

The Human Movement System: Our Professional Identity The Importance of Diagnosis

Shirley Sahrmann, PT, PhD, FAPTA
Professor Emeritus

Program in Physical Therapy



Washington University in St. Louis
SCHOOL OF MEDICINE

Topics

- What is the Movement System?
- Why the focus on the Movement System?
 - Vision statement
 - Guiding principles
 - We have not defined our identity
- Why an Identity?
 - The detrimental effects of the title of “therapist”
- Why should the Movement System be our Identity?
- The highlights of the Movement System Summit
 - Terminology; examination; diagnoses
- Examples of Movement System Diagnoses
 - Movement System Impairment Syndromes

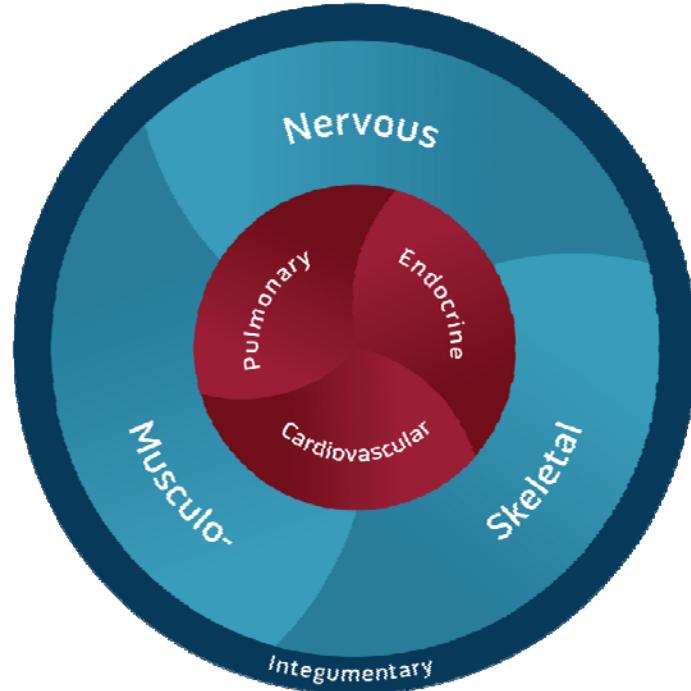


The Movement System

The Washington University Version

The Human Movement System

- Movement is an essential function of life at all levels of living organisms.
 - From ions moving through membranes to moving your limbs to moving in your environment



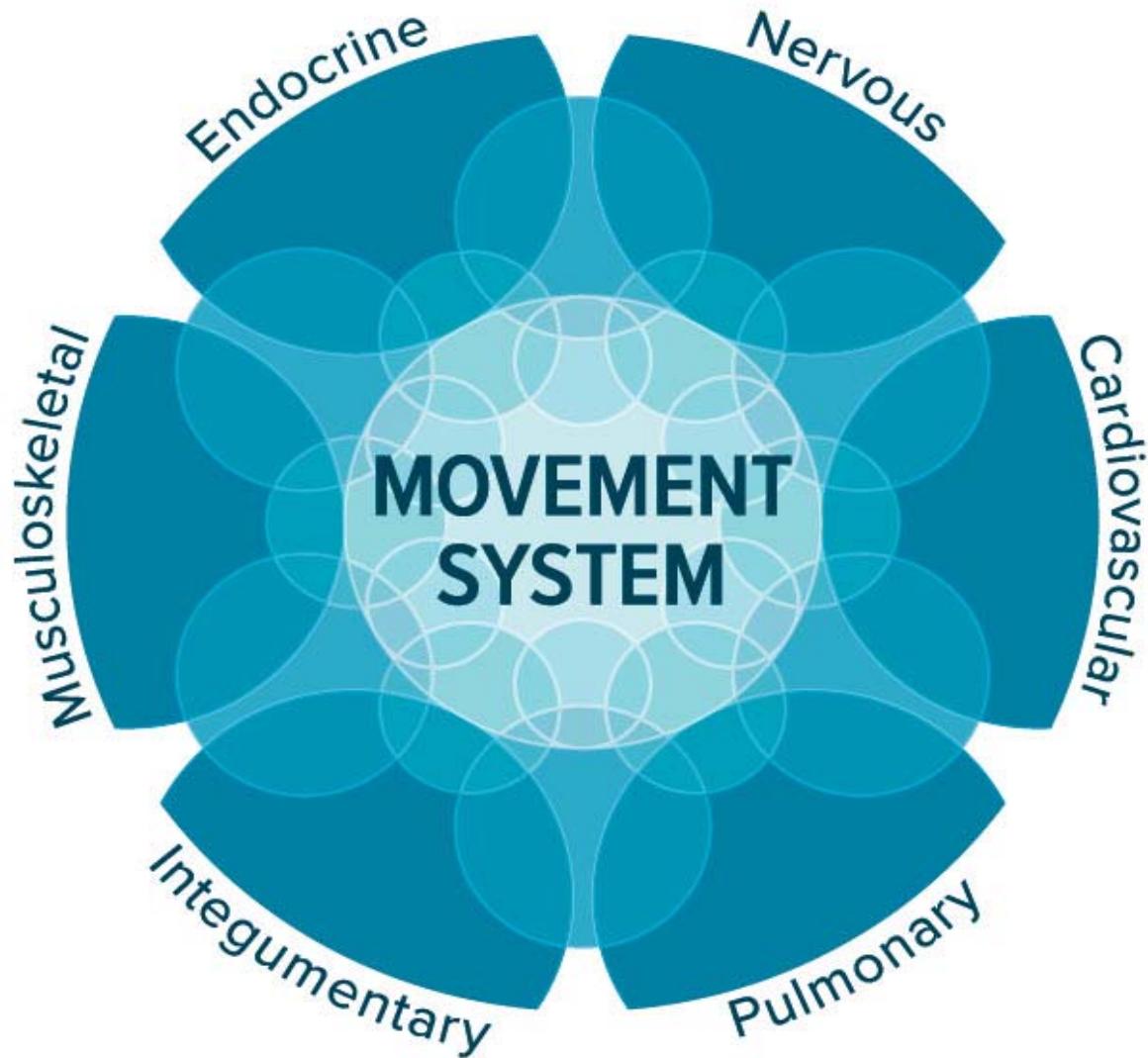
The human movement system is a system of physiological organ systems that interact to produce movement of the body and its parts.

<http://pt.wusm.wustl.edu/AboutUs/Pages/HumanMovementSystem.aspx>

Proposed Definitions of Movement System - APTA

- The human movement system comprises the anatomic structures and physiologic functions that interact to move the body or its component parts.
 - *APTA work group*
- The term used to represent the collection of systems (cardiovascular, pulmonary, endocrine, integumentary, nervous, and musculoskeletal) that interact to move the body or its component parts.
 - Current revision





APTA proposed graphic



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Definition Intent

- Intended to be generic and available to be used as are other physiological processes that become a particular focus.
- Other physiological processes that comprise multiple systems –a system of systems
 - Metabolic
 - Immune



PT Relationship to Movement System– 1 Body of Knowledge

- Physical therapists provide a *unique perspective* on
- purposeful, precise and efficient movement
- across the lifespan
- based upon the *synthesis of their distinctive knowledge* of the movement system and
- *expertise* in mobility and locomotion.
APTA work group



PT Relationship to Movement System – 2

Diagnosis & Intervention Objectives

- Physical therapists examine and evaluate the movement system (including diagnosis and prognosis)
- to provide a customized and integrated plan of care
- to achieve the individual's goal directed outcomes

APTA work group



PT Relationship to Movement System– 3

Develop & Implement Treatment

- Physical therapists maximize an individual's ability
- to engage with and respond to their environment
- using movement related interventions
- to optimize functional capacity and performance.

APTA work group



WHY THE FOCUS ON THE MOVEMENT SYSTEM?

2013 Vision Statement and 8 Guiding Principles



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APTA Vision Statement - 2013

- “The physical therapy profession
- will transform society
- by optimizing movement
- to improve the human experience.”

This new vision statement unflinchingly affirms that **movement is indeed the essence of physical therapy.**

Education & practice – not consistent
Pathoanatomic vs kinesiopathologic
or pathokinesiologic



Intro to Guiding Principles

- “*The physical therapy profession’s greatest calling is*
- *to maximize function and minimize disability for all people of all ages.*
- *In this context, **movement is a key***
- *to optimal living and quality of life*
- *for all people of all ages*
- *That extends beyond health*
- *to every person’s ability to participate in and contribute to society.”*



APTA Introduction to Identity

- Profession will define and promote
- **The movement system** as the foundation for optimizing movement.
- The recognition and validation of the **movement system** is essential to fully understand the physiological function and potential of the human body.
- The profession will be responsible for monitoring an individual's **movement system across the lifespan** in order to
 - promote optimal development, diagnose dysfunction, and
 - provide interventions targeted at preventing or ameliorating restrictions to activity and participation.
- The **movement system** will form the basis of practice, education and research of the profession."



Identity

- The characteristics determining who or what a person or thing is:
 - Oxford Dictionary
- Condition or character as to who a person or what a thing is
- The qualities, beliefs, etc., that make a particular person or group different from others
 - Merriam-Webster



PT and Identity – Hislop 1975

- PT is in the midst of a crisis of identity; a profession in search of an identity.
- Pathokinesiology is the distinguishing clinical science of physical therapy.
 - It is the study of anatomy and physiology as they relate to abnormal human movement
- PT can claim the unique privilege of placing the role of exercise in “health??” and disease in its proper scientific focus and perspective.
 - I wish – we are not even recognized for expertise in exercise except with post-surgical or paralyzed patients



PT and Identity—Rothstein 1984

- The *identity crisis* Hislop saw a decade ago has *worsened*.
- We, as a profession, may be doing more things,
- But in *no way* have we developed a *true sense of who and what we are*.
- All too often, we are *defined by the tasks we do*, and, as a result,
- only those who have seen therapists in practice have the vaguest notion of who and what we are.



PT and Identity 2017 – 33 Years Later!!??

- Where are we now in our identity?
- What has happened within the profession?
 - Research, education, practice
- Are the progressive changes in the profession evident to
 - Internal community
 - External community (the DPT degree)
 - Other health professionals
 - Our employers, our reimbursement sources
 - The public – consumers both patients & non-patients



PT DOES HAVE AN IDENTITY

HOW OTHERS SEE US

Is the identity appropriate for a major health profession?

What are the implications of this identity?



New Journal

- Physical Therapy and Rehabilitation is an Open Access journal published by Herbert Publications Ltd.
- Editorial Board has 14 members from Universities with PT Programs
- Here is the definition of Physical Therapy used by this journal?



Physical Therapy & Rehabilitation Definition

- Physical Therapy is the treatment which uses therapeutic and specially designed exercises,
- evidence evaluation of patient and application of physical modalities for restoration of physical function and movement contrived by illness or disorder.
- Rehabilitation is the process of regaining one's strength after a serious surgery or injury.



Other Definitions from Internet

- A branch of rehabilitative health that uses specially designed exercises and equipment to help patients regain or improve their physical abilities
- The treatment of **physical** dysfunction or injury by the use of therapeutic exercise and the application of modalities, intended to restore or facilitate normal function or development
- **therapy** for the preservation, enhancement, or restoration of movement and **physical** function impaired or threatened by disability



Implications of the Definitions

- Physical therapy is treatment
- Does not define the condition that is treated,
- Does not imply that therapists make a diagnosis of the condition
 - Easy to assume when the profession does not have diagnostic manuals
- Implies that another practitioner may have identified the underlying problem
- Suggests that treatment is not that complicated

We are recognized for what we DO
and NOT for what we KNOW



Movement System – A Body System

- Professions that have a respected identity are associated with a system of the body.
 - Cardiologist, Neurologist, Endocrinologist or
 - A well-defined disease: diabetologist, oncologist
- Why – the body system defines the body of knowledge of the practitioner to other health care practitioners and to public
- as well as knowledge of system dysfunctions and indicated treatment
- Advantage – implies that the practitioner can use whatever tools are necessary to diagnose and treat the system of responsibility



WHAT QUALITY DEFINES THE HIGHLY RESPECTED PHYSICIAN?



Diagnostic Manuals for Practice & Education

- The profession must have labels for conditions of the movement system that can be identified within our scope of practice.
- Necessary to convey that movement system dysfunctions can be classified.
- De-emphasize treatment approaches named for individuals and emphasize the underlying kinesiopathology or pathokinesiology
- No one will know or believe that PTs
 - can figure anything out or
 - that there is anything to figure out
 - if we do not put a label on conditions.
- Practice will be more parallel to other body system experts



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WHY SHOULD THE MOVEMENT SYSTEM BE OUR IDENTITY?

Our business model is going to change?

Our practice model has to change to meet the challenge
besides a change is the right thing to do!

Our educational model has to change to be consistent with
the major emphasis on being the expert

- 1.in movement analysis,
- 2.guiding the development of optimal movement,
- 3.diagnosing movement dysfunctions, and
- 4.development of programs for optimization, prevention,
and treatment



The Movement System

- Clarifies that the physical therapist has responsibility for a system of the body.
 - Respected health professions are identified with a system of the body
 - Provides a context for diagnoses that the physical therapist makes
 - No recognition for being able to identify a problem unless there is a label
- Informs other health professionals of the existence of movement based syndromes
- Physicians identify musculoskeletal problems based on pathoanatomy -
 - Tx *symptoms & consequences* by drugs or surgery
- Physical therapists identify neuromusculoskeletal problems based on pathokinesiology or kinesiopathology
 - Tx **cause** by movement



THE MOVEMENT SYSTEM SUMMIT

Terminology – Our Understanding of the Movement System

The Essential Components of Movement Analysis of Movement System Exam

The Criteria of a Movement System Diagnosis

An Amazing Success!!!



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Terminology

- The definition
- Relationship to
 - ICF,
 - Guide to PT Practice (patient/client management model) and
 - House of Delegates Policies
- Basically said no problem incorporating but a little short on specifics except that our emphasis should be on movement.



Essential Components of Movement Analysis as basis for MS Exam

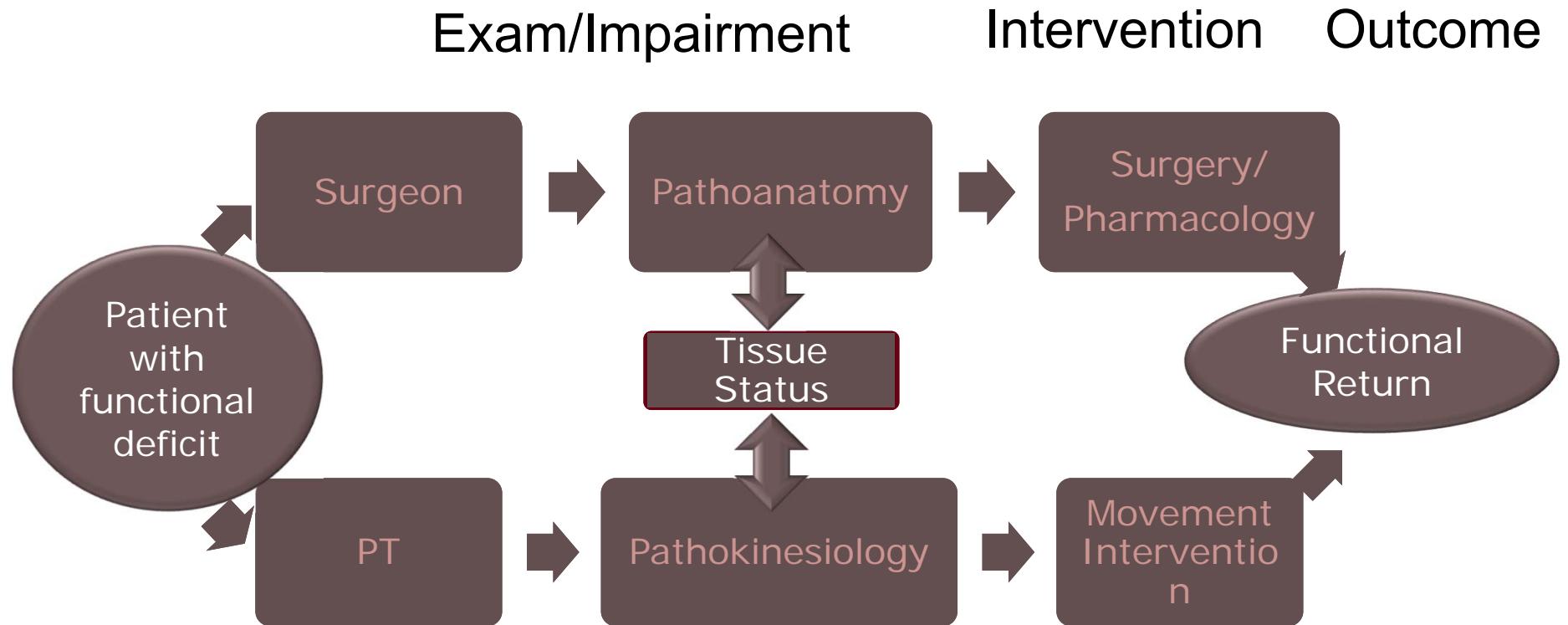
- Amazing consensus that there should be a standardized set of essential tasks
- Amazing consensus on tasks – was homework sent with examples
 - Locomotion, sit to stand, reverse, stepping up, standing, etc
- Need to formalize “what do you look for” during performance of these tasks?
- Need to describe the terminology to be used for the analysis
- Agreement on phases such as – initiation, execution, completion



Movement System

- *...Resolved, APTA endorses the development of diagnostic labels and/or classification systems that reflect and contribute to the physical therapists' ability to properly and effectively manage disorders of the movement system.*
- *Reference (RC 16-15): APTA House of Delegates 2015*





P Ludewig, PT, PhD



Pathoanatomic Diagnostic Labels

- Common and “Traditional”
- Communication with surgeons and other health care providers
- Focus on identifying **tissue pathology** as the basis for the patients pain or dysfunction
- Important to surgical decision making
- Important for PT decision making

Ludewig et al. JOSPT 2013



Concerns with Pathoanatomic Labels

- Often do not adequately direct physical therapy intervention
- Disconnect between our diagnostic and treatment process
- Inconsistent use among providers confounds communication

Ludewig et al. JOSPT 2013



Concerns with Pathoanatomic Labels

P Ludewig, PT, PhD

- Often we cannot determine an anatomical source
- What about co-existing pathologies?
- Tissue pathology not consistently linked to pain and function
- Tissue pathology is typically an intermediate or end result



Recommendations

P Ludewig, PT, PhD

- Need to target the right treatments to the right patients at the right dosages
- Why not identify movement impairment related diagnostic categories?
- There are clusters of patients with similar movement impairments who will likely benefit from similar treatments
 - Posterior capsule tightness
 - Microinstability



The Path Forward – Shoulder Dx P Ludewig

- Create a new diagnostic language
- Use accurate terms
- Don't subcategorize under Impingement, reconsider the condition, restart the conversation
- Mechanical impingement is a mechanism not the only mechanism, and not an ideal diagnostic label
- Understand what a surgeon hears when you say "Impingement"



The Time is Right

- Shoulder surgeons – recognizing that movement is a contributing factor not just structural impingement
- Hip structural variations – induced by intensive sports during growth periods
 - Escalating surgery
 - Parallel to shoulder impingement
- Presentations at 3 physicians meetings
 - Want to incorporate movement analysis items in their exams
 - How to find “good” PT
 - Emphasis on what is wrong with the tissues – how to treat with drugs and surgery
 - Not on how the tissues got that way



Why are Diagnoses so Important?

- What is the difference between a novice and an expert?
 - Pattern recognition
 - Diagnoses are patterns
- The large majority of conditions diagnosed by MDs do not have a clear pathophysiology. - pattern recognition
 - That is why “critical thinking” of what is known in PT is not adequate
- No one will know we can figure anything out if we do not use labels
- Not considered a source of referral for diagnosis
 - My uncle
 - GTP
 - #choosePT



Diagnostic Criteria from Summit

- Use recognized movement-related terms to describe the condition or syndrome of the movement system.
- Include, if deemed necessary, the name of the pathology, disease, disorder, anatomical or physiological terms and stage of recovery associated with the diagnosis.
- Be as succinct and direct as possible to improve clinical usefulness.
- Strive for movement system diagnoses that span all populations, health conditions and the lifespan.
- Whenever possible, similar movement related terms should be used to describe similar movements, regardless of pathology or other characteristics of the patient.

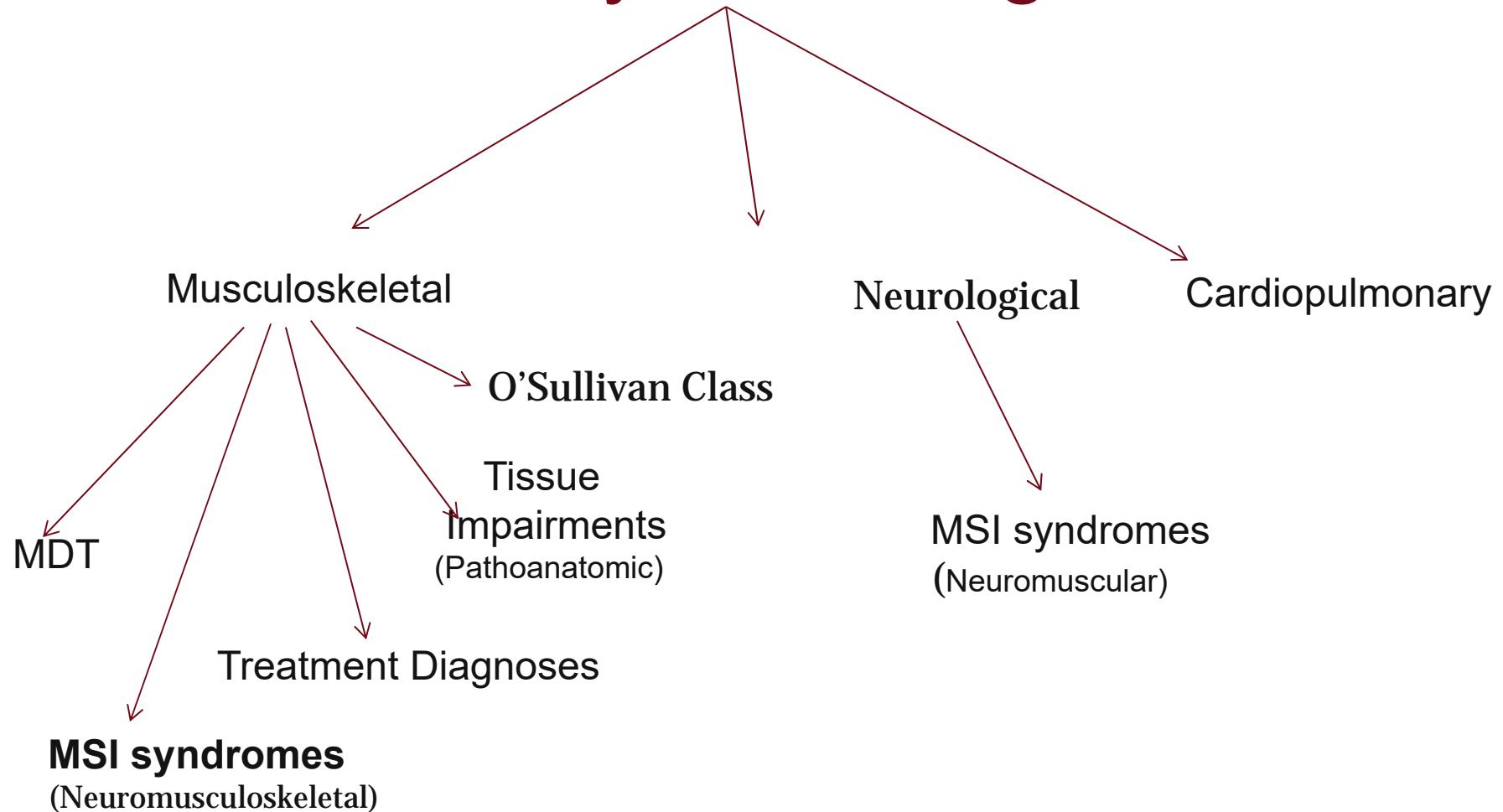


EXAMPLES OF MOVEMENT SYSTEM DIAGNOSES

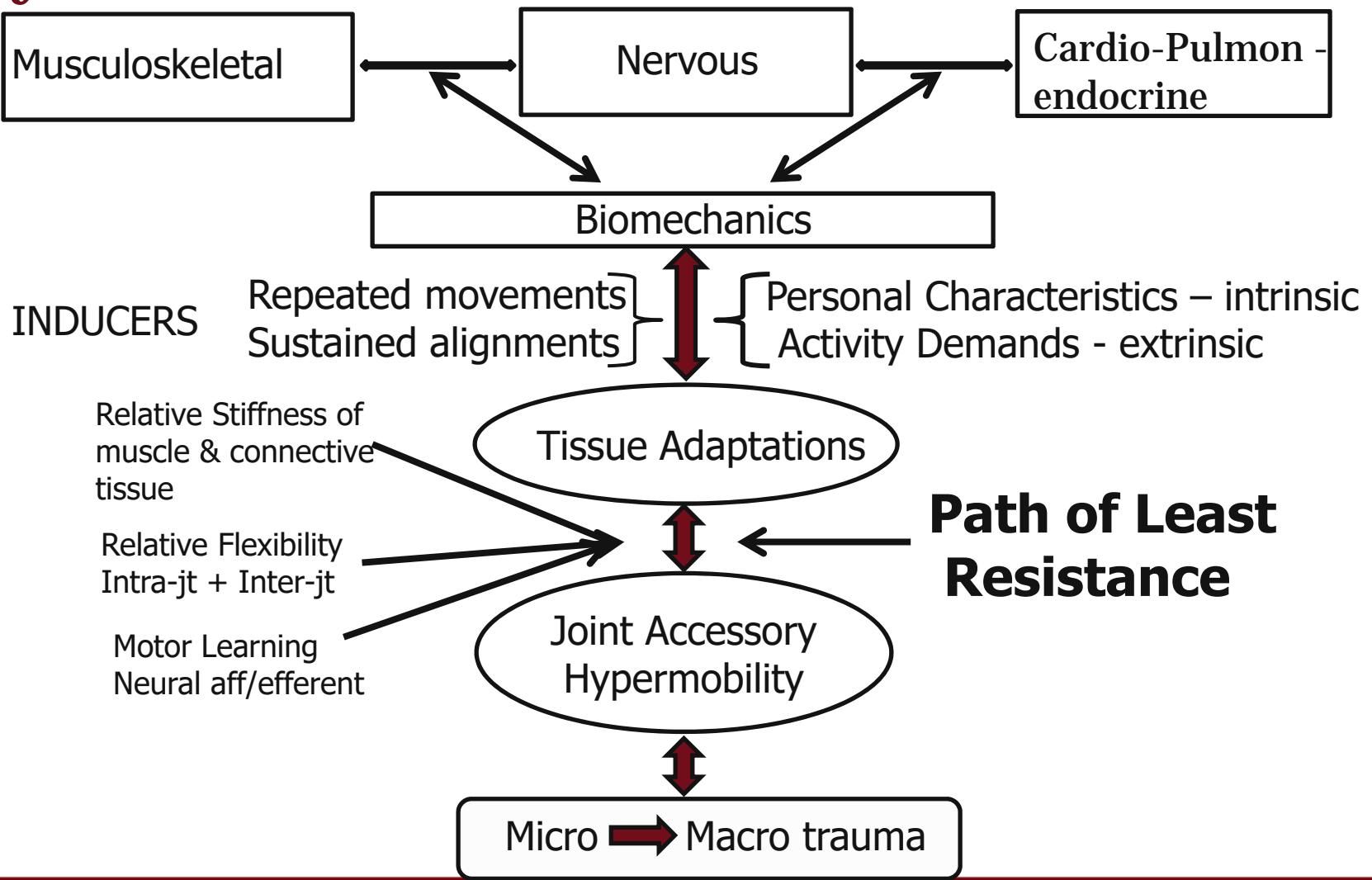
Movement System Impairment
Syndromes - not APTA endorsed



Movement System Diagnoses



Kinesiopathologic Model of Movement System



Working Theory

- Musculoskeletal pain is
 - Related to **lifestyle** similar to many other health conditions
 - A progressive condition
 - Starting with acute pain – first indication of tissue damage
 - High reoccurrence rate - leading to chronic problem
 - The result of tissue changes associated with
 - Aging related degeneration and
 - Activity induced tissue injury from impaired joint movement



The Challenge: Keeping the Acute Problem From Becoming Chronic

- Acute symptoms subside
 - With time
 - With variety of interventions addressing symptoms
- Recurrence is common
 - Pathoanatomic structures considered the cause
 - The impaired movement not considered as cause
 - Therefore has not been identified & addressed.
- To minimize recurrence –
 - identify the movement cause & contributing factors
- Develop a treatment program that includes
 - Patient specific exercises
 - Correction of performance of basic daily activities
 - Correction of performance of work, recreation, fitness, & sports activities

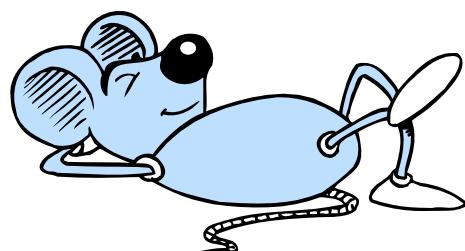


REPETITION OF IMPAIRED MOVEMENT MAY ACCELERATE THE DEVELOPMENT OF OSTEOARTHRITIS



Experimentally Induced OA

- Osteoarthritis development in novel experimental mouse models induced by knee joint *instability*
- Kamekura et al.
- OsteoArthritis and Cartilage (2005) 13, 632-641
- The surgical *destabilization* of the medial meniscus (DMM) model of osteoarthritis in the 129/SvEv mouse
- Glasson et al.
- OsteoArthritis and Cartilage (2007) 15, 1061-1069



Key Concepts

- Path of Least Resistance for Motion
- Relative Stiffness and Relative Flexibility
- You get what you train (many strategies to create moments at a joint or within a limb; varying motor patterns)
- Presence of a muscle does not mean that it is being appropriately used
- No magic in an exercise except if the desired motion is evident
- The way everyday activities are performed is the critical issue
- Hypermobility (accessory/arthrokinematic motion) causes degeneration & pain



Movement System Impairment (MSI) Syndromes

- Named for movement direction that causes symptoms and that is impaired. Correction of the movement usually decreases the symptoms.
- Identify the cause of the dysfunction & contributing factors
 - neuromusculoskeletal impairments
- Organize & cluster specific tissue and movement impairments
- Provide a direction for treatment
 - does not require identification of a specific pathoanatomical structure (**source**)
- Based on anatomy and kinesiology



Movement System Impairment Syndromes

■ Low Back

- Extension
- Extension-rotation
- Rotation – primary & secondary
- Flexion
- Flexion-rotation

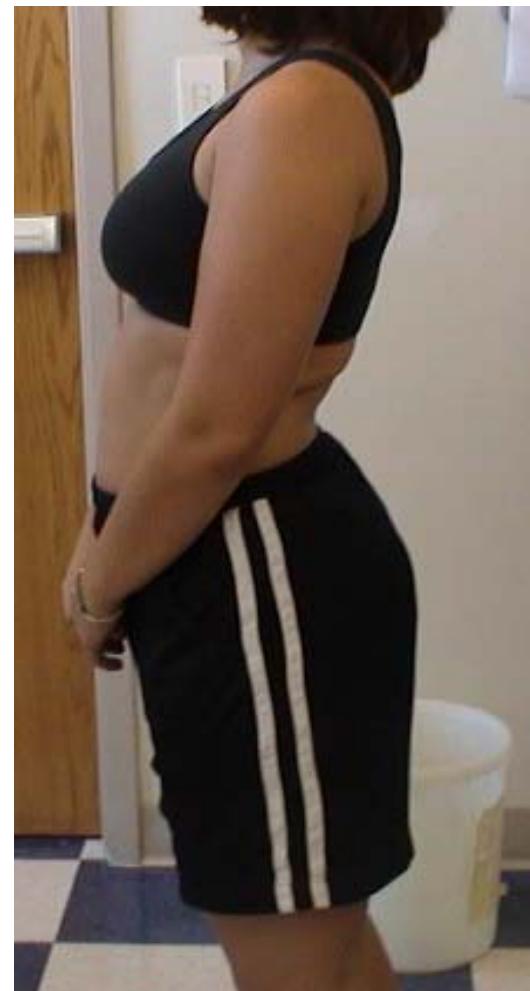


Extension Syndrome

Test = Standing Alignment

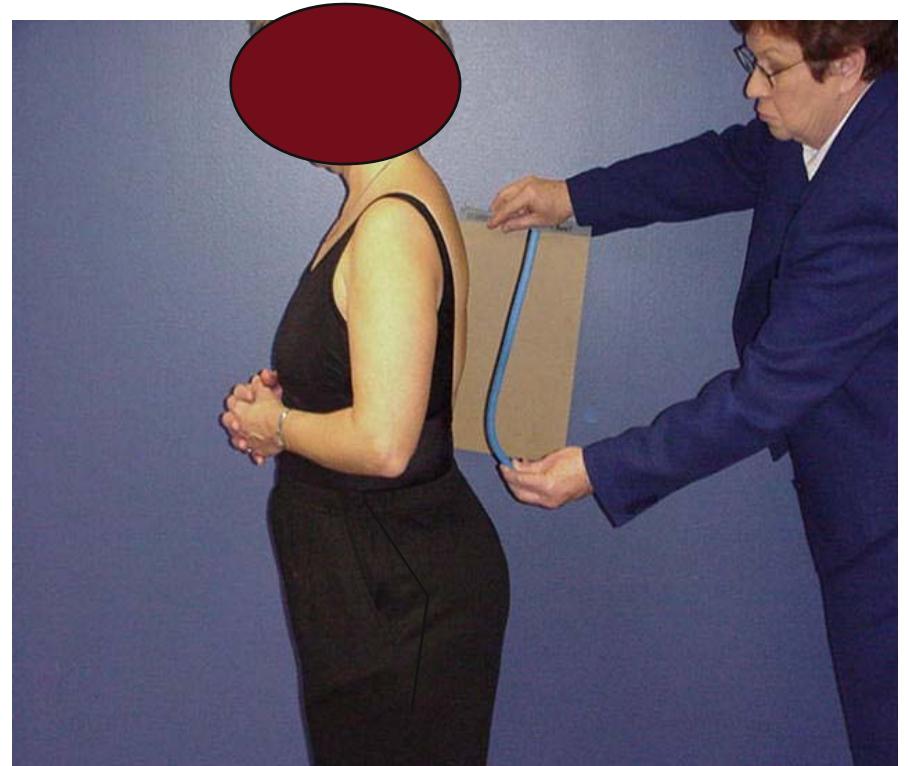
Why does she stand
this way?

- Lordosis with swayed upper back
- Anterior pelvic tilt
- What is her sport?
- What are the tissue impairments?



Low Back Pain: Case Presentation

- Pain with standing worse than sitting
- Age 45
- Height 5' 3" (160.5 cm)
- Weight 140 lbs (63.5 kg)
- Lordosis with anterior pelvic tilt
- Piano teacher



Low Back Pain: Case Presentation

Physical Exam:

- Forward bending decreased pain barely reverses lumbar curve
- Return with lumbar extension > hip extension
- Extension - increased pain



Sitting Posture when Teaching & Playing the Piano



Low Back Pain: Case Presentation

- Age 23
- Weight 175 lbs (80 kg)
- Height 6 ft (183 cm)
- Student
- Competitive cyclist
- Flat lumbar spine
- Tentative MSI diagnosis?



Low Back Pain: Case Presentation

- Excessive lumbar flexion
- Decreased hip flexion
- Low back pain is increased



Lumbar spine flexed
Hips not flexed to 90 deg

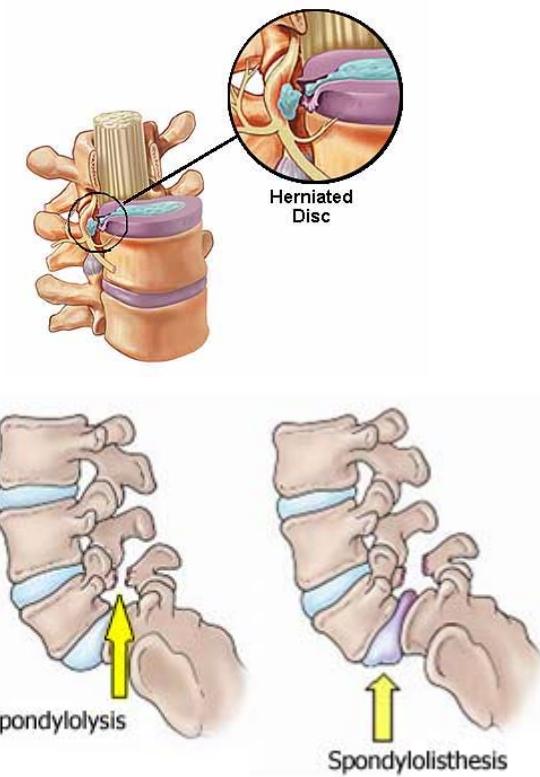
Pts with LBP – Clustering of Potential Findings

	Flexion	Extension
Characteristics	Young/tall	Old/short
Abdominals	Strong/stiff	Weak/long
Back extensors	Weak/long	Strong/stiff
Hip flex length	Long	Short/stiff
Hip ext length	Short/stiff	Long
Activities	Sit flexed	Sit extended



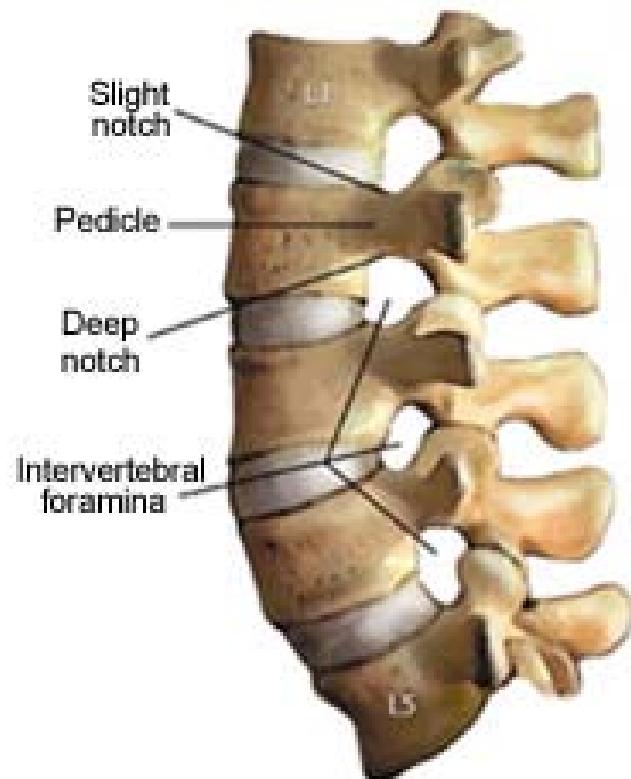
Spinal Pathology and Movement

- **Disc herniation** – offending motions
 - Flexion and rotation
- **Spondylosis** - degenerative osteoarthritis of the joints between the centra of the spinal vertebrae and/or neural foraminae.
- **Spondylolysis** is a defect of a vertebra. More specifically it is defined as a defect in the pars interarticularis of the vertebral arch
- **Spondylolisthesis** - anterior or posterior displacement of a vertebra or the vertebral column in relation to the vertebrae below.
 - All extension induced
- **Spinal stenosis**
 - extension induced

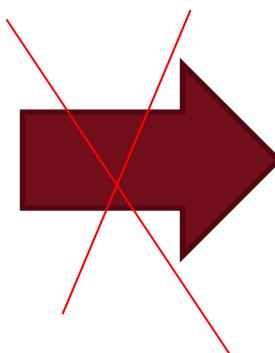


Spinal Changes – Can be Prevented

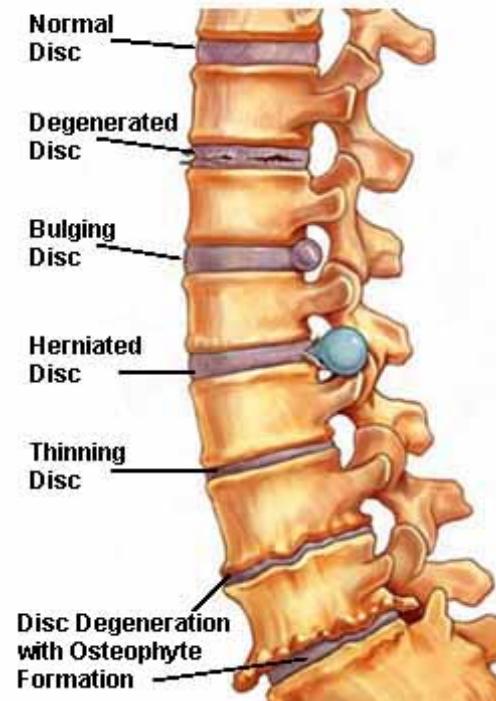
Young



Activity and Aging



Examples of Disc Problems



Key Concepts II

- The way everyday activities are performed is the critical issue
 - Repeated movements and
 - Sustained alignments



Changes in Oswestry Disability Index

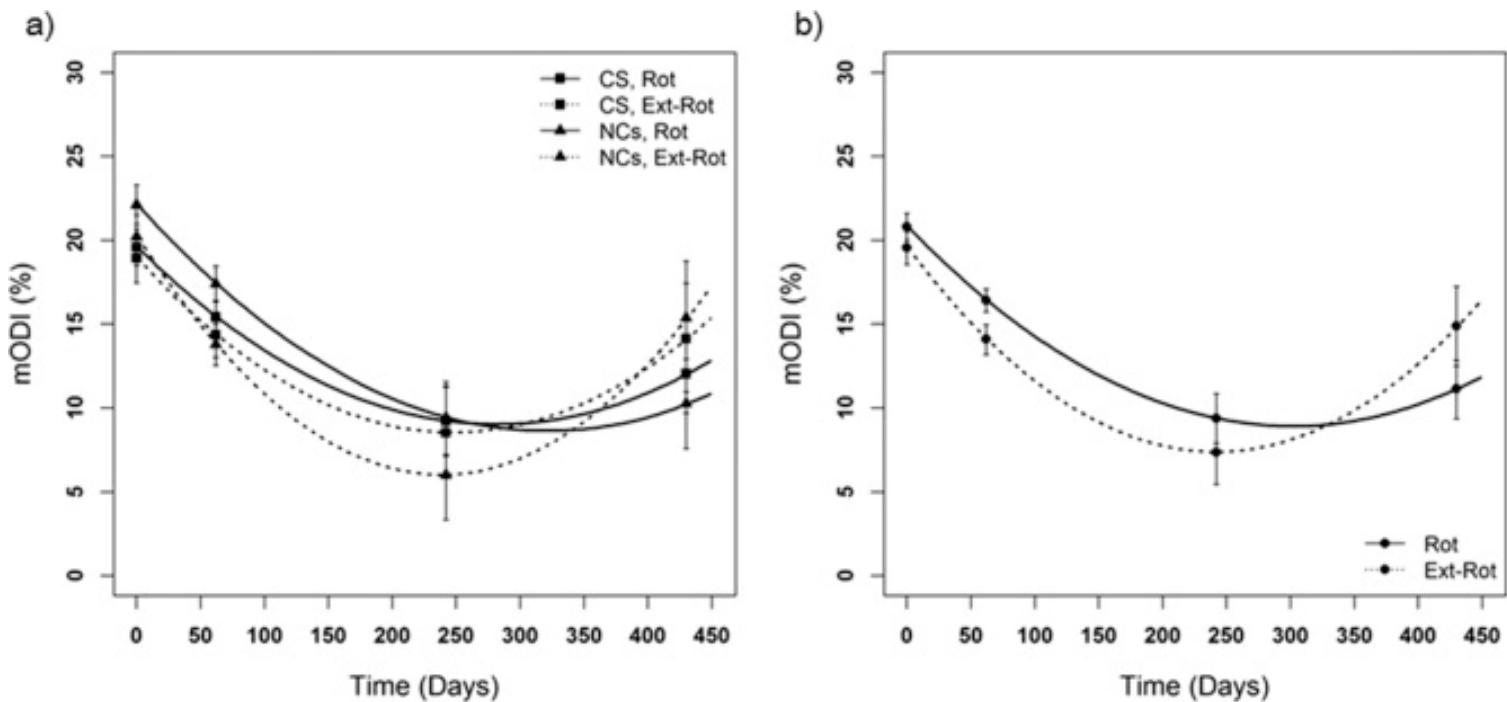


Fig. 2. a. Predicted values and 95% confidence intervals based on hierarchical linear modeling analyses of the modified Oswestry Disability Index (mODI) scores for the classification-specific (CS) rotation (Rot) and extension-rotation (ExtRot) groups and the n...

Linda R. Van Dillen, Barbara J. Norton, Shirley A. Sahrmann, Bradley A. Evanoff, Marcie Harris-Hayes, Gregory W. Holtzman, Jeanne Earley, Irene Chou, Michael J. Strube

Efficacy of classification-specific treatment and adherence on outcomes in people with chronic low back pain. A one-year follow-up, prospective, randomized, controlled clinical trial

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Adherence to Performance Training

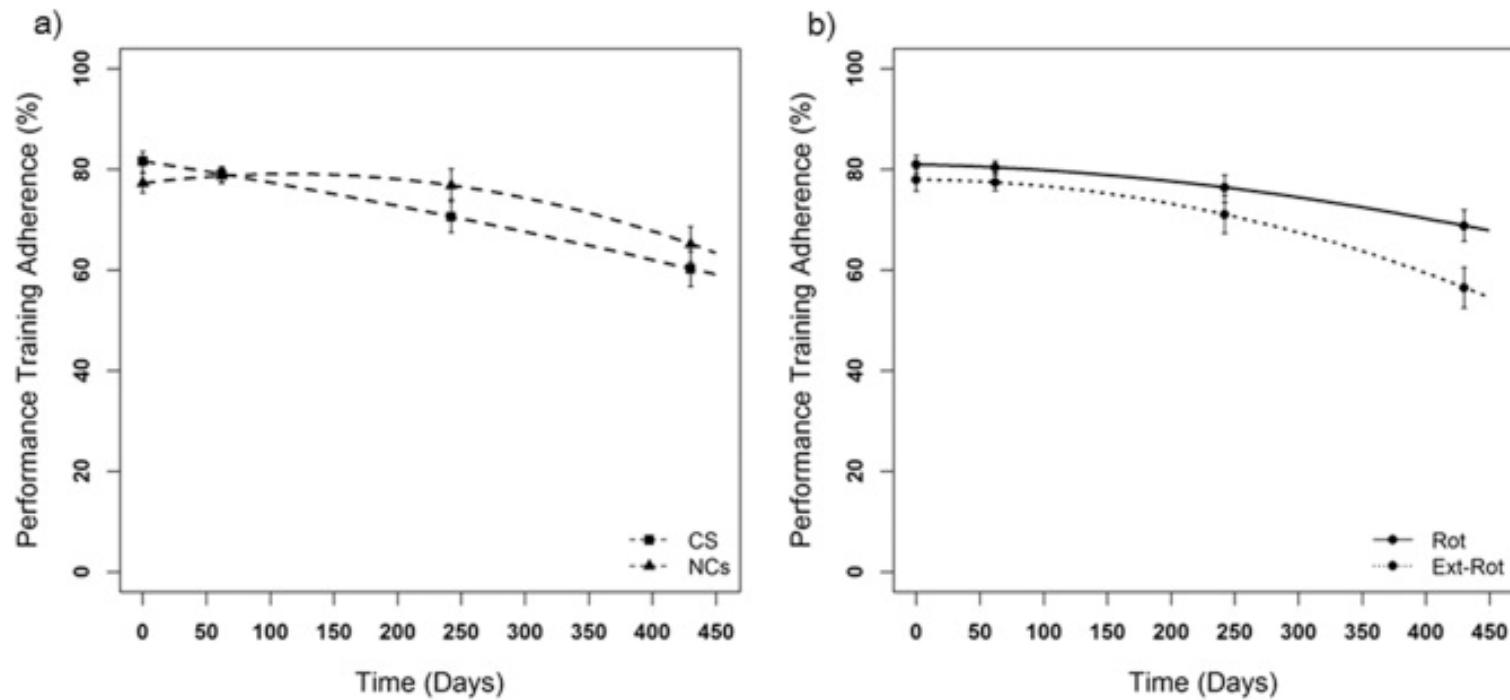


Fig. 3. a. Predicted values and 95% confidence intervals based on hierarchical linear modeling analyses of the adherence to performance training for the classification-specific (CS) group and the non classification-specific (NCs) group at the 2nd treatment visit.

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Adherence to Exercise

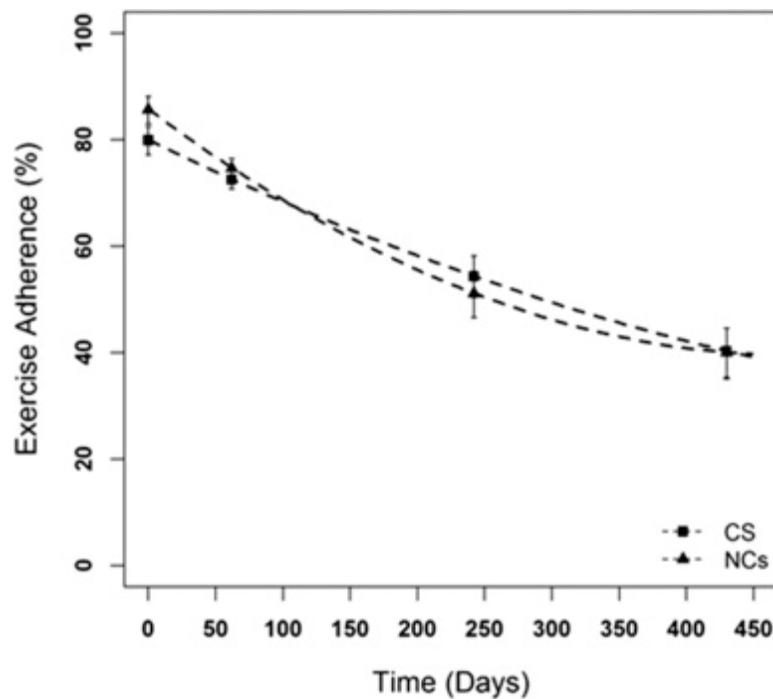


Fig. 4. Predicted values and 95% confidence intervals based on hierarchical linear modeling analyses of the adherence to exercise for the classification-specific (CS) group and the non classification-specific (NCs) group at the 2nd treatment visit, post-treatm...

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Summary – Need your Help

- Promote the movement system
- Development of a basic movement system exam
 - Emphasis on movement analysis of fundamental tasks
 - Developing terminology for “what do you look for?”
- Develop and use diagnostic categories
- Emphasize lifespan practice
- Develop and implement treatment programs based on the diagnosis and contributing factors
 - Address the way daily activities are performed.

