Movement Dysfunction

*In the Athlete*

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Movement Dysfunction

- Neuromuscular System
- Areas of body that move poorly
- Body is adaptable and seeks non-painful movement
- Will continue with poor movement pattern after painful stimulus is gone

*He who only treats the site of pain is often lost*  
*(Karl Lewitt)*
Movement Dysfunction

- Postural Restoration Institute
- National Academy of Sports Medicine (NASM-CES)
- Kinetic Chain Assessment
- Functional Movement Screen
- Vladimir Janda Approach
- Dynamic Neuromuscular Stabilization
- Shirley Sahrmann
- Anatomy Trains
- Breathing Dysfunction
- PRI techniques (Ron Hruska, PT)
  - Neuromuscular system addressing imbalances and typical patterns associated with system disuse or weakness that develops because of dominant overuse.

- NASM - CES
  - Uses 2 leg and 1 leg squat assessment to assess movement
  - Assess Anterior, Posterior, and Lateral

- Functional Movement Screen (Gray Cook, PT)
  - 7 tests to assess movement (Squat, Lunge, Single Leg Hurdle, Core, Thoracic Rotation, etc)

- Shirley Sahrmann
  - One of original PTs that addressed movement impairment
Movement/ Squat Dysfunction

- Janda approach and DNMS (Vladimir Janda, DO)
  - Prague School (Czech)
  - System that addresses neuromuscular and neuro development systems
  - Assess muscle imbalances
    - lower cross syndrome - weak glute/ core, tight hip flexor/ erector spinae
    - upper cross syndrome – weak scap retract/ deep neck flex, tight U. trap/ L.Scapulae

- Anatomy Trains (Thomas Meyers)
  - Looks at how the whole body is connected through 12 Trains
  - Developed by, associated with Rolfing techniques
Movement Dysfunction

- Asymmetry leads to overuse in sports or life
- Goal = To Become and maintain NEUTRAL
Movement Dysfunction

- Neutral 1st
- Strength 2nd
Squat Dysfunction

The squat is natural to all humans during normal development.
Many eastern cultures squat as a matter of lifestyle.
Squat Dysfunction

In western culture we begin to sit in chairs and lose the ability to squat
Movement/Squat Dysfunction

- Poor Squat Technique
WHAT IF I TOLD YOU

SQUATTING DOESN'T HURT YOUR KNEES. HOW YOU SQUAT HURTS YOUR KNEES.
Assessment and Treatment of Muscle Imbalance

The Janda Approach

Phil Page
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Janda Approach
The Janda Approach

• Dr. Vladimir Janda (1923 – 2002) was a Czech Neurologist and Physiotherapist.
• Identified 2 schools of thought in musculoskeletal medicine **Structural** and **Functional**.
• Structural is rooted in anatomy and biomechanics, tissue lesions such as an ACL tear or broken bone are treated with surgery, immobilization, or rehabilitation.
• We diagnose these with special tests, MRI, CT scans, x-rays
The Janda Approach

• Janda was 1\textsuperscript{st} to identify that asymmetries are rooted in functional neuromuscular imbalances and not structural lesions

• To correct asymmetries we need to affect neuromuscular system

• **AFFECT, RETRAIN, RESET**

• The functional approach allows us to better understand the cause of pathology and not focus on the pathology itself
The Janda Approach

• **Muscle Balance** is defined as a relative equality of muscle length or strength between an agonist and an antagonist; *this balance is necessary to normal movement*

• Pathologic muscle imbalance leads to joint dysfunction and altered movement patterns which in turn lead to pain
Muscle Imbalance Paradigm

Biomechanical

Neurological
Muscle Imbalance Paradigm

Biomechanical
- Traditional view of biomechanics
- Cause of muscle imbalance is the constant stress that muscle experience due to prolonged postures and repetitive movements.
- Often referred to as the Sahrmann approach; sustained postures lead to adaptations

Neurological
- Janda felt that muscle imbalance in today’s society is compounded by lack of movement through physical activity and lack of variety of movement – i.e. youth sport specialization
- The neural control unit may alter the muscle recruitment strategy to stabilize joints temporarily IN DYSFUNCTION
Neurological Paradigm

- Janda states that muscles are at a functional crossroads in the nervous system.
- They respond to stimuli from the CNS as well as react to changes in the PNS.
- These natural reflexes influence muscle balance and function.

Chronic M-S pain result from defective motor learning and prevents the motor system from properly reacting to changes in the body.
Altered Movement Patterns

Muscle Imbalance Response

Structural: Pain and Inflammation

Functional: Abnormal joint position or motion
Assess Muscle Imbalance

**Lower Cross Syndrome**
- Weak glute
- Weak core
- Tight hip flexor
- Tight erector spinae

**Upper Cross Syndrome**
- Weak scapular retractors
- Deep neck flexor tightness
- Tight upper trap
- Tight levator scapulae
National Academy of Sports Medicine – Corrective Exercise Specialization
NASM
• Uses 2 leg and 1 leg squat to assess muscle imbalance
• Posterior, Anterior and Lateral View
• Looking for Asymmetry
• Most Common findings w/ 2 leg squat
  – Asymmetric shift to R
  – Forward Trunk Lean
  – Arms Fall Forward
NASM – Common Asymmetries

Forward Trunk Lean

Valgus Knees

R shift
NASM – Common Asymmetries

Arms Fall Forward
Right Shift

• Indicates Tight Right ADDuctor and Tight Left ITB
• Pulls subject into a Right shift with squat
• Correct by foam rolling/stretching Left ITB and R Groin
• Activate Right hip ABDuctor and Left ADDuctor

Forward Lean

• Indicates tight Hip flexor and erector spinae
• Pulls Hip forward
• Corrected by Foam rolling and stretching Psoas?
• Activating Glute Maximus
Arms Fall Forward

- Indicates Tight Lattisimus Dorsi
- Pulls subjects arms forward of ears
- Correct by foam rolling/stretching Lats
- Activate Scapula retractors
Exercise to Correct Right Shift

Foam Roll Left ITB and R Groin
Exercise to Correct Right Shift

Activate Left ADDuctor and Right ABDuctor
Start  Middle  Finish
PRI Typical Asymmetry Patterns

→ Right Brachial Chain (BC) Thoracic and Neck to Left

→ Left Anterior Interior Chain (AIC) Pelvis, Lumbar Spine and Diaphragm to Right
Pelvic Position

- Left Pelvis = flexion, ABDuction, and ER

- Right Thoracic (above T4) = Low, Protracted or Left Rotation
WHY are we Asymmetric?

- Anatomy
  - Right = Liver, 3 lobes of Lungs
  - Left = 2 lobes of Lungs
- RH Dominant patterns
  - Reaching w/ R hand
- Counter-clockwise world
WHY are we Asymmetric?

- Typical Patterns
  - Life Patterns (ADLs)
  - Standing on Right Leg
  - Reaching with Right Arm
  - Tucking Left Leg under you while sitting
    (which I find myself doing as a review this slide)
  - Sitting in car with Left Leg against car door
PRI findings – Lower Extremity

- (+) Adduction Drop Test (Ober’s test)
- Decreased Left Hip IR
- Decreased Right Hip ER
PRI findings – Upper Extremity

- Left Anterior Rib Flare
- Right GIRD (glenohumeral IR deficit)
- Upper Chest Breather
- DEC Right Apical Expansion (Breathing into L more than R)
- Decreased Left Horizontal ABdution
PRI findings – Upper Extremity

- Right Side of Thorax – (Full)
- Left Side of Thorax – (Open)
- Easier to breathe into Left Side of Thoracic due to space
- Stronger Right Diaphragm pulls air into Left Thoracic
- Right Diaphragm attaches lower on spine and has leverage from liver
Main reason for PRI findings

- Diaphragm Dysfunction
- Standing on Right Leg
Breathing Dysfunction

How Many Times per day do we breathe?
Breathing Dysfunction

- Paradoxical Breathing
- Upper Chest Breather
  - Uses Scalenes and SCM
- Abdomen Sucks In
- Can we throw in this position? Function?
- What common “disorder” associated w/ this position?
Correct Breathing Pattern

- Goal is for air to expand rib cage equally on all 4 sides
  - Hula Hoop to Key Ring
- Goal is for lower rib cage to expand
- NOT Belly Breathing
Correct Breathing Pattern

- Exhale fully
- Allows Rib Cage to lower
- ADIM v Abdominal bracing v Left AB Wall
- Engages Internal Obliques and Transverse Abdominus
- Pull Left Lower Rib Cage to Left Pelvis
GIRD or TERD

- Is the Glenohumeral joint tight?  
  or  
- Is the thoracic “stuck”?  
  
  - Does the scapula move on the thoracic?  
    or  
  - Does the thoracic move on the scapula?
Treatment for PRI

- Repositioning Exercises
- Non-Manual Techniques
  - 90 - 90 Wall Hip Lift
  - 90 - 90 Wall Hip Lift w/ Hip Shift
  - 90-90 Wall Hip lift and shift with Right Arm Reach
- Manual Techniques
PRI – Left AIC exercises

*** Must hold for 4 slow deep breaths, 4 times

90 - 90 Wall Hip Lift w/ Hip Shift (Left Hamstrings and Adductor)

90 - 90 Wall Hip Lift (Left Hamstrings)
PRI – Left AIC exercises

start

PRI Right Clamshell (R Glute Max)

finish

*** Must hold for 4 slow deep breaths, 4 times
PRI Summary

- If Left Hamstring activation corrects L “OBER”

Is It a Tight IT Band?

- If Left Hamstring and Left Ab Wall activation corrects R GIRD

Is it a Tight Posterior Capsule of the shoulder?
Thoughts?

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