphasis on the body/biology
- Negate importance of fear, rage, neglect, attachment
- If it can't be explained at a cellular level then we ignore it
- Our thoughts influence our care
 - What are your blind spots?





YOUR WORDS MATTER!
89% OF PEOPLE WITH PERSISTENT
LOW BACK PAIN REPORT THEIR
NEGATIVE BELIEFS WERE LEARNED
FROM HEALTH PROFESSIONALS

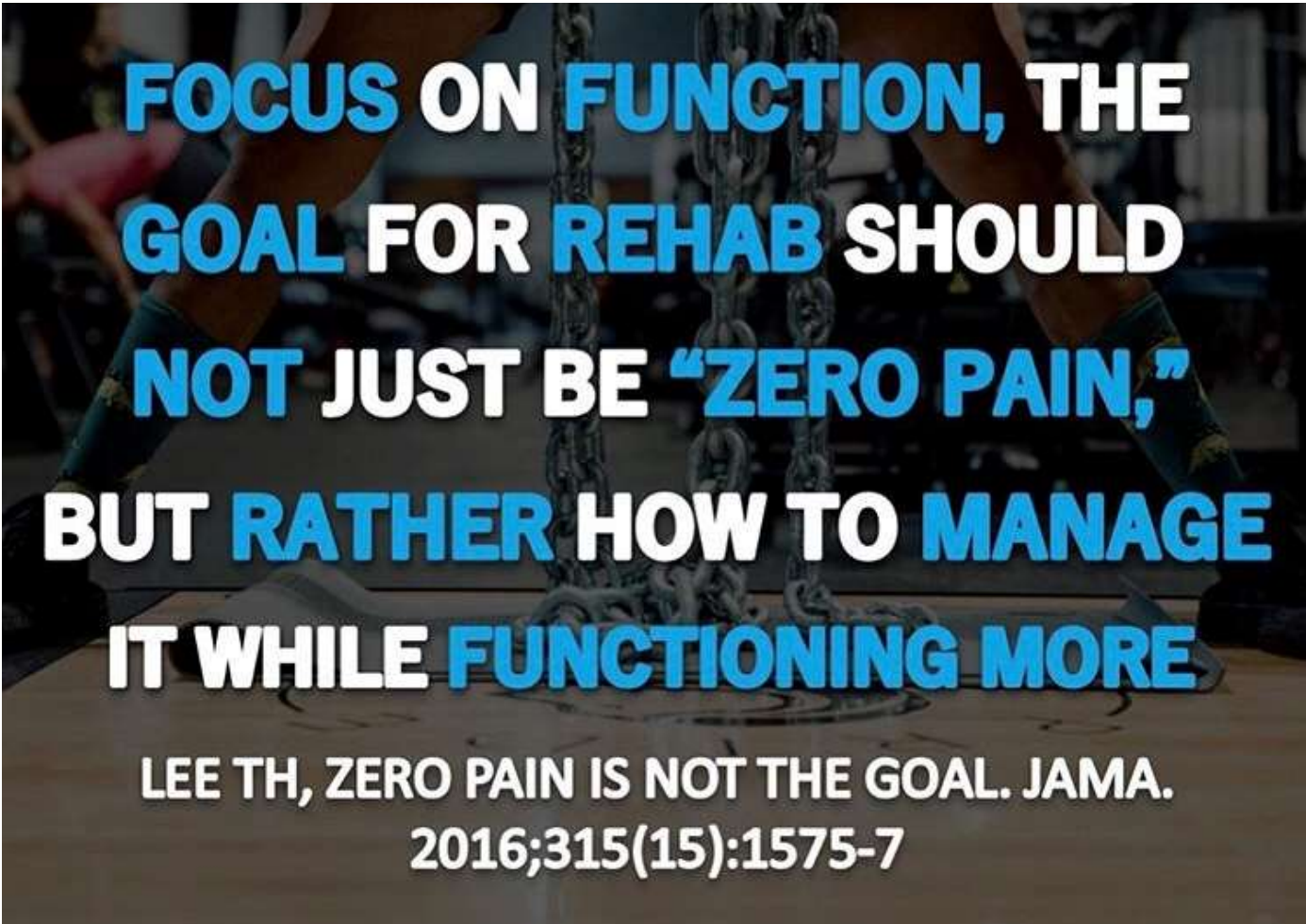
SETCHELL J, COSTA N, FERREIRA M, MAKOVEY J, NIELSEN M, HODGES PW. INDIVIDUALS' EXPLANATIONS FOR THEIR PERSISTENT OR RECURRENT LOW BACK PAIN: A CROSS-SECTIONAL SURVEY. BMC MUSCULOSKELET DISORD. 2017;18(1):466.

**Treat the person NOT the
diagnosis or pathology**



NOW: How Do We Optimize Movement?!





**FOCUS ON FUNCTION, THE
GOAL FOR REHAB SHOULD
NOT JUST BE “ZERO PAIN,”
BUT RATHER HOW TO MANAGE
IT WHILE FUNCTIONING MORE**

LEE TH, ZERO PAIN IS NOT THE GOAL. JAMA.
2016;315(15):1575-7

Keys to optimizing movement

- We need to understand how the body moves and why the body moves in order to optimize function.
- Many times, we are **UNSUCCESSFUL** with our rehabilitation programs or training programs because we do not understand the basics of optimizing movement patterns.
- Function may be household activities or pitching in the major leagues.



- In order to function properly our joints need to be mobile, but control and stabilization of this mobility is often less than optimal.
- Unfortunately, mobility prior to performing stabilization is often overlooked in the design of rehabilitation and performance programs.
- **Traditional program design relies too much on stretching what is tight and strengthening what is weak. We are missing the boat which is causing less than optimal outcomes.**





- It begins with the simple understanding of how the human body works most efficiently and integrates those concepts into rehabilitation and performance training.
- Optimizing functional movement is based on functional anatomy and biomechanics, not simplistic anatomy. It is a combination of functional assessment, mobility, strengthening, corrective exercise, manual techniques, dynamic stabilization, and neuromuscular control.

The Body Is AMAZING!!!

- The body can do extreme movements repetitively and is resilient to those stressors
- Adapts based on the function that the person needs or wants to achieve
 - Hypertrophy, strength, mobility

HOWEVER

- The body always takes the path of least resistance
- Great at compensating



Relative Stiffness and Relative Flexibility

- Shirley Sarhmann
 - One area that has more mobility is going to compensate for an area that has more stiffness.
- Janda
 - Motor control dysfunction



The best is not always the most efficient way

- The body is most efficient with **energy** but not movement patterns.
 - Great at going from A → B
- Poor movement patterns due to that pattern being the most efficient.
IT'S EASY



**Every “body” tell us a story. Let the body speak to
you.”
- Vladimir Janda**



What Do You See?



Baseball Player Vs. Swimmer

- Baseball: Scapular depression, but what else do you see?
- Swimmer: Scapular Elevation, but what else do you see?



Three Huge Take Aways

1. This is yet another reminder that you can't just have a "rotator cuff program." Both of these guys could present with the same pathology, but with completely different underlying movement diagnoses.
2. The same exercises might need to be coached differently for two different athletes
3. whenever you see tightness, before you stretch it, ask why it's there. With the pitcher in scapular depression, it's a protective tension you don't want to just stretch out. The swimmer could actually benefit.

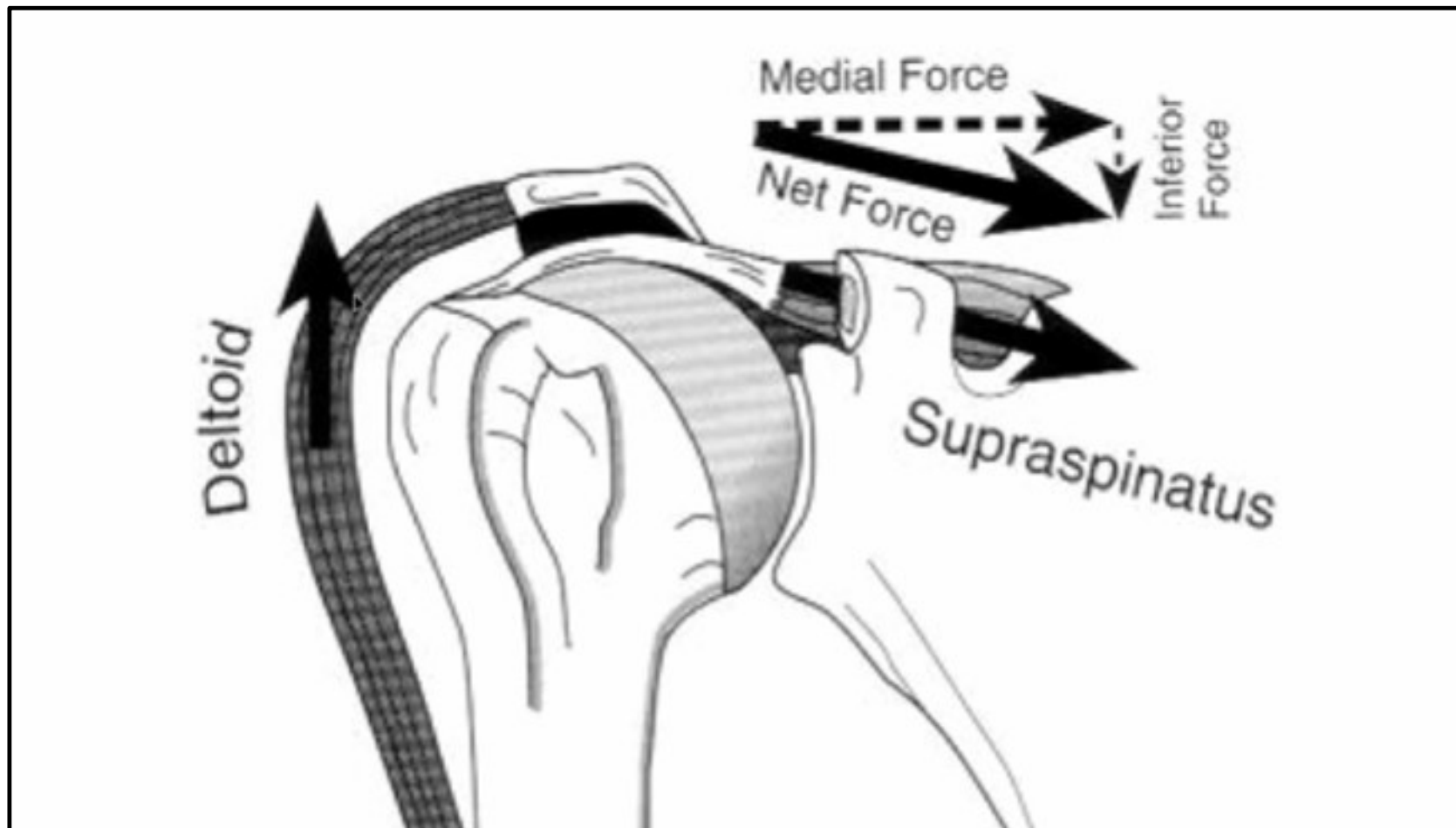




Shoulder Elevation

- How did you do it and how well did you do it?





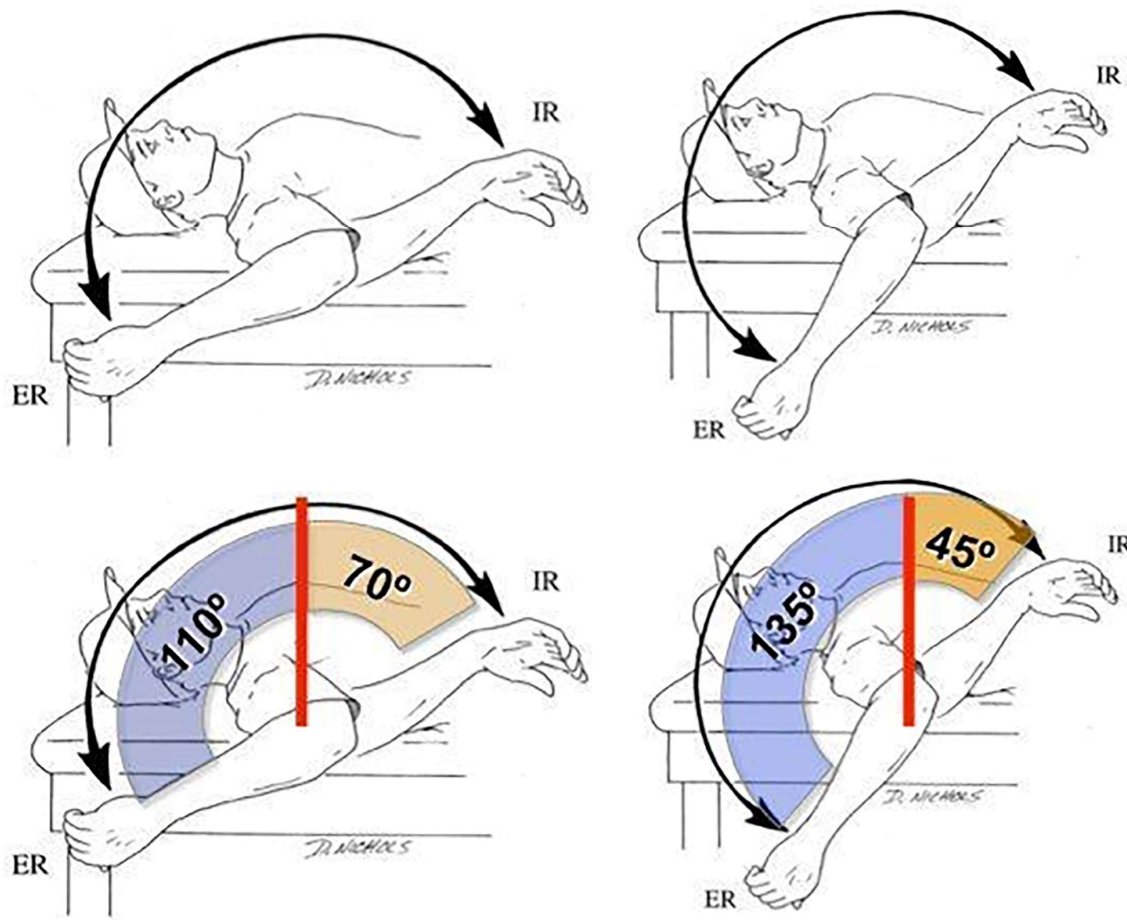
- **What is most mobile and what has the strength to accomplish a movement?**



Wolfe's Law

- Bone adapts to the stress placed upon them.
- Not only do muscles adapt but so do bones
 - Osgood Schlatter
 - Humeral Torsion from throwing
 - Seated posture





Structure vs Function

- Movement is based on an interaction of structure and function
- Structural: physical structure pathology (imaging)
- Functional: impaired function of structures (movement patterns)



Structure vs Function

- Does the imaging give us the entire story?
- Function requires a comprehensive examination
 - Posture
 - Gait
 - Balance
 - Muscle Length
 - Movement Patterns
- Early hypothesis to guide your objective exam
- Correlated subjective and objective findings or impairments
- Defines relationships between impairments
 - Exam should rule in/out what you see actively



Source vs Cause

- Source: Tissue or structure believed to cause the symptoms
- Cause: The mechanical factor that causes tissue irritation



Common Causes of Impairments

- Repeated Movements
- Sustained Postures
- Both lead to mechanical dysfunction



Contributing Factors to the Development of Impairments

- Muscle
 - Length
 - Strength
 - Stiffness
- Joint
 - Flexibility
 - Degenerative Changes

Restrictions in muscle length causes motor recruitment dysfunctions



Contributing Factors for the Development of Impairments

- Skeletal
 - Tissue Structure
- Nervous System
 - Recruitment patterns
 - Motor Control
- Biomechanical
 - Static Influence
 - Dynamic Influence



Contributing Factors for the Development of Impairments

- Factors that can affect the level of physical stress on biological tissue
 - Faulty movement pattern
 - Muscle force and or length
 - Posture and alignment
 - Physical activity
 - Occupational
 - Recreational
 - Self-care activities



Janda Approach: Basis of Musculoskeletal Pain Syndromes

- Certain groups of muscles are predisposed to tightness and weakness
- Muscle imbalances lead to changes in CNS motor program
 - Motor impairments
 - Pain

“Muscular system reflects status of CNS”



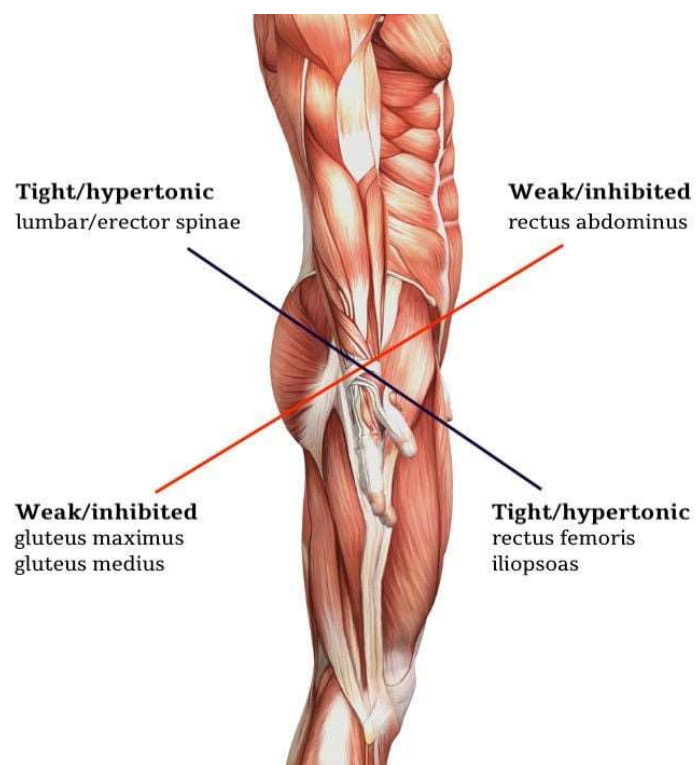
Role of CNS in functional movement

- Posture
 - Muscle tone
 - Eccentric control
 - Endurance
- Joint stability
 - Co contraction
 - Reflexive stability
- Balance
 - Balance reaction
 - Postural stability
- Movement
 - Muscle on/off
 - Dampen
 - Neutralize
 - Stabilize

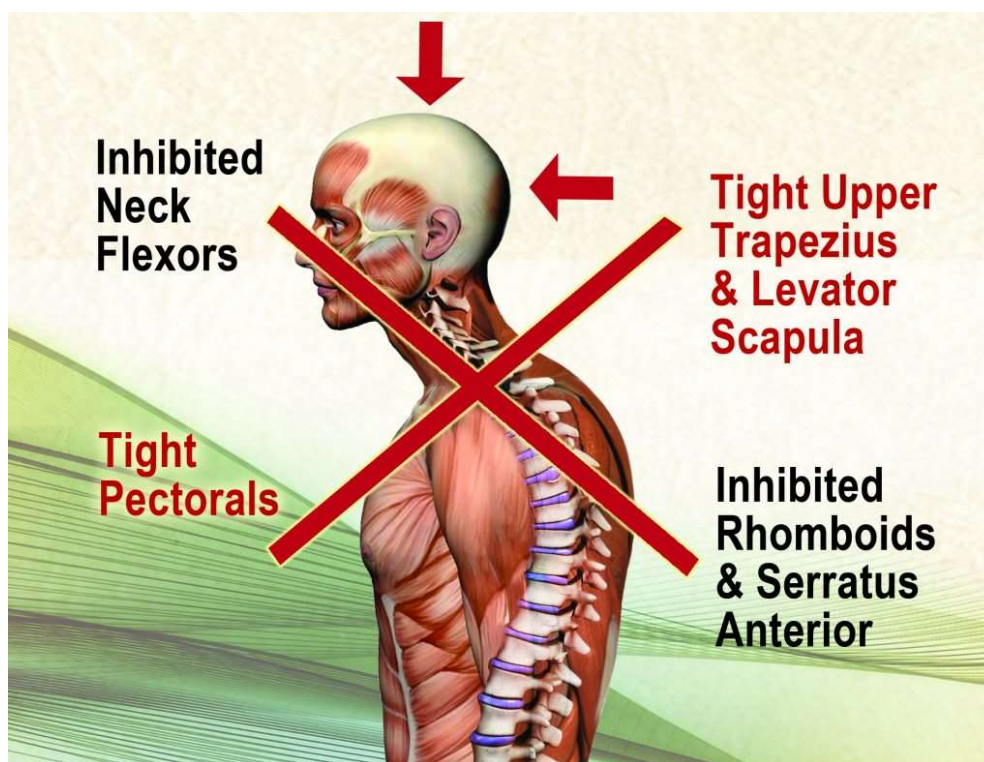
* limbic system regulates muscle tone*



Janda Lower Crossed Syndrome



Janda Upper Crossed Syndrome



<https://www.massagemag.com/upper-cross-controversy-addressing-postural-plasticity-121108/>



Static postural assessment

- Baseline postural assessment: What is the patient's preferred posture and movement strategies?
- **Functional Asterisk**
 - Take from the information gathered



Cues for postural analysis

- Start global assessment, then local
- Expose the area
- Use symmetry and shadows
- Hypertrophy → rounded, convex
- Hypotrophy → flat, hollow, concave
- Dominant eye
- Position: standing VS. seated
 - Clinical reasoning
 - When do they get pain?
 - Relate this to their occupation/day









Dynamic postural assessment

- Dynamic movement always requires some level of functional stabilization
- Motor planning
- Recruitment pattern
- Proprioception
- Compensatory patterns

Keep it functionally based!!!



Dynamic Postural Assessment

- Push
- Pull
- Reach
- Hinge
- Squat
- Lunge



Upper quarter dynamic postural assessment

- Overhead reach
- Reach across body
- Reach behind back
- Reach behind head
- Lifting



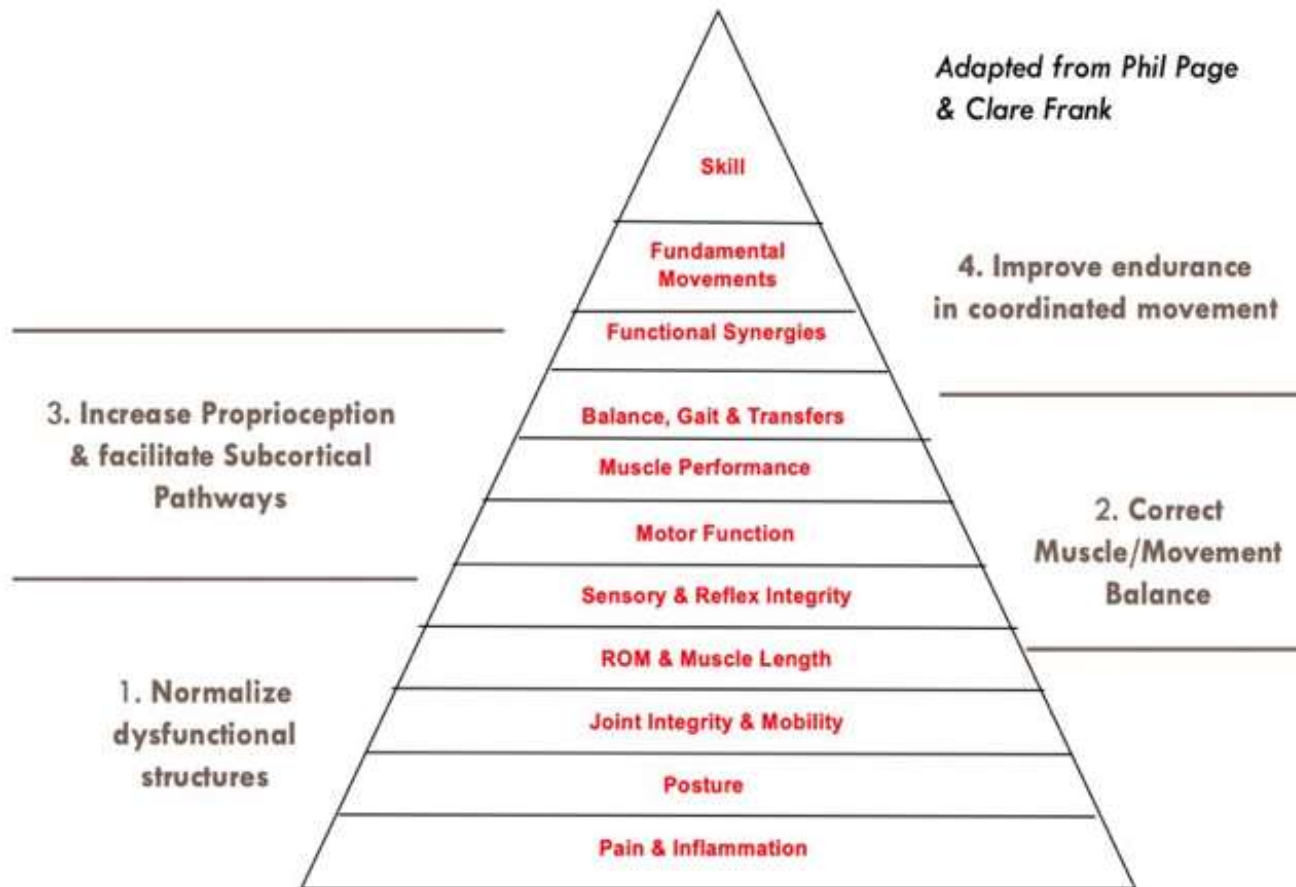
Lower quarter dynamic postural assessment

- Single leg balance
- Squatting
- Heel raises
- Transfers
- Gate
- Running
- Stairs



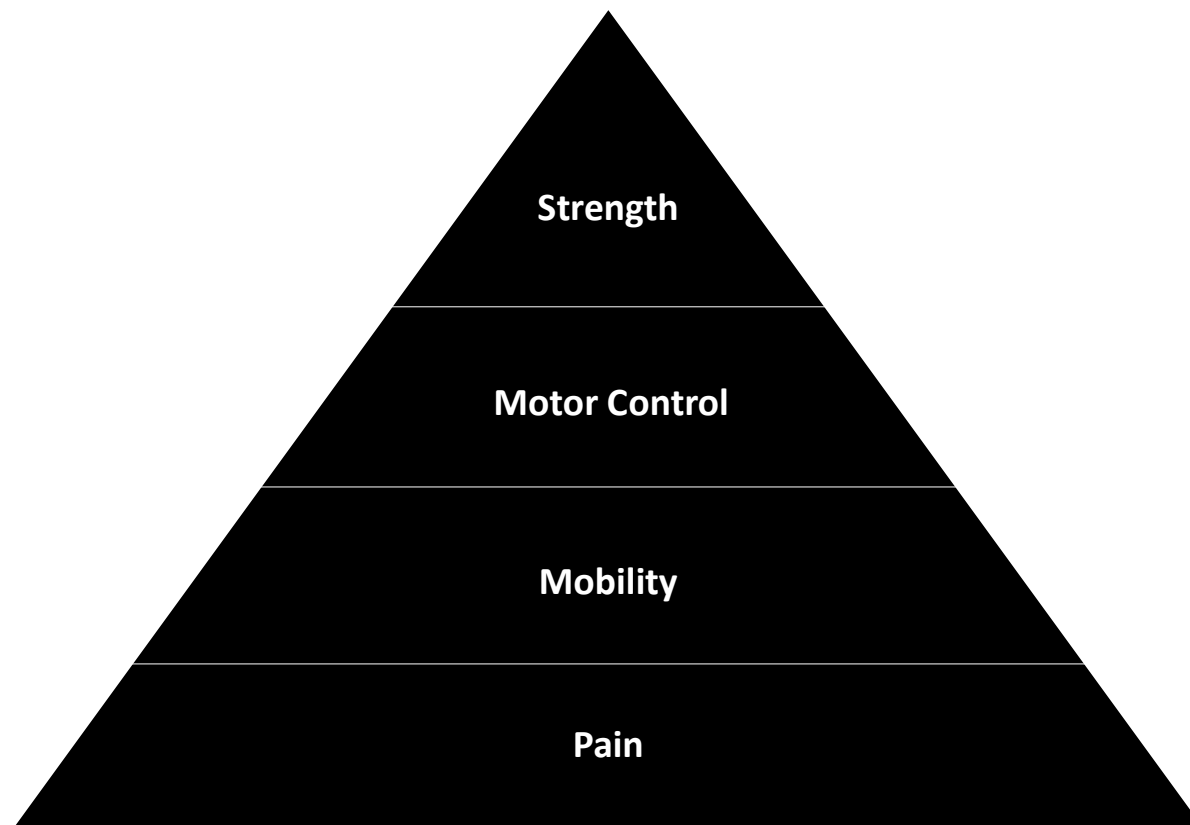
Functional Management Progression

*Adapted from Phil Page
& Clare Frank*



Optimize Functional Movement Through:

- **Optimizing**
 - **Mobility**
 - **Motor Control**
 - **Strength**



Let's Watch Someone Move



Questions?

