

Running Workshop





Lagrange
Titusville Rd
Gold's Gym

Fishkill
Main St
Gold's Gym

Justin Feldman, PT, DPT

- Runner
- Triathlete
- Crew Coach
- Ski Patrol/EMT



John Nunez, PT, DPT

- Runner
- Triathlete
- Soccer Coach



Doctorate in Physical Therapy

- Anatomy & Physiology
- Kinesiology & Biomechanics
- Exercise Science
- Treating and Preventing Injury
- Repetitive Overuse
- MSK Joint Assessment
- Movement Screenings

Competitive Athletes

Injuries!!!!

- * Race season is over:
What now?!?
- * Improving performance:
Proper Strength Training
- * Common training mistakes:
What can you do to avoid?
- * Understanding your body:
What is it trying to tell you?



Special Interests

- Core training
- Run/Endurance specific Strength & Conditioning
- Improving performance without increasing risk of injury
- Leg health – ankle, knee, hip and everything in between
- Triathlete interests and tri-specific running

Race Season is over....




Give yourself some time to rest



Running is tough!



- Initial Contact – Foot strike/heel strike
- Over 200% increase in the force transmitted as compared to walking or a non-load bearing activity
- Running vs cycling
- Running vs swimming
- Running vs hiking

- 
- **Rectus femoris** contracts
 - Controls height of the center of gravity
 - Resists excess knee flexion
 - **Hamstrings** act as hip extensors
 - Stability of hip
 - Adductor magnus
 - Tensor fascia lata
 - Energy absorption/weight acceptance
 - Key function of lower extremity (LE)

GRF may reach 2.2 x body weight

- Walking GRF 1.1 x body weight

So what?

- The goal of rehabilitation is to safely return the runner to the desired level of running. Remember, training errors constitute the most common cause of injuries. A well-planned program prevents injury while benefitting the athlete.
 - American Orthopedic Society for Sports Medicine (AOSSM)
- We're here to talk about designing that well-planned program

OFF SEASON



“What’s that?” ~ Every successful runner

The “off-season”



- A Time to Cross Train
 - Find a new hobby for a couple months...weeks...hours?
 - Unload the joints: Cycling & swimming to decrease the impact
 - Still maintain the cardiovascular fitness
- A Time to Reflect
 - I'm a data junkie – Track your results

Benefits of Cross Training

- Maintain intensity & Volume = no decrease in run fitness
 - 4-6 weeks
- Increase in overall training volume with CT = improved run performance
- Concept of specificity training applies to elite runners
 - More critical at higher levels of performance

“Off-season” Continued

- ...theres that word again.

- Set new goals!!!



- Plan your next race calendar.

Improving Performance



Two -Fold

- Getting Faster
- Preventing Injury

Getting faster

- Strength
- Efficiency
- Power-weight ratio

Lets Talk Weights





Checklist

- Core
- Hips
- Knees
- Ankles
-basically everything from the head down
- But lets get specific

What is the core?



So much more than the 6 pack!





CORE: /kôr/

- *noun*
- **1.** the tough central part of various fruits, containing the seeds.
- **2.** the central or most important part of something.



Seems kind of important!





Anatomical Definition:

- Major muscles included are the pelvic floor muscles, transversus abdominis, multifidus, internal and external obliques, rectus abdominis, erector spinae (sacrospinalis) especially the longissimus thoracis, and the diaphragm. Minor core muscles include the latissimus dorsi, gluteus maximus, and trapezius.



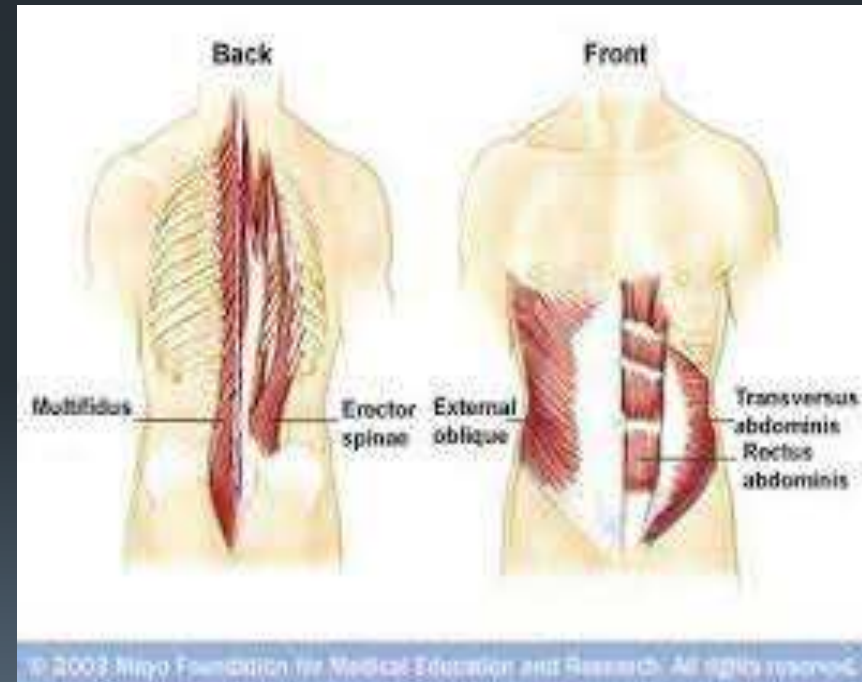
Spine

- House and protect the spinal cord & CNS
- Provide support and a frame for the head and trunk
- Maintain upright
- Provide and facilitate movement
- Shock absorption

Muscles for Stability

“The Core”

- Transverse Abdominis
- Internal Obliques
- External Obliques
- Rectus Abdominis
- Erector Spinae
- Spinal Extensors

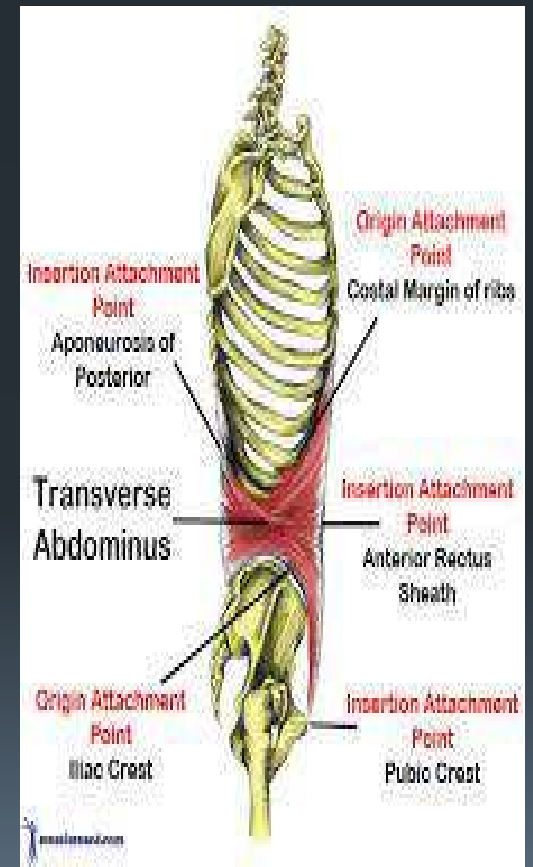
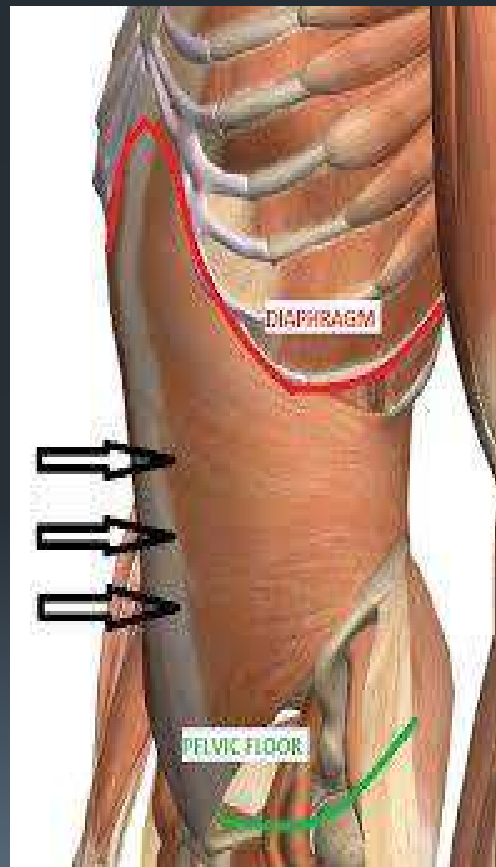
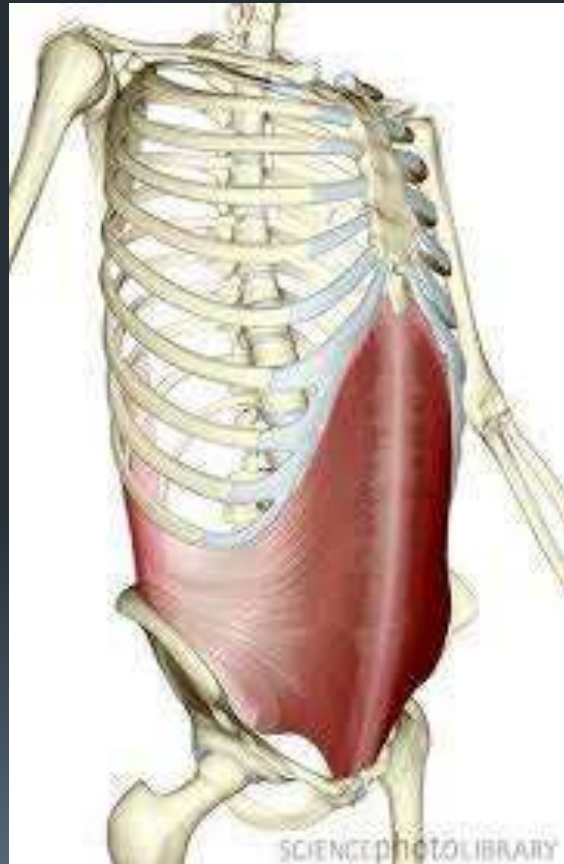




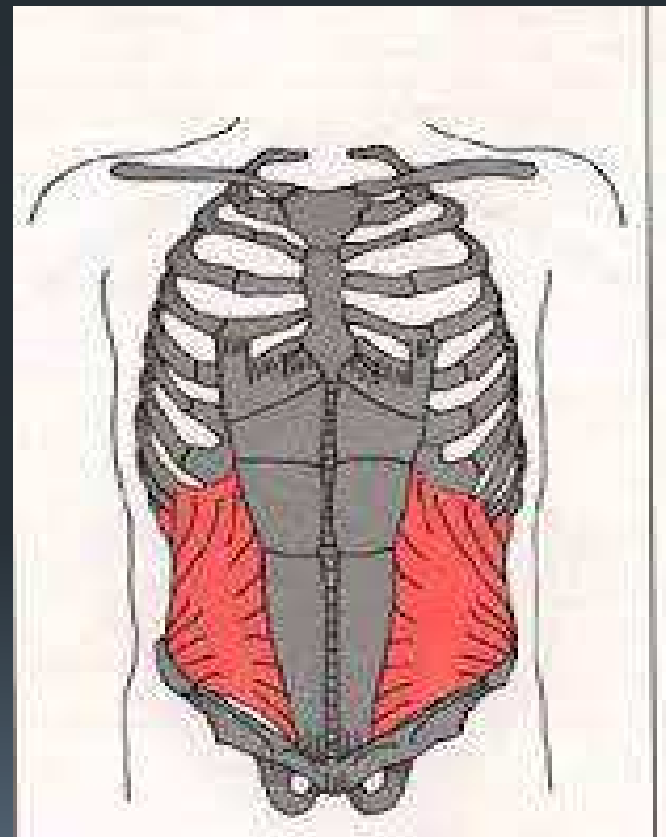
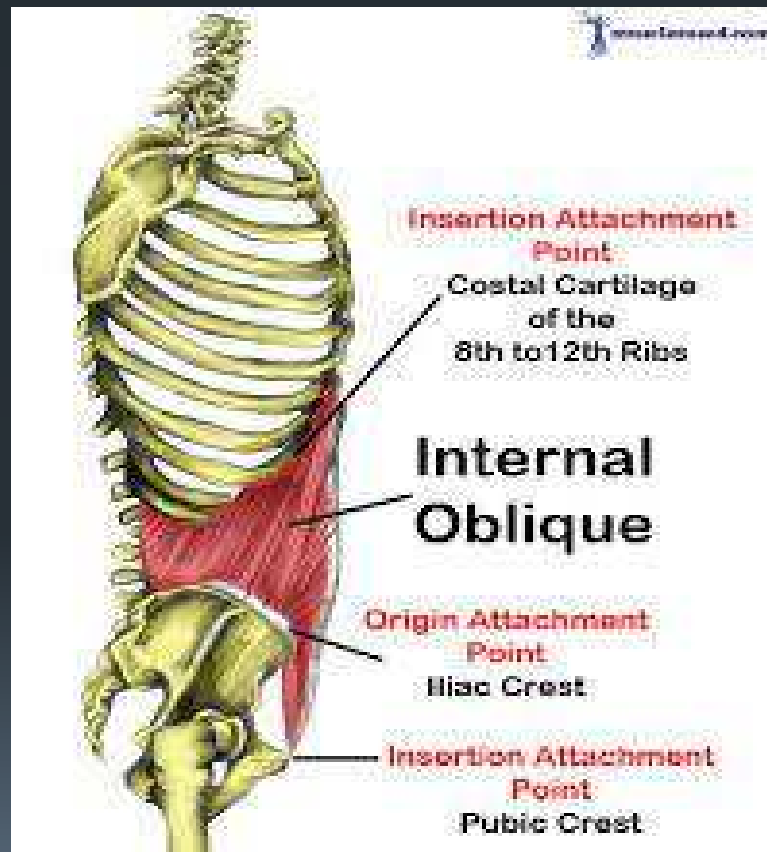
Why?

- Protect and support the spine and pelvis
- Dynamic stability during movement
- Generate and transfer power
- Prevent Injury

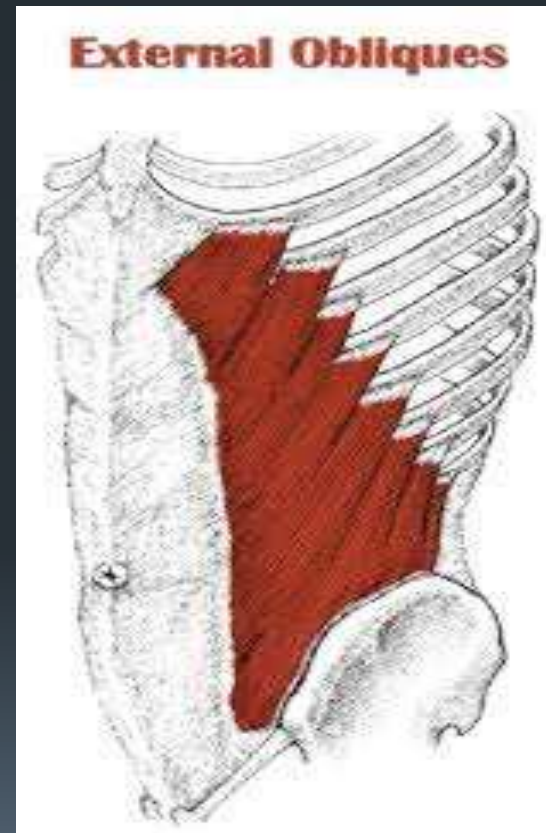
Transverse Abdominis



Internal Oblique



External Oblique



Internals vs Externals

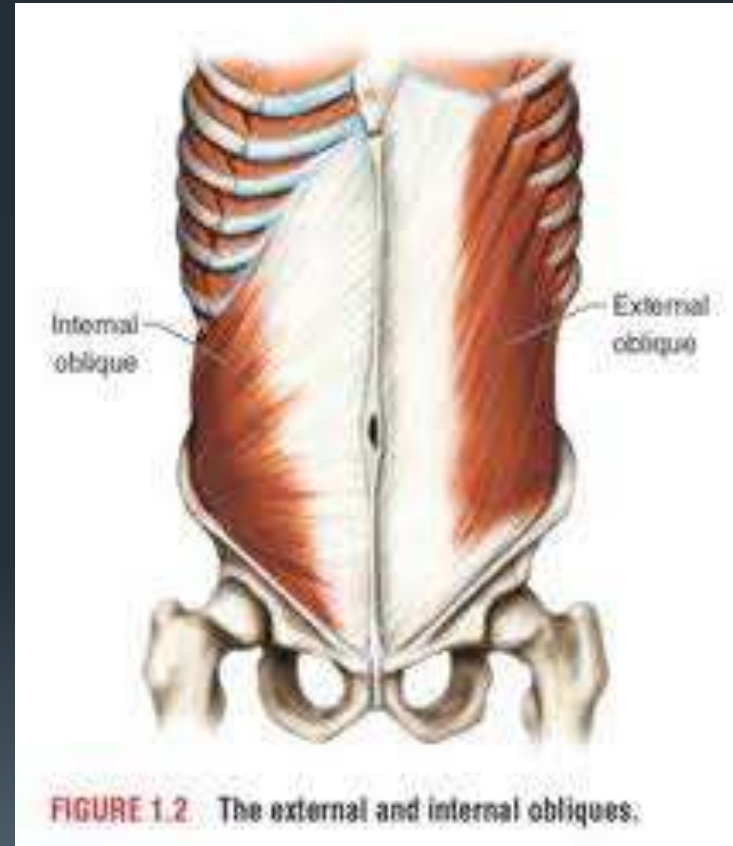
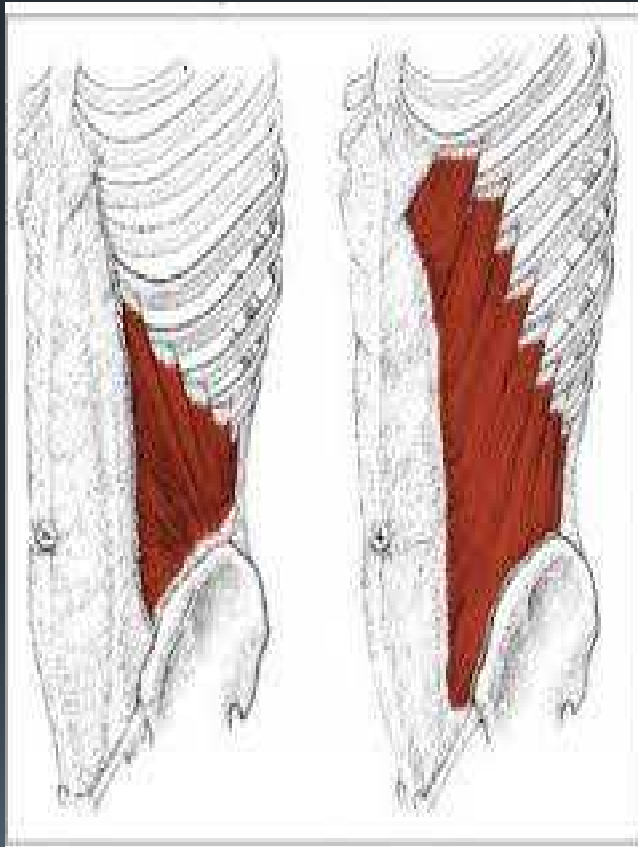


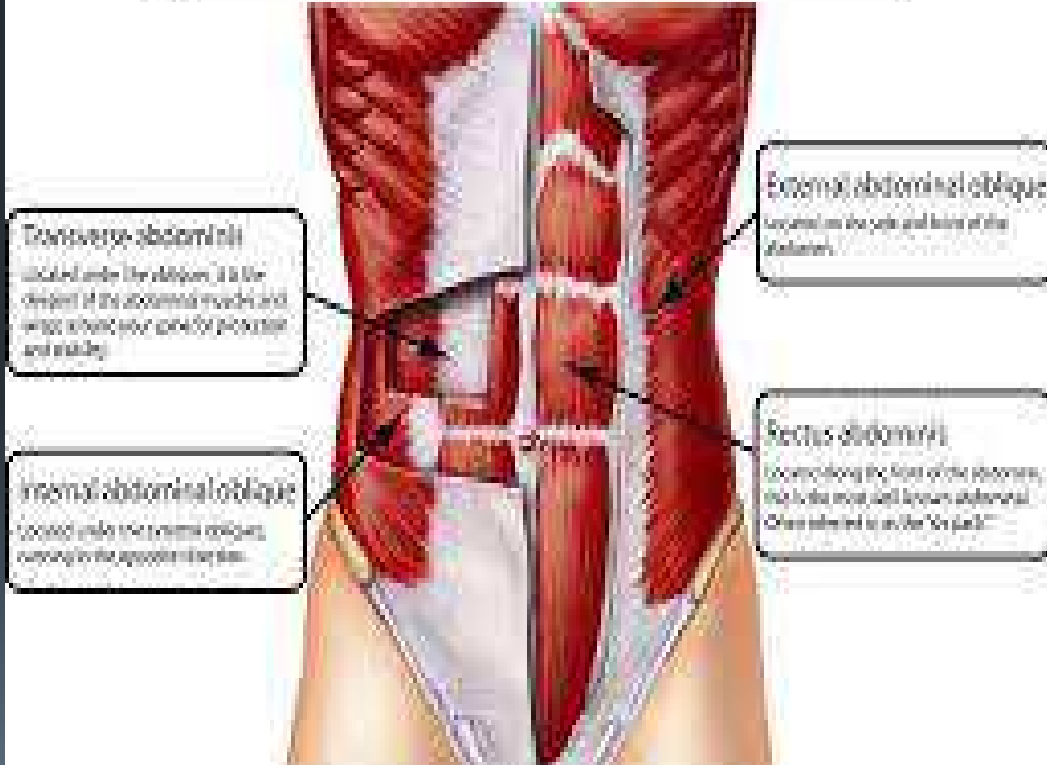
FIGURE 1.2 The external and internal obliques.

Carbon Fiber!

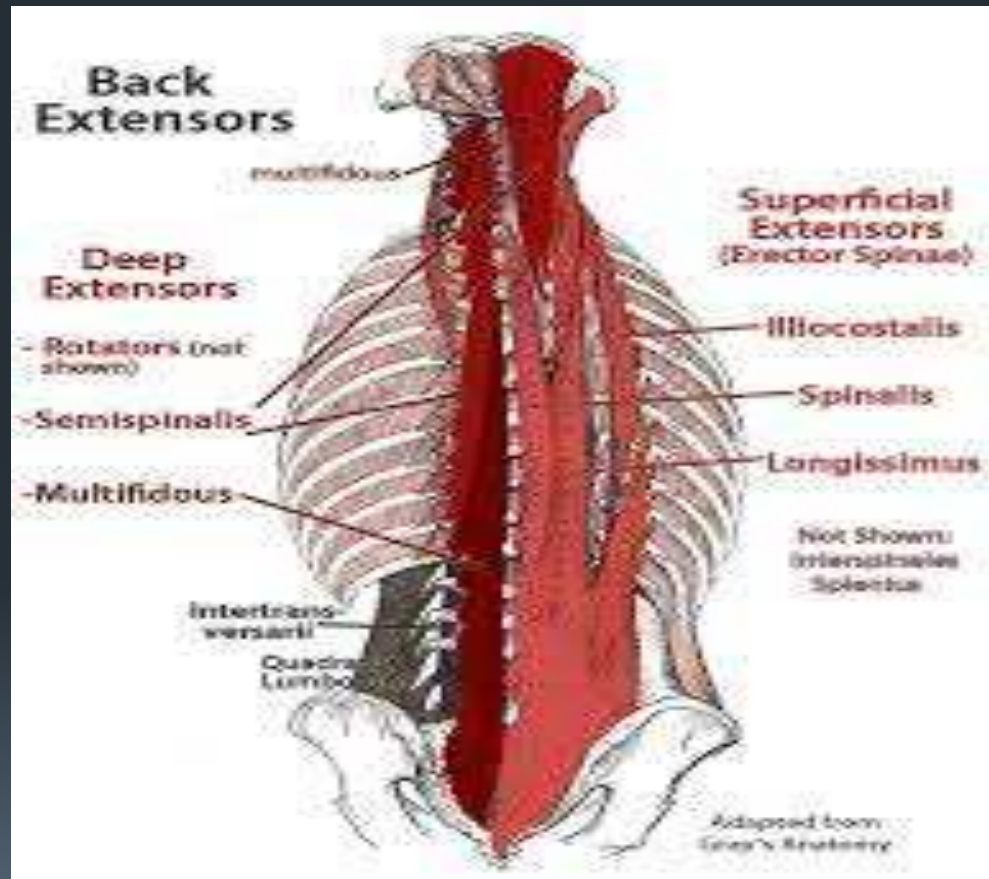


Recipe for success

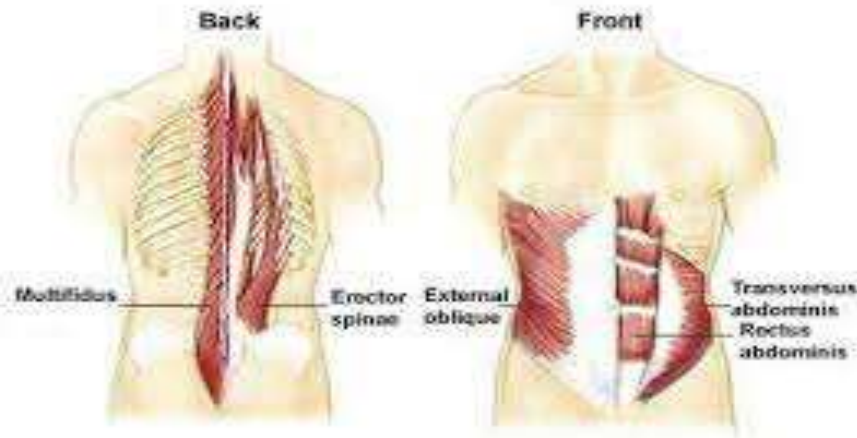
Muscles of the Core



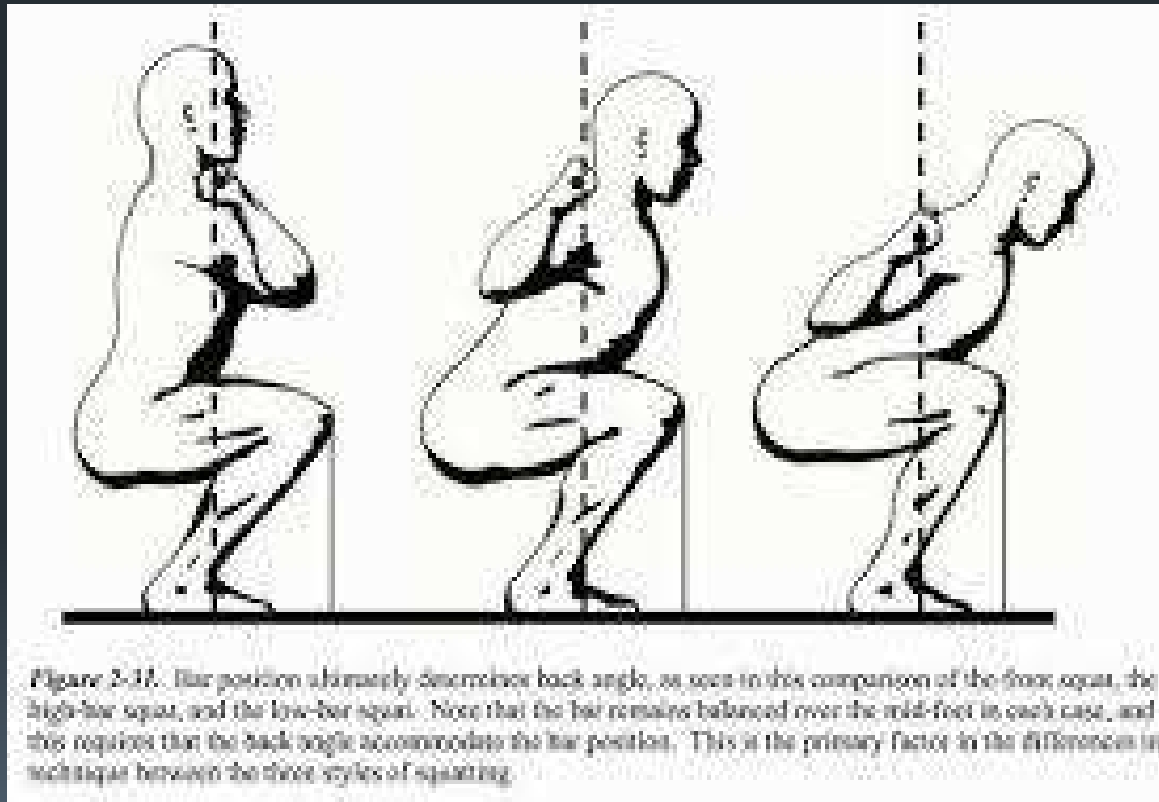
Spinal Extensors



Front and Back

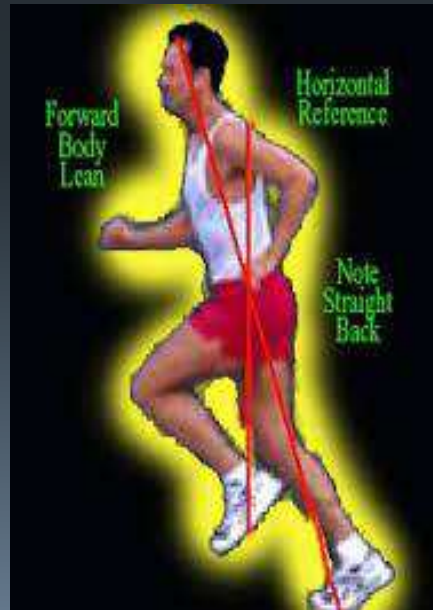



Core for Performance & Power



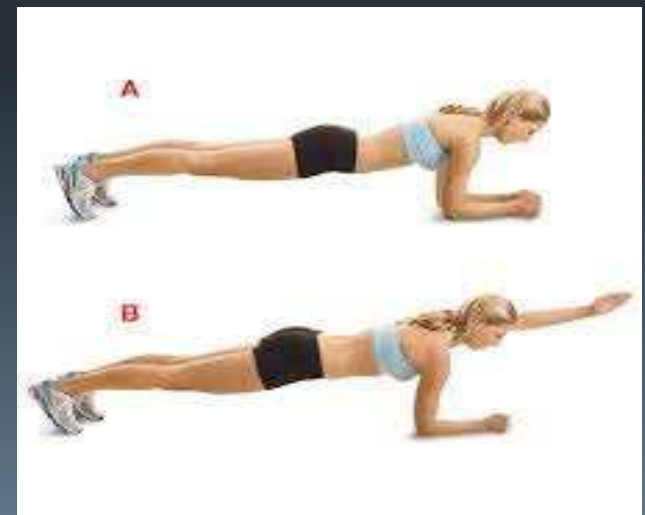


Even “just” running



- 
- Our core is tasked to keep our spine and pelvis stabilized while the rest of our body moves around it.

New Challenges





Why?

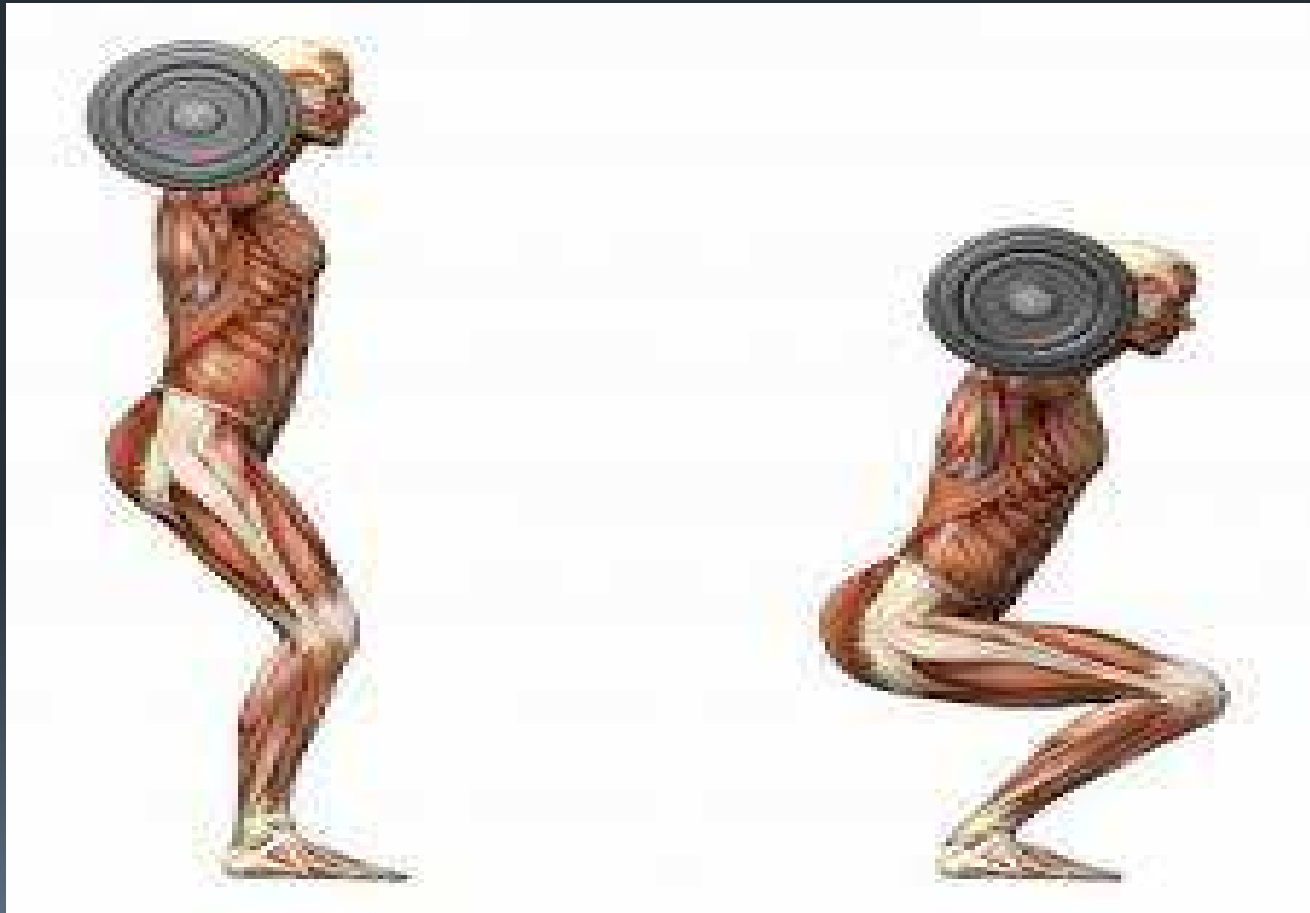
- Protect and support the spine and pelvis
- Dynamic stability during movement
- Generate and transfer power
- Prevent Injury

NIH: 8/10 people with back pain

\$50B/yr on treating LBP



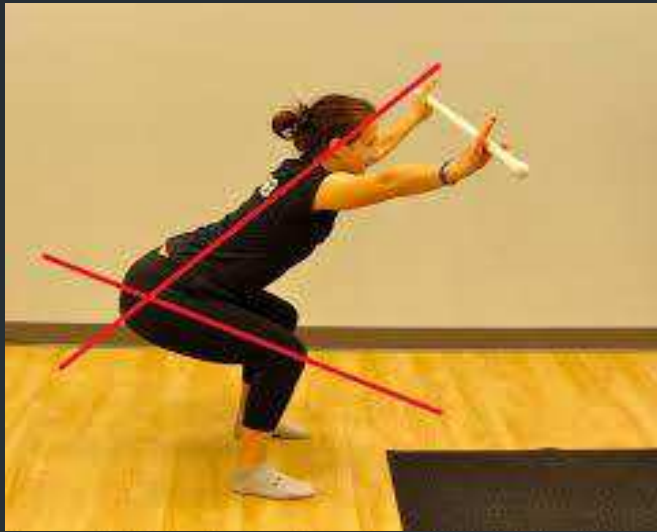
Squats! Squats! Squats!



Core to keep the spine upright



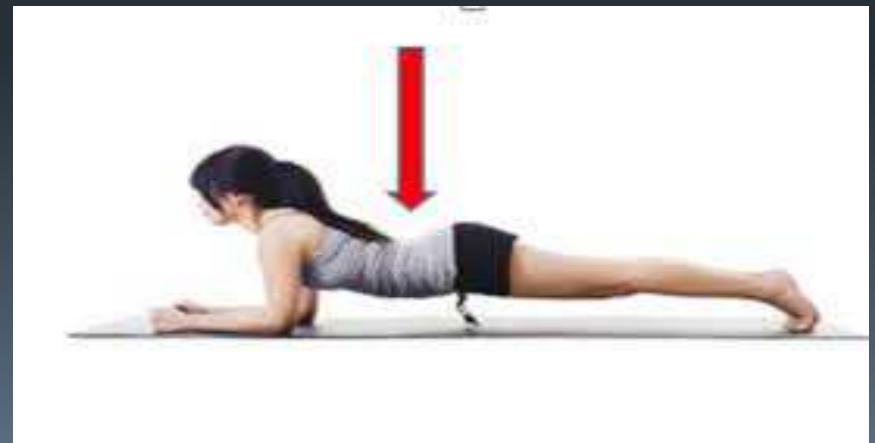
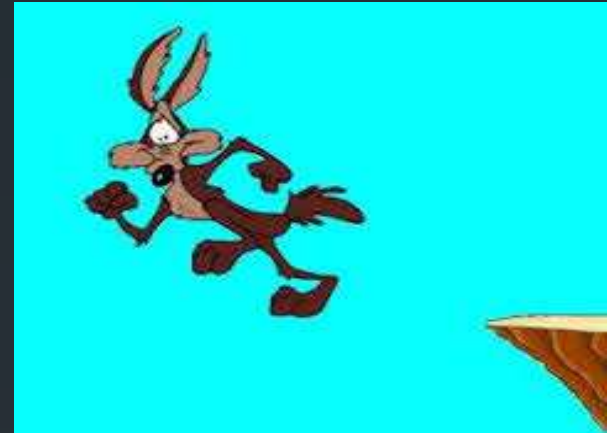
The Difference!



Don't have to be Shredded!



Core to keep the spine level



SO WHAT?

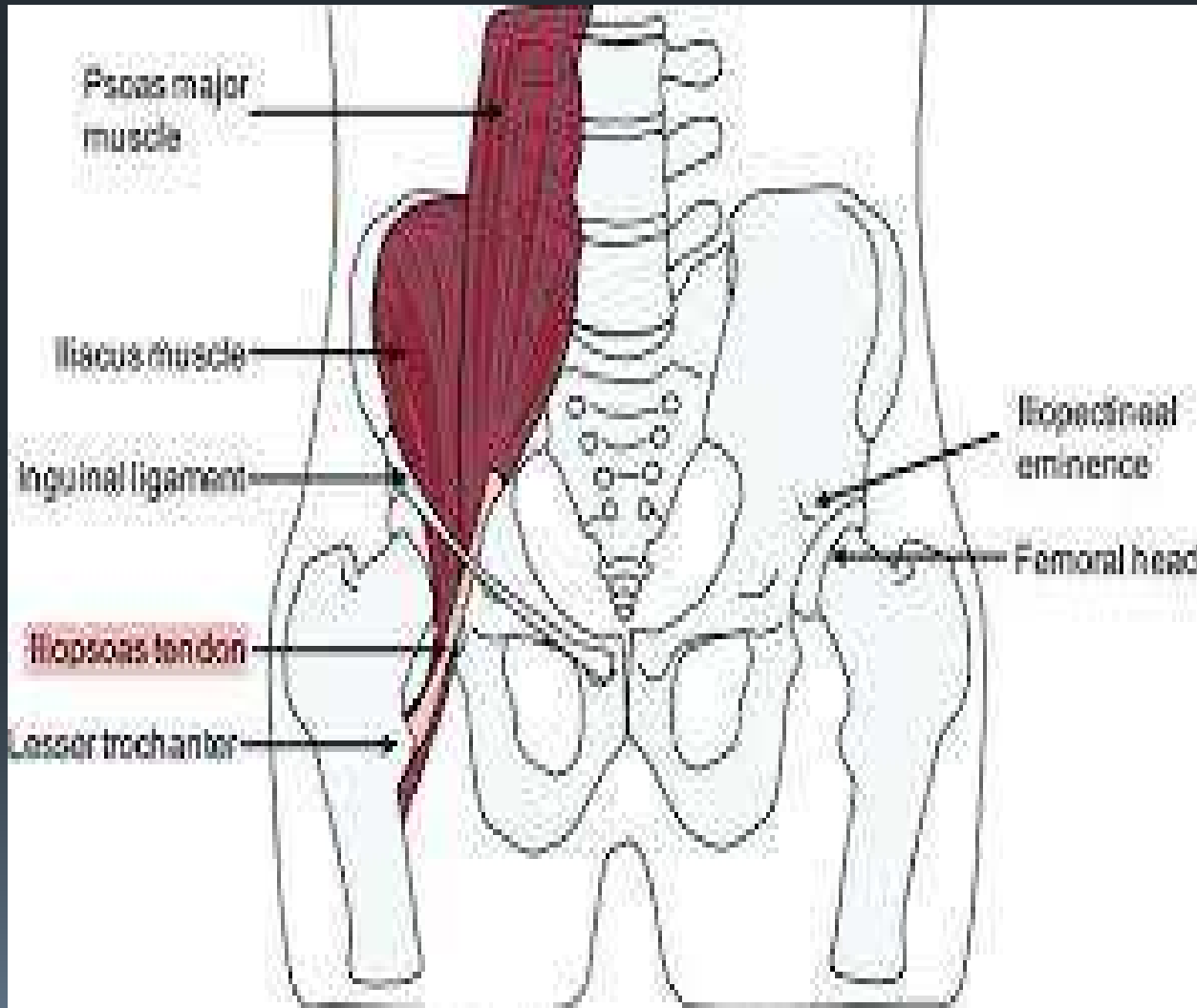


makeameme.org

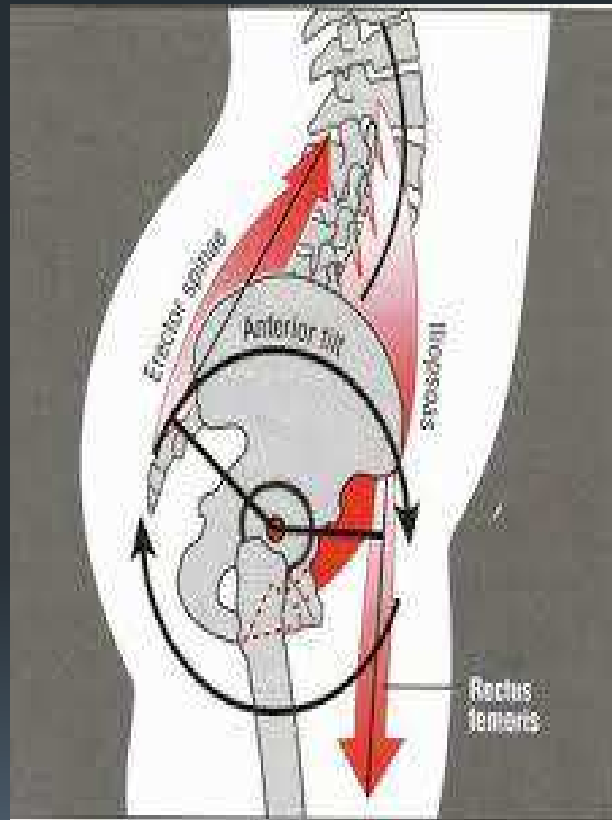
Lower Cross Syndrome



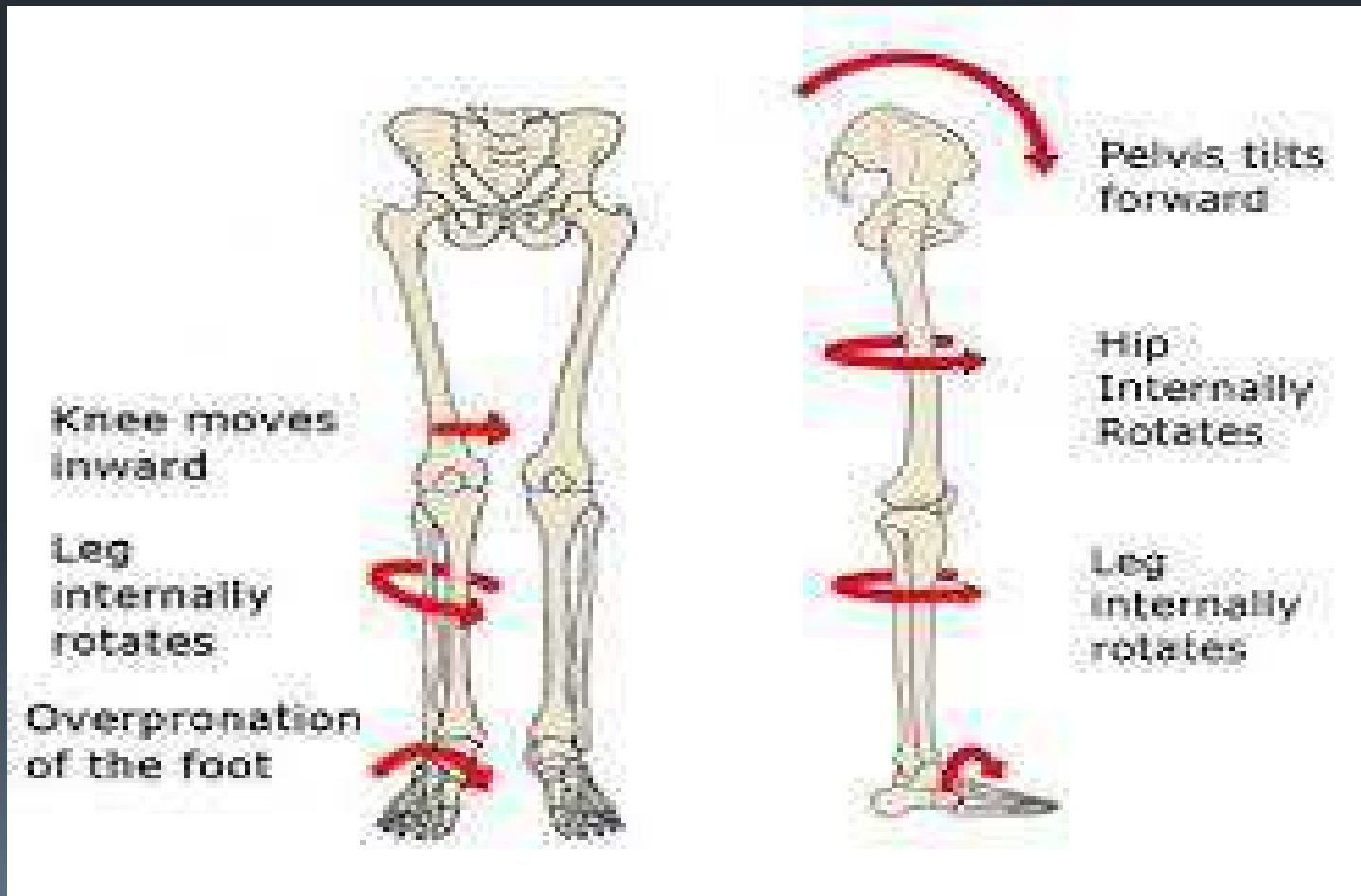
Psoas I was saying...



Anterior Pelvic Tilt



How does it affect the leg?



How do I train my core?

- Have to crawl before you can walk...literally!
- Rolling & Crawling
- Pointers – Bird Dogs
- Rotational Stability



Common Mistakes

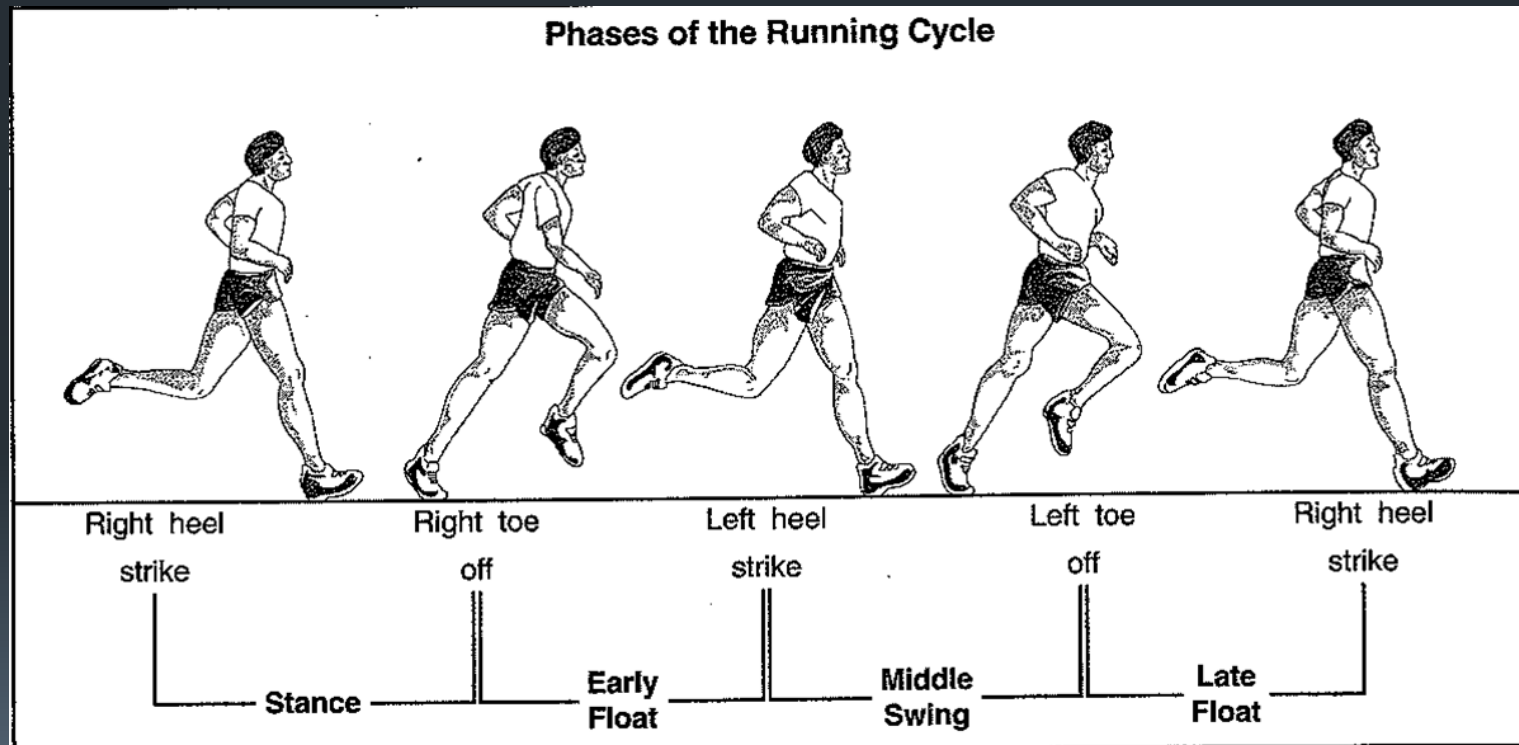
- Hip Flexors
- Lower Extremity (LE) movements



The Lower Extremity!

- Double limb vs single limb
 - Improving strength numbers: Research for double limb
- Running is a series of one-legged hops
 - We want to focus on single limb
- Power vs endurance

Lots of Single Leg Work



Balance



- Proprioception – Receptors in Joints & M-T Jct
- Health of the lower kinetic chain
- Performance of the lower kinetic chain
- Stabilizers vs Movers
 - Dictates how we train them

- Single Leg Balance activities:
 - Barefoot & shod
 - Hard surface & unstable surface
 - Eyes open & eyes closed
 - Static & Dynamic

Strength



- Glutes
- Quads
- Hip Rotators
- Hamstrings
- Calves & Shins

Glute Max & Glute Medius

Hip Extension & Pelvic Stability

- Glute Bridges: Heels close to butt
 - SL & DL
 - With Ball ADD
- Squats
- Dead Lifts
- Lunges
- Banded Walks
- Ball on Wall
- Glute Sequence
- Single Leg Tasks

Quadriceps



- Squats
- VMO and Terminal Knee Extension (a personal favorite)
- Lunges
- Wall Squats
- Horizontal Leg press

Hip Rotators



- Single Leg tasks
- Glute Sequence
- Plyometrics

- Endurance Muscle Group
 - No need for isolation
 - Effective through functional activities to fatigue

Hamstrings

- Bridging: Heels farther away
 - SL & DL
 - On Platform
- SLDL
 - Eccentric Contraction & Concentric
- Standing HS curls

How much?

- Resisted Overload training with true muscle hypertrophy
 - 2-3 days/week per muscle group: YMMV
- Stability and Endurance Muscle Groups
 - Can train 4-5 days a week: YMMV
- Listen to your body
- ACSM

Calves & Shins



- Can train with functional motions
- Plantar Flexion
- Dorsiflexion
- Impt to maintain mobility
- Isolation is more critical post injury

Common Training Mistakes

- *Preventing Injury



AOSSM

- Most injuries occur first 4-6 months of initial running or RTR
- Training Errors:
 - Rapid increase in mileage
 - Rapid increase in hill training
 - Rapid increase in Interval training
 - Inadequate rest between sessions
 - Return to run too prematurely after an injury
- *****Intensity*****

Other User Errors



- Creating imbalances
 - Reinforcing poor movement patterns
- Overstretching
- Under stretching
- No WU & no CD
- Too random of a training schedule
- Disregarding the warning signs

Most Common Injuries

- Runner's Knee
- PFPS
- Stress Fx
- "Shin Splints"
- Plantar Fasciitis
- Ankle
 - Instability = sprains → impingement
- Tenonopathy
 - ITB, Patellar, Achilles, Proximal/Distal hamstring
- Muscle Strain



Imbalances are a risk factor! (Think L vs R & ms groups)

- When a muscle can't perform it's function properly:
 - Injury
 - Other muscles must make up the slack = vicious cycle
- Ex 1: Weak Core
 - pelvic/spine instability = hip flex/Adductor overuse
- Ex 2: Weak Glute Max
 - Proximal HS muscle recruitment for hip extension
- Ex 3: Weak Glute Medius
 - Dynamic knee valgus force = PFPS or SIJP or ankle pronation or etc.
- Ex 4: Quadriceps
 - VMO vs Vastus Lateralis
 - PFPS

Everything in moderation



Overstretching

- Muscles do 2 things: lengthen & shorten
- Muscles contract in 3 ways: lengthen, shorten or neither
- A short & tight muscle is not a strong muscle
- A long & overstretched muscle is not a strong muscle
- Both are at increased risk for injury: traumatic or overuse
- Laxity and instability is a risk factor
- We need our muscles strong for dynamic stability
- When some people think they need to stretch, they actually should probably strengthen instead
 - That tight feeling is coming from a constant tension because the muscle is too weak
- Hamstrings*

Under stretching

- Muscles need to have extensibility
 - Ability to lengthen and be strong:
Eccentric Contraction
- Injury prevention
- Restore blood flow

Warm Up & Cool Down



- Heart Rate
- Metabolic Rate
- Blood Pressure
- Blood Flow
- Metabolites: Metabolic Waste
- Lactic Acid → And its leftovers
- Healing Process

Too Random



- Not everyone has a degree in exercise science
- Training is about maximizing efficiency
 - NOT: no pain no gain
- There is a time for distance and there is a time for the track
- Online “plans” can be effective but one of 3 things will happen
- How do you train/track progress?
 - No thought, RPE, HR, Pace, distance etc?
- Coach?

What is your body telling you? (Warning Signs)



We are only human...

(Trauma vs overuse)





**Take
home message*

- Get to know your body!
 - Strengths & Weaknesses
 - Attack those weaknesses!!!
- Have concerns? Get a good assessment
 - Take care of your body
- Don't believe everything you read in a magazine or the internet.

Some of the best advice...

- Use too little weight...
- Progress slowly...
- Set goals and reach them!



“It is not, therefore in our workouts that we become better athletes, but in the time between them”



Justin Feldman, PT, DPT



IASTM Technique

Instrument Assisted Soft Tissue Mobilization



John Nunez, PT, DPT



ANY QUESTIONS?

