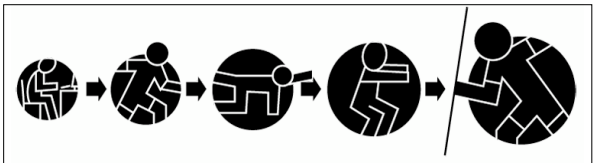

Functional Pathology of the Motor System

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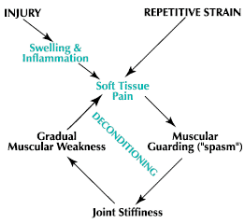
OUR PHILOSOPHY

- Find the Source of Pain
- Functional Goals of Care
- Modern Approach to Fitnes
- Functional Approach - Biomechanics
- Patient Expectations

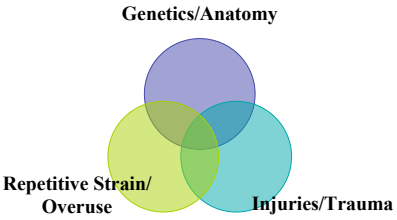
FINDING THE SOURCE OF PAIN



Injury

Repetitive Strain

What leads to pain?



Repetitive Strain/ Overuse

- If ACTIVITY DEMANDS exceed FUNCTIONAL CAPACITY this will cause repetitive strain
- Any GAP between DEMANDS & CAPACITY must be erased by *postural advice* & *core-stability training* in order to address the **"weak link"**

Site vs Source of Pain

Site

- Pain Generator
- Structure

Source

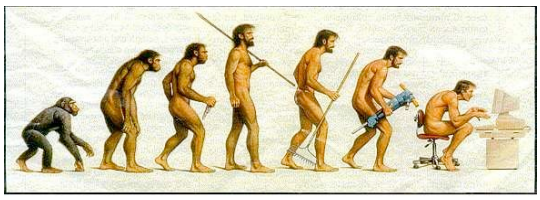
- Factors responsible for pain
- Overactivity
- Poor posture
- "Weak link"

Guarding after an injury is normal

- *"after an injury tissues heal, but muscles learn, they readily develop habits of guarding that outlast the injury"*

Janet Travell, MD

White House Physician,
President John F Kennedy



Somewhere, something went terribly wrong

Hardware vs Software

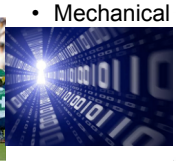
Hardware

- **Orthopedic problem**
- Structural problem
- Injury or

Software

- **Rehabilitation problem**
- Functional problem
- Postural
- Mechanical

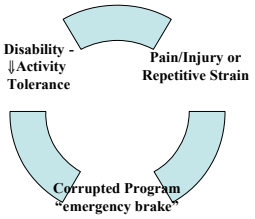





Corrupted Motor Program

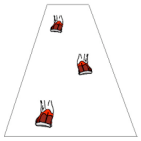
The Corrupted Program:

- **Faulty movement patterns**
- **Poor biomechanics**
- **Is a protective reaction to pain or injury**
- **Is memorized as a new motor program & becomes a habit!**



Corrupted Motor Program - altered biomechanics

- Poor posture
- Faulty movement patterns

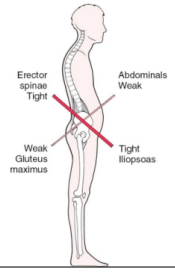

GOALS OF CARE

Improve biomechanics!

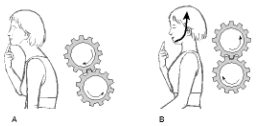
- Postural Correction
- Core Activation
- Breathing Re-education & Flexibility Training
- Independent Functioning

Goal: Correct your Posture

- Poor posture strains joints and overloads muscles



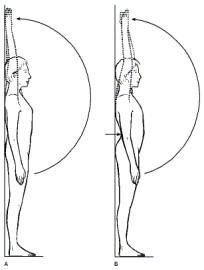
- Correcting posture re-aligns
- Correcting posture is the first step in injury prevention, recovery & performance enhancement



Goal: Postural Correction

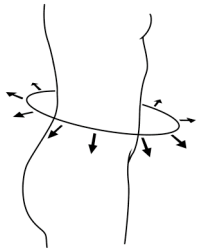
A Posture Test

- Can the arms be brough overhead so that the back of the hands touch the wall?
- Can the back be prevented from arching away from the wall?
- Is it painful?



Goal: Activate your core

- Core muscles provide support & stability
- They help prevent injury
- They aid recovery & rehab
- And, they enhance performance

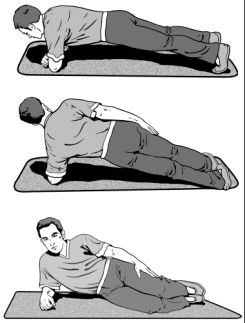


The core provides a 360º ring of support

Goal: Activate your core

A Core Test

- Perform a plank
- With only toes & forearms on the floor
- Can this position be held for 60 seconds?
- Try a front plank
- Try side planks
- Is it painful?



Husk vs Core

Husk/Shell

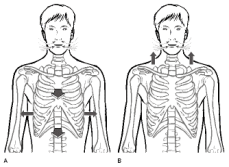
- Outer Superficial Muscles (e.g. shoulder shruggers, chin pokers, jaw clenchers)
- Compensate
- Guard/Protect
- Emergency Brake
- Limit Mobility
- Increase Stress/Tension/Pain

Deep Core

- Inner Muscles (e.g. shoulder depressors, pelvic floor, gluteals)
- Stabilizers
- Guide movement

Goal: Re-educate Breathing

- Breathing with the chest & shoulders in a vertical direction is a common error
  - ⇑'es shoulder/neck tension
  - Disables the core



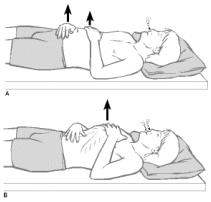
Standing or Sitting Breathing Test

- During a breath in do the shoulders rise up
- Ideally breathing occurs horizontally not vertically

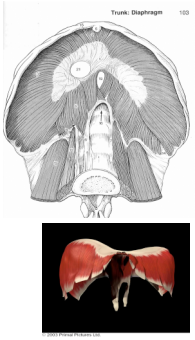
Goal: Re-educate Breathing

A Breathing Test:

- Patient lies supine & see if the abdomen or chest rises more during inhalation
- Ideally, the abdomen would rise more

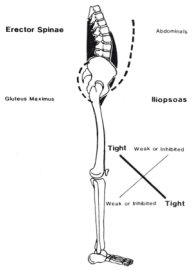


- Diaphragm
  - Sternal: arises from xyphoid process
  - Costal: arises from ribs 7-12; *slips interdigitate with TA*
  - Vertebral: Lumbar vertebra 1-4; fibers of the psoas
- 3 compartments
  - Anterior
  - Middle
  - Posterior



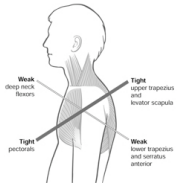
What results from Inspiratory position of thoracic cage (oblique angle of diaphragm)?

- T/L overload
- Hyperlordosis
- Poor centration of spinal joints
- Imbalanced activation of abdominal wall & core muscle groups
- > Lower Cross Syndrome (Janda)

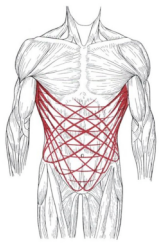


What else results from Inspiratory position of thoracic cage

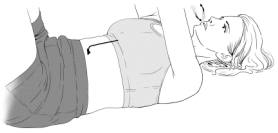
- Anterior carriage (possibly hidden through compensation)
- Shoulder weakness/ instability
  - Lack of anterior serratus fixed point
- Tight pectorals, upper trapezius & levator scapulae
- > Upper Crossed Syndrome (Janda)



Why does depression of thoracic cage matter in both phases of breathing?



Dying Bugs – p627



Goal: Flexibility training

- Tight muscles lead to muscle imbalances & poorly compensated movement patterns
- With good flexibility then upright posture can be maintained during normal activities such as:
  - Standing
  - Squats
  - Lunges

Flexibility: lunge stretch

Goal: Flexibility training

A Flexibility Test:

- Check the squat
- Is the chest arched up in front?
- Is the head over the knees?
- Are the knees prevented from passing in front of the toes?

Goal: Flexibility training

A Flexibility Test (cont'd):

- Do the knees collapse inwards?

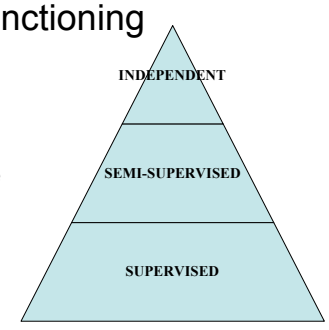
Goal: Flexibility training

A Flexibility Test:

- Assess the kneeling lunge
- Can the patient reach overhead so the arms are vertical?
- Can the patient lean forward in the hip without the knee pressing forward of the toes?
- Can a stretch be felt in the front of the hip on the back leg?

Goal: Independent Functioning

- Our goal is to return the patient to their activities as soon as possible
- The physician is the guide through this process



W.H.O. Paradigm

1. **Participation**
2. **Disability**
3. Impairments ("weak link")

FITNESS FACTORS

Traditional

- Strength
- Flexibility
- Cardio-vascular

Functional

- Agility
- Balance
- Coordination
- Speed
- Endurance
- Relaxation

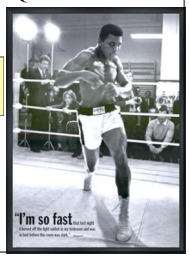
Which is the athlete?

Bodybuilding (cosmetics) vs. Athletics

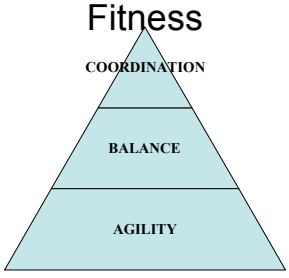
Big & Strong

$$\text{Power} = \frac{\text{Force x Distance}}{\text{Time}}$$

Quick & Powerful



FUNdamental ABC's of Fitness

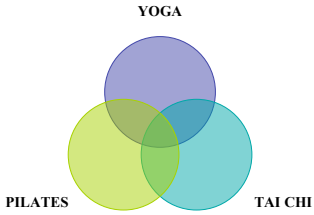


Aristotle

- "Practice doesn't make perfect, it makes permanent"
- Quality NOT Quantity is our goal

"Start by doing what's necessary, then do what's possible, and suddenly you are doing the impossible."
-St. Francis of Assisi

Core Fitness Philosophies



Functional Approach - Biomechanics

- Holistic approach
- Patient-centered care
- Return patients to their recreational, home & work activities as soon & safely as possible
- Identify & train the "weak link"

Functional Approach - Biomechanics

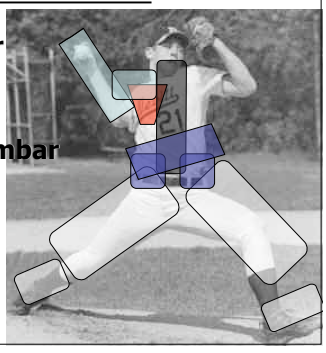
Arm and Shoulder

Scapula

Thoracic and Lumbar Spine

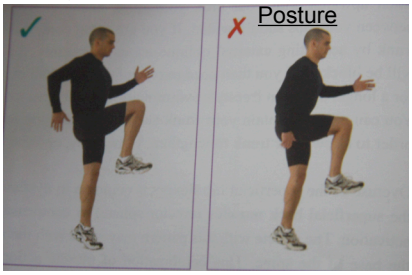
Hips and Pelvis

Legs and Feet



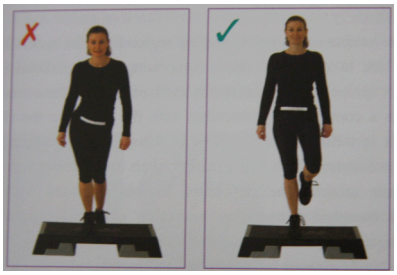
Faulty Biomechanical Movement Pattern - Running

Ideal Upright Mechanics Faulty Slouched Posture



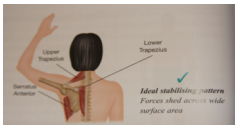
Faulty Biomechanical Movement Pattern - Stepping

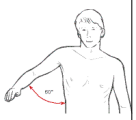
Faulty Pelvic Unleveling Ideal Posture



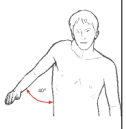
Faulty Biomechanical Movement Pattern - Reaching

- Ideal arm raising w/ shoulder relaxed





- Poor pattern due to shrugging the shoulder up



THE ATHLETIC POSTURE

- Chin in
- Chest up
- Shoulders relaxed
- Knees over toes
- This posture protects you against injury & enhances athletic performance

WHAT PATIENT'S CAN EXPECT

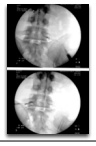
- Orthopedic & Functional Evaluation
- Individualized Self-Care Prescription
- Collaberation with MDs, Trainers, etc



Evaluation

Orthopedic

- Initial
- Rule out Serious or Sinister problem requiring medical/surgical intervention



Functional

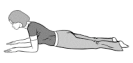
- After Ortho assessment
- Biomechanical Predisposing or Perpetuating factors

Roadmap of Care - *The 1st Visit*

- **Orthopedic Dx** – site of pain
- **Functional Dx** – source of pain
- **Map of Problem** – What makes you hurt



- **Goal:** find the Compass – **Customize** the program.
- Simple, light exercise to nourish tissue

Phase One of Care

- PHASE 1 – Approx 1 month - 3X/week to start
- GOAL: Increase Function/Reduce Pain/Increase Activities

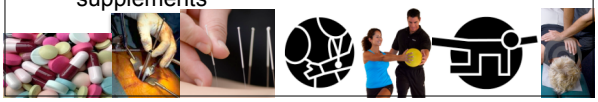

- SUCCESS: 80% of people are 50-80% improved

Phase Two of Care

- 1:1 Preventive & Functional Training
- Soft Tissue Work
- Diminishing frequency
- More self-care
- Return to activities

Synergy

- MD – Medication/Tests
- ORTHO – Medication/Tests/Injections/Surgery
- ACUPUNCTURE
- PSYCHOLOGICAL COUNSELING - Relaxation
- OTHER – Massage/Personal Training
- LASS – Physical therapy, manual therapy, fitness training, soft tissue work, nutrition-supplements



What is Learned on Day 1

- Site of pain
  - Where it is coming from
- Source or cause of the problem
  - Why it happened
- What will we do
- What the patient should avoid
- What the patient can do
- Prognosis/forecast

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I am always aware of how many things which I taught in my long past have since been proved wrong. The most important attitude is therefore to be constantly aware that what you are doing and teaching now you will have to modify and correct in view of new facts. Thus you must keep an open mind for new knowledge , even if it sometimes shows that what you believed and taught before was wrong."-

Karel Lewit - 1/1/98