

Are You *Really* Fit to Ski?

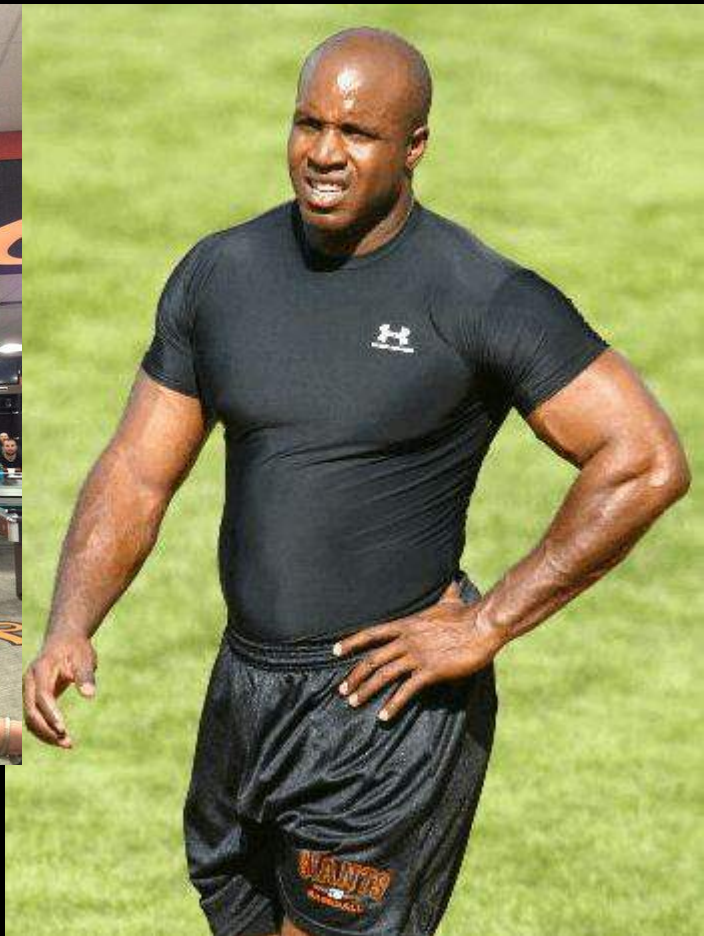
**I've Never Skied, EVER.....**

# The Advantage of Ignorance:

- No preconceived/ dogmatic notions about movement skills and technique and biomechanics.
- Physics are physics, biology is biology.

## **ie Baseball:**

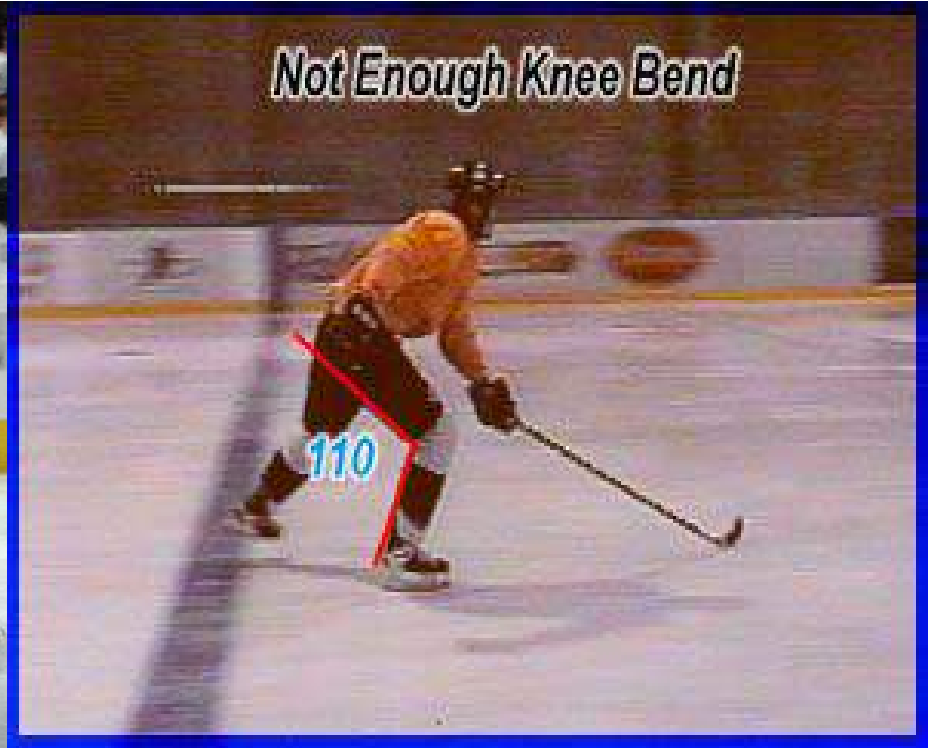
*“You can’t hit a round ball with a round bat if you lift weights”*  
- *Ted Williams*



*“You should ride the bike to get in shape for hockey because hockey is all about the **quads**. They burn towards the end of your shift.”*

- Every coach/ trainer/ guru and advice giver.

# Professional vs Recreational Stride



# **LOWER LIMB MUSCLE RECRUITMENT STRATEGIES DIFFER BETWEEN ELITE AND RECREATIONAL ICE HOCKEY PLAYERS**

Erica Buckeridge<sup>1</sup> , Vinzenz von Tscharner<sup>1</sup> , and Benno M. Nigg<sup>1</sup> Human  
Performance Laboratory, University of Calgary, Calgary, Canada<sup>1</sup>

“This suggests there are ***distinct differences in the way elite and recreational*** hockey players increase their speed on the ice. Expressing PC scores in the original coordinate space revealed ***hip-knee extensor activity to be the dominant strategy in elite level hockey skating.***

Conversely, ***recreational players demonstrated greater reliance on an ankle plantar flexor strategy*** during the latter propulsive portion of the ice contact phase, to achieve a powerful stride”



“Classification and functional *interpretation of muscle coordination is important for athletes and coaches to understand differences in muscle recruitment strategies across skill levels*, and monitor changes that result from training. From this, important coaching implications were revealed: the *determination of the muscles that should be trained, and the identification of strategies that are required, both of which are crucial to skate at the highest level.*”

Could we insert *ski* in place of *skate* in the last sentence?

# **Are your movement abilities/ strategies limiting your technique?**

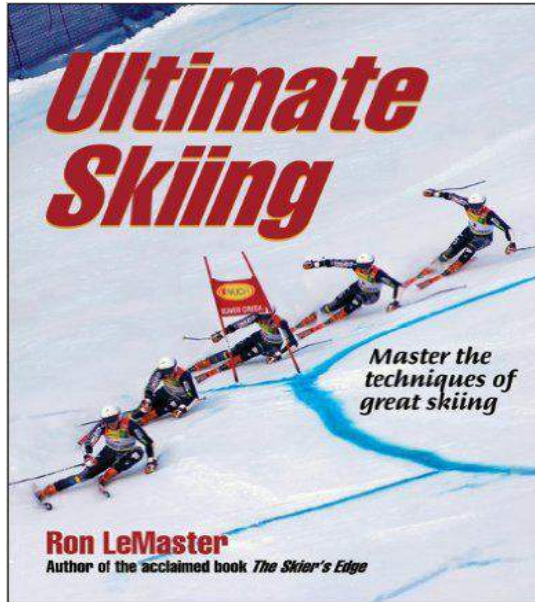
- strength
- mobility
- stability
- motor-patterning

# **INFLUENCE OF MOTOR ABILITIES ON LEARNING OF ALPINE SKI TECHNIQUE**

Vjekoslav Cigrovski<sup>1</sup> , Igor Božić<sup>2</sup> , and Nikola Prlenda<sup>1</sup> <sup>1</sup> Faculty of kinesiology, University of Zagreb, Croatia <sup>2</sup>  
Faculty of Physical Education and Sports, University of Banja Luka, Bosnia and Herzegovina OR

***“Underdevelopment of motor abilities undoubtedly has a certain negative influence on success while acquiring skiing technique elements. Focused exercises not done in ski field can influence development of the motor abilities which are particularly employed while skiing. Moreover, it is possible to influence the significant motor abilities important for skiing by doing specific body activities... Pedagogues, teachers and instructors should know ways and methods for teaching skiing. But when they teach specific ski movements they should respect motor abilities influence on that process. Therefore, recreational skiers or the future ones are recommended to have proper fitness motor preparation before going in ski fields.”***

*“In skiing an effective stance is based on the best alignment of muscles and bones to balance the forces of skiing so that you can remain strong, supple and efficient as you move through turns and variations in terrain and snow.”*



-Ultimate Skiing, Ron Lemaster, pg. 54

# Million Dollar Question(s)?????

Are you, as coaches, teachers of ski technique, *physically* able to demonstrate *quality* skiing?

1. Can you create the necessary joint angles/ body positions?
2. Can you maintain those positions as fatigue sets in?
3. Can you absorb, direct and create force in the appropriate way?
4. Can you replicate all the above through the day...consistently?

*“Is What You Are Doing Enhancing Your Ski Performance or Possibly Hinderling It?”*

-Be Fit to Ski (3), Sue Kramer

**Physical Fitness/ Exercise:** encompasses **ALL** fitness qualities.

- Strength
- Endurance
- Mobility
- Power

**\*GPP:** General physical training that supports sport form. ← gym training that focuses on the most critical physical elements related to proper skiing.

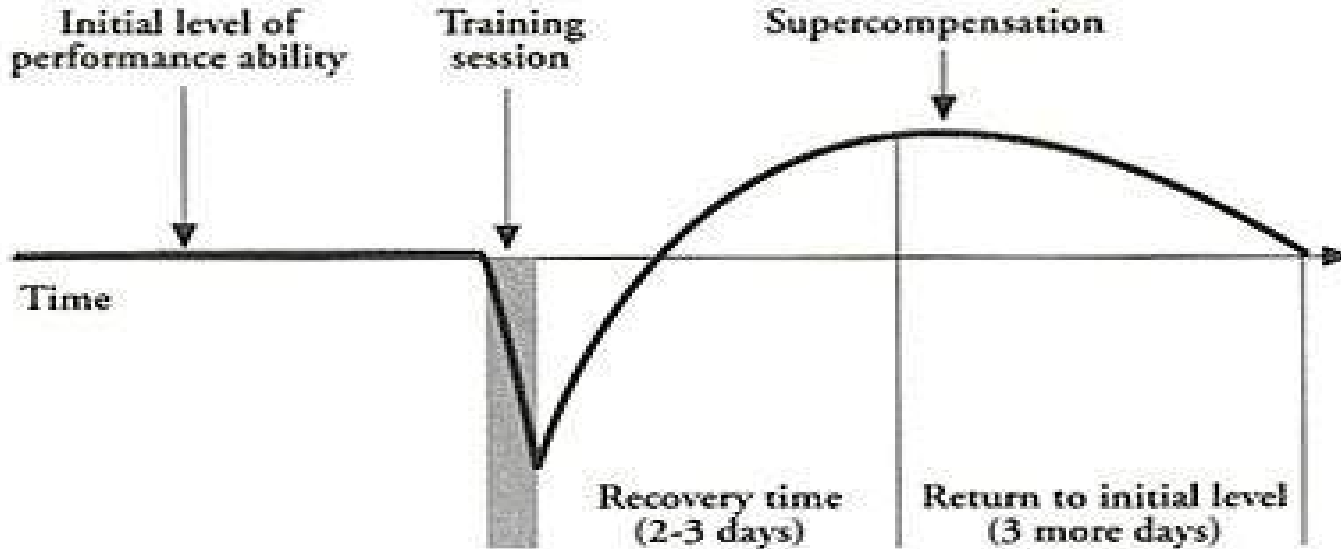
**SPP:** Specific Physical training that enhances sport form. ← ski practice drills, dryland or on the snow.

**Hiking** ← → **Walking Lunge** ← → **Ski Drills**



**Adaptation:** What you do, is what you get.

**GAS model:** Your body adapts/changes to the drug.



*Supercompensation after a training session.*

# Biomechanics 101: Tensegrity Model

No Such Thing as Isolation.

All joints/ muscles react to each other.

All joints and muscles mobile and strong  
for **optimal** movement.



# Balance: It's not Magic.

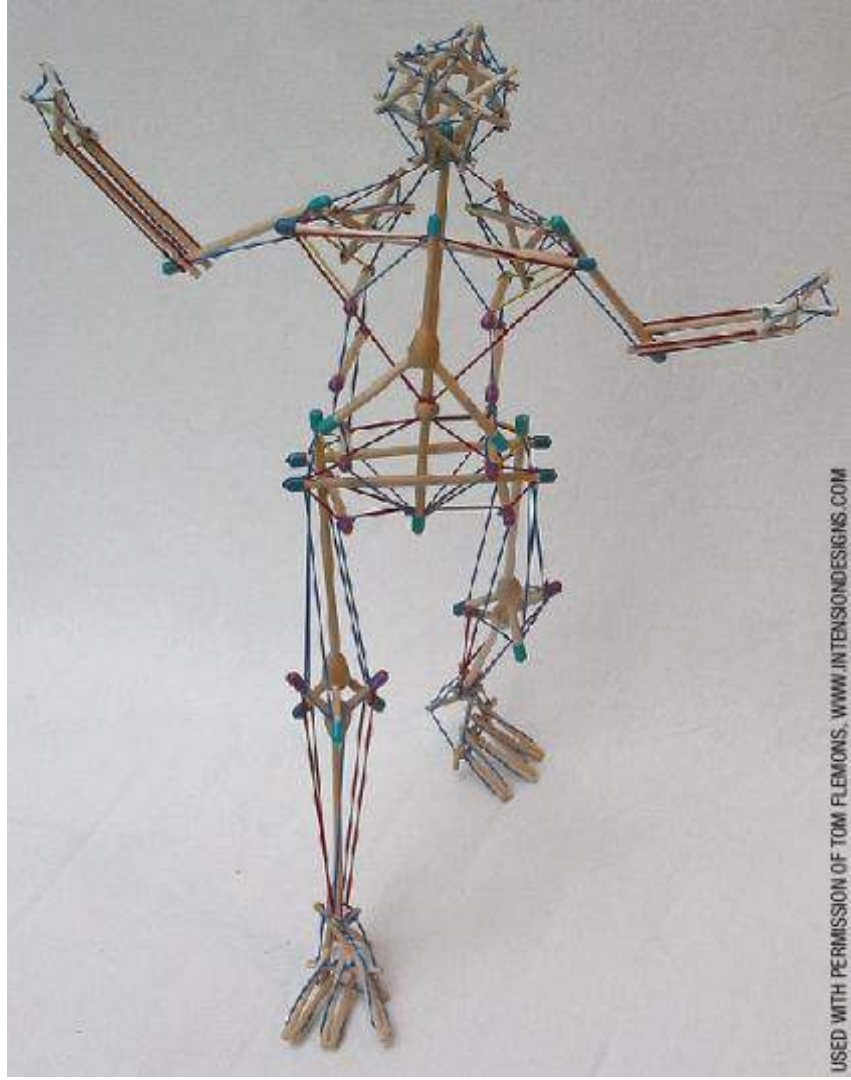
Vestibular (visual): Input/ output

**Muscular Balance = Joint Centration**

Equal pull across the joint.

**Functional Tension applied!**

Joint angle, surface, stress, ie..context specific.



# Functional Movement:

## *Not Ski Specific, Human Specific*

If **you** don't move well as a **HUMAN**, how can you move well as an athlete on a ski slope?

How can you **most** effectively teach, analyze and correct movement?

Why are you wasting your time, energy and money? *ie..equipment and lift tickets ain't cheap.*

# Functional Training: Purpose

- Enhance Mobility and Motor Control
- Improve adaptability
- Improve Durability
- Create a Sound Base for Specialization
- Combat Dysfunction

-Gray Cook

# Training Continuum:

Movement ← → Strength ← → Power

- 1: Mobility
- 2: Stability
- 3: Strength
- 4: Power

# Movement Analysis:

*All* sports create asymmetries, yours is not different!

As these asymmetries develop they will strengthen and solidify as you ONLY do the sport itself.

If you don't work on your weaknesses and bring your body into balance eventually you'll break:

***“Shooting a cannonball out of a canoe”***

# FMS: It's not the end-all, be-all. But it's a good start.

*“Put simply, the FMS is a ranking and grading system that documents movement patterns that are key to normal function. By screening these patterns, the FMS readily identifies functional limitations and asymmetries. These are issues that can reduce the effects of functional training and physical conditioning and distort body awareness.”* - <http://www.functionalmovement.com/fms>

- Mobility
- Stability
- Common Imbalances/ Compensation Patterns.





# Why I'm Not FMS Certified:

*“I’ve seen athletes pass the FMS with great scores but **things suddenly change when you add a “LOAD” or you mechanically stress them.** IF you watch your athletes move and train, you correct them and make sure things are done properly things correct themselves! That's why I pay attention to detail and coach, that's what we are paid to do.”*

- Buddy Morris

# Mobility: Unrestricted Range of Motion at a Joint

- Not just flexibility .

Mobility describes the joint, flexibility is the stretch in a muscle.

- Tight muscles can inhibit mobility.

But not always tight, usually overactive/ underactive. Unbalanced across the joint.

*Can you achieve the full range of motion available to YOU, before you load the joint?*

# Hip Rocking: Tests Hip Mobility and Socket Depth



## Key Points:

- Arms Straight.
- Chest up.
- Slowly rock back maintaining neutral spine.
- Quadruped position (hands under shoulders, knees under hips).

via: [Bret Contreras.com](http://BretContreras.com)

## Shoulder Flexion:



### Key Points:

- Lie flat or stand against a wall
- Heels, hips, shoulders, head on the floor.
- Reach up, arms straight, overhead until you feel restriction.

*[via: Onnit Academy](#)*

# Squat:

## Key Points:

- Toes can flare up to 15 degrees.
- Neutral Low back
- Chest up (T-shirt logo visible)
- Knees track in line with toes.
- Feet flat and no wider than shoulder width.



*[via: Mens Health](#)*

## Hip Hinge:



### Key Points:

- Maintain neutral spine.
- Shins stay vertical
- Head, upperback and hips stay against the rod.

[Credit: ACE fitness](#)

## Stability: Owning the position.

Do you **own** your movement?

Is the joint position where you intend it to be when you intend it to be there?

Can you maintain that position?

Stability is about **POSITION**, not training small muscles with light weight.

In the right position, the stabilizers turn on automatically!!!!!!

**Tight at a Joint Does not Equal Stable!!!!**

# Inline Lunge Stance:



## Key Points:

- Hip in neutral (belt line flat)
- Ribcage in neutral
- Front foot in line with back knee, back foot in line with back knee.

*[cred: aaronswansonpt.com](http://aaronswansonpt.com)*



# McGill Side Bridge:



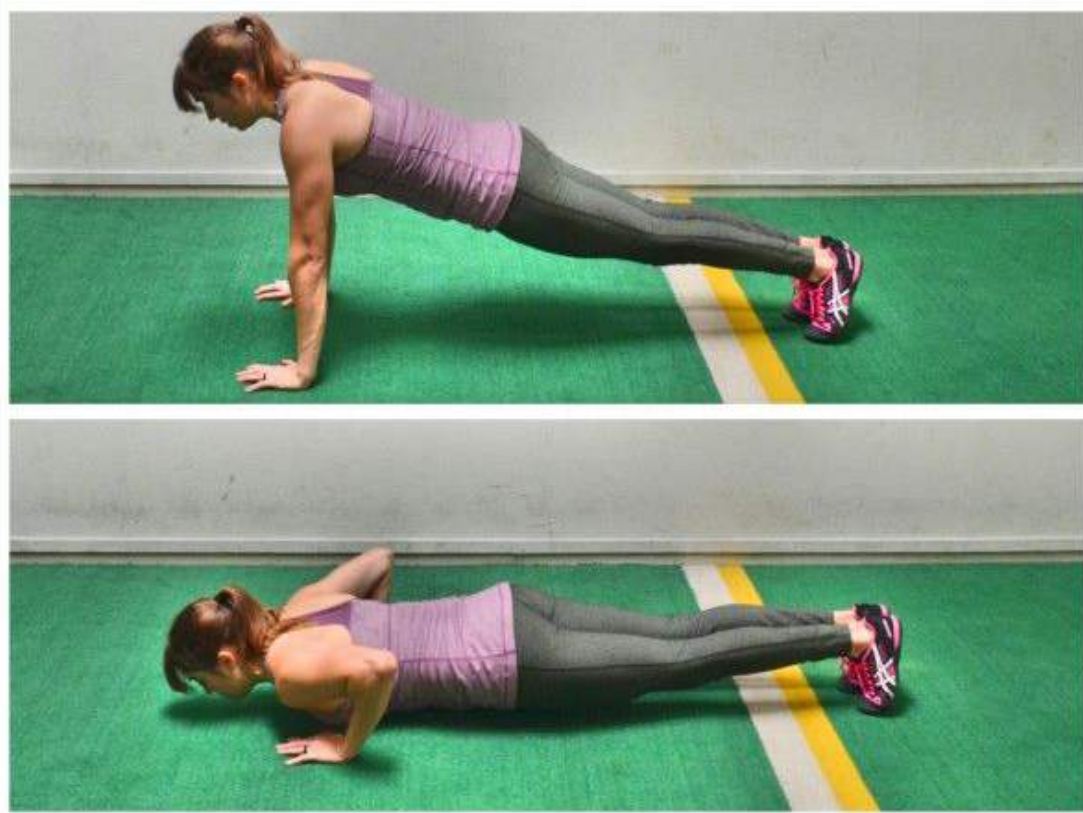
## Key Points:

- Feet split (top foot to the front)
- Hips up in neutral
- ribcage down
- ribcage perpendicular (or close to it) to ground
- 60's passes.

# Dead Stop Pushup:

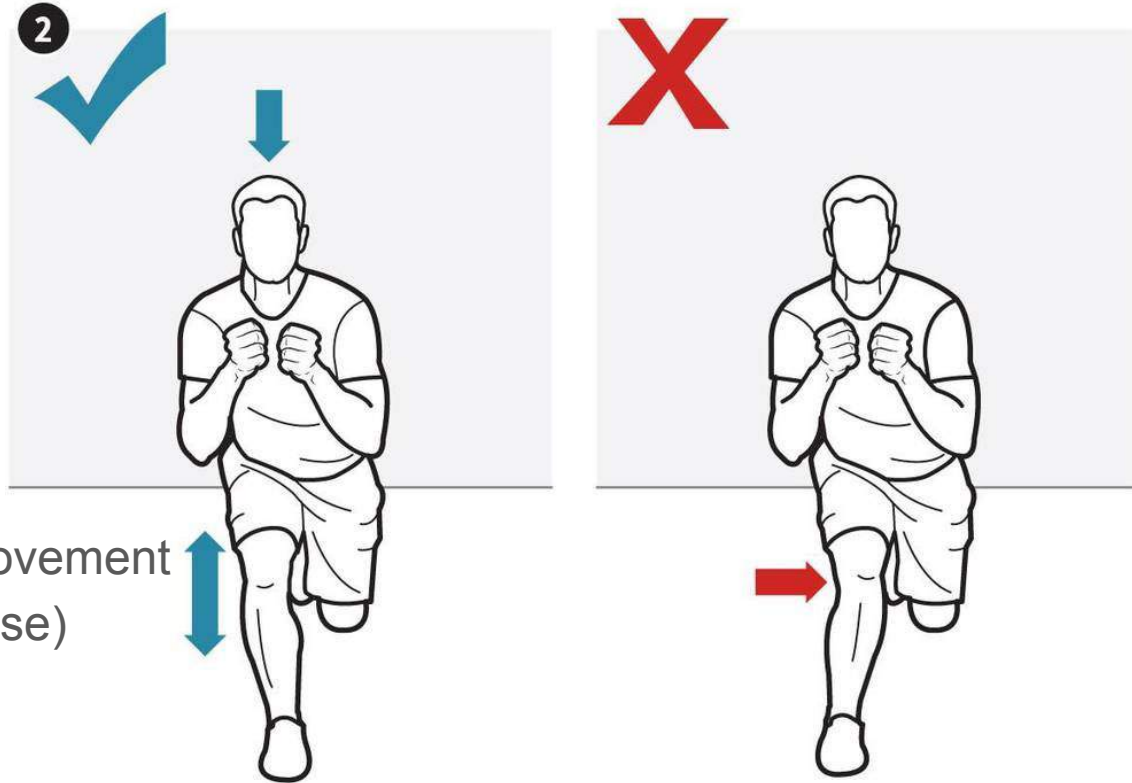
## Key Points:

- Chest flat on the ground
- Hands so the forearm is vertical
- Press through lockout
- Look for hitching, bending or rolling



[via: redefiningstrength.com](https://www.redefiningstrength.com)

# Single Leg Hop Test/ Jump Rope Test (advanced):



## Key Points:

- Smooth Movement/ Countermovement
- Knees stable (no medial collapse)
- Foot Stable (no arch collapse)
- Hip Stable (no rotation, hiking)
- 30 foot contacts passes

*[credit: feldmanperformance.com](http://feldmanperformance.com)*

# Psoas Activation Test:



## Key Points:

- No Leaning or rotating
- Knee passes hip joint
- Loaded Knee remains locked

# Strength/ Imbalance Tests:

- Maximal force a muscle can generate/ absorb.
- Strength is “*loaded stability*” through a range of motion.

# Split Squat:

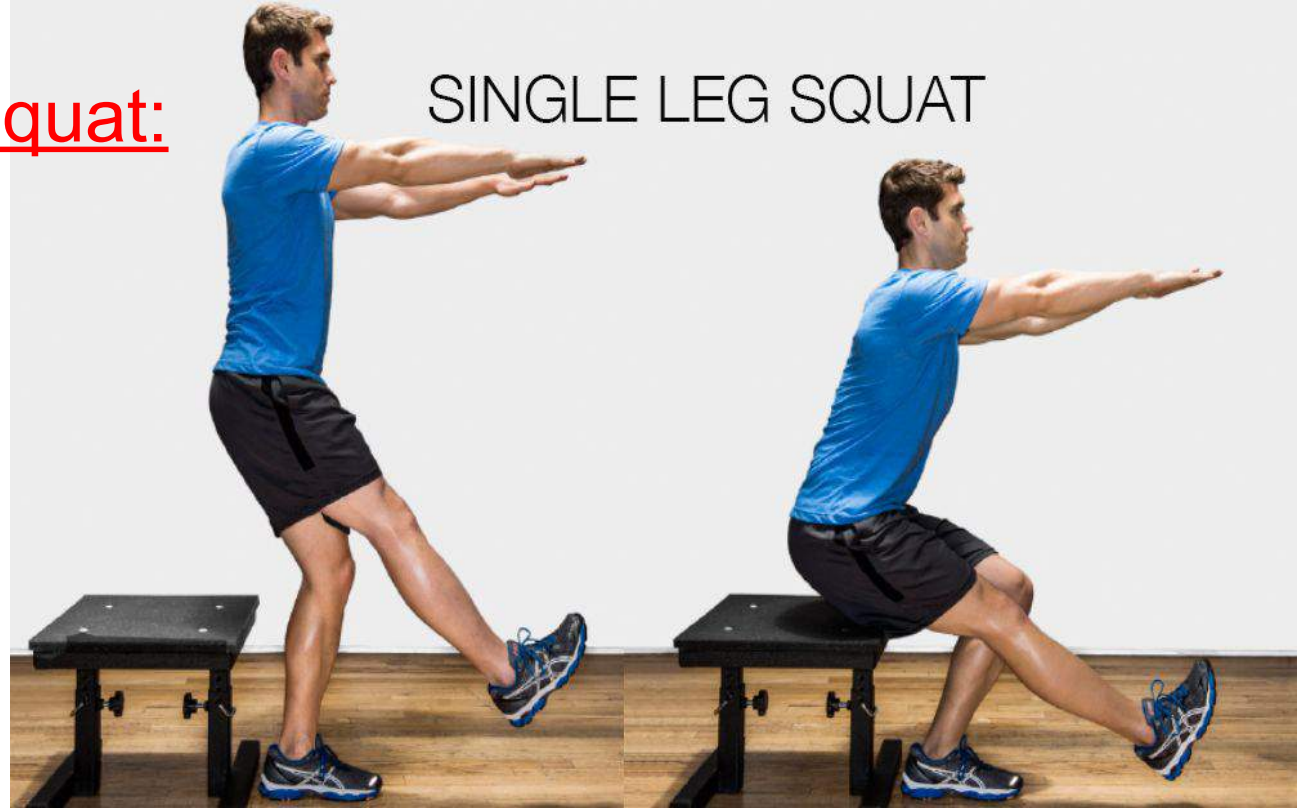
## Key Points:

- Toe, ankle, knee, hip
- Drop the back leg straight down
- Pressure in the front foot midfoot to heel.
- No foot arch or knee collapse
- “Stand” on the front leg, don’t use the back leg as a “kickstand”
- Ribcage remains neutral



## Single Leg Box Squat:

### SINGLE LEG SQUAT



#### Key Points:

- Ankle, knee, hip, line up
- Sit back, not just down
- Full stop, but no unloading on the box
- No arch or knee collapse
- Chest up (low back can round slightly)

# Single Leg DeadLift:

## Key Points:

- Shoulders and hips flat
- No change in torso during the lift
- Motion is at the hip (back, not “over” or down)
- Vertical shin
- No back extension at the top





# Traditional Strength Tests:

- Pushups
- Pullups
- Rows (TRX, Dumbbells)
- Deadlifts
- Squats
- etc, etc, etc

Bilateral exercises better express strength (Fmax) but also cover weaknesses!

That can make them a poor assessment tool for movement qualities.

# Common Imbalances: Desk Jockey Posture

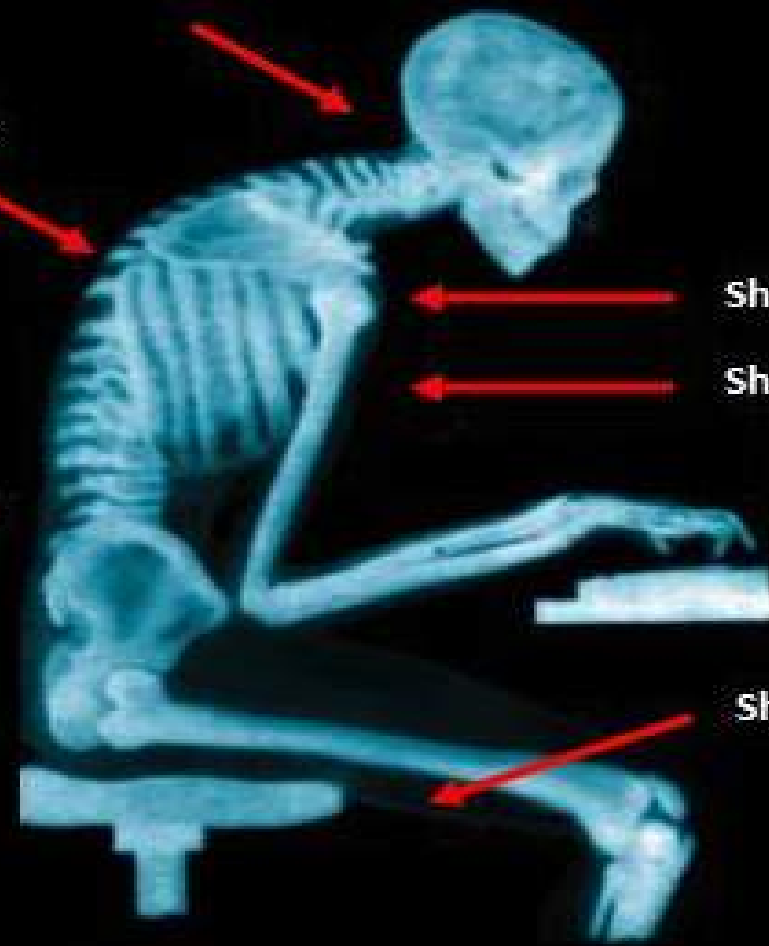
- Tight Hip Flexors
- Overactive Quads
- Underactive/ weak glutes (Extension and External rotation)
- Lack of Thoracic extension/ rotation
- Reliance on low back to initiate movement (twisting)
- Lack of scapula retraction and depression
- Overactive upper traps and chest
- Lack of diaphragmatic breathing.

Forward head posture in cervical spine

Elongated, inactive and weak upper back muscles with T spine curvature

Reduced hip flexion

Elongated, inactive and weak glutes



Shoulder Internal Rotation

Shortened pec muscles

Shortened hamstrings

# Ski Imbalances are the Same!

Skiing is fundamentally a flexion based sport:

*“All of the joints- ankles, knees, hips, and lower back- flex evenly and appropriately together”*

- Alpine Technical Manual, 38



# Concepts over Exercises:

- Tightness/ ***Functional Tension***
- Never train through pain: Train around pain, see a professional!
- Movement over weight
- Add reps and ROM before weight (usually)
- You can never have enough
  - Hips/ Glutes
  - Core
  - Upper/midback
- Posture matters

# Glute Bridge:

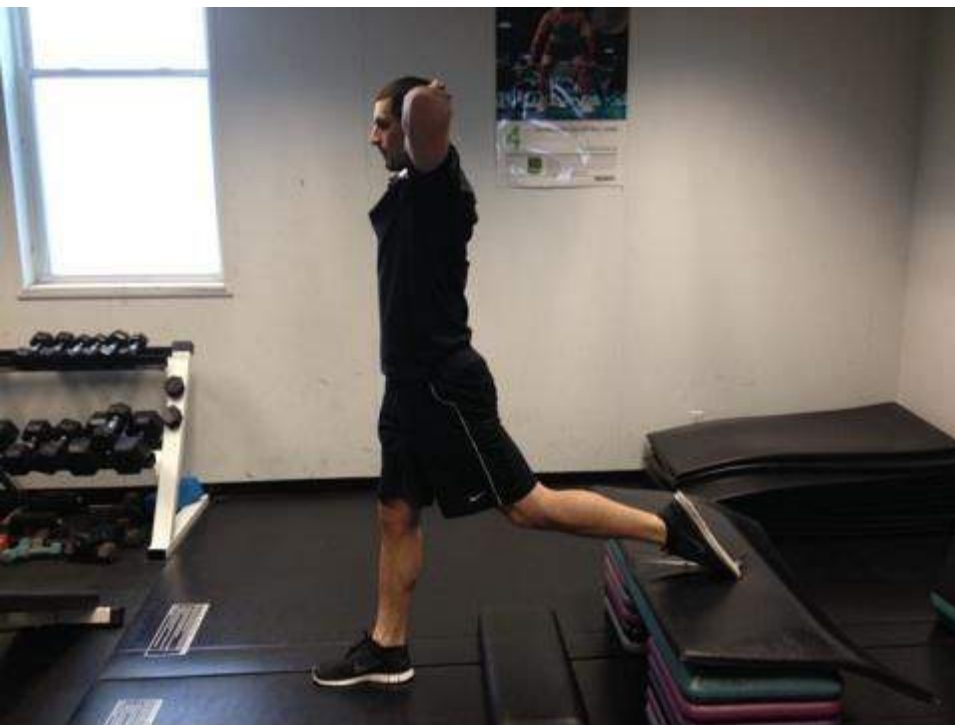


# Mini Band Walks:



[via: watchfit.com](http://watchfit.com)

# BSS/ RFESS:



*credit: justin rivelli*



# Single Leg Dead Lift:



[via: girlsgonestrong.com](http://girlsgonestrong.com)

# Side Lunge:



*experience life*

# McGill Side Plank:



# Power:

Contrary to popular opinion power does not need to be a training focus until the athlete is **very** strong.

*“Improvements in athletic performance were similar in relatively weak individuals exposed to either ballistic power training or heavy strength training for 10 wk. These performance improvements were mediated through neuromuscular adaptations specific to the training stimulus. The ability of strength training to render similar short-term improvements in athletic performance as ballistic power training, coupled with the potential long-term benefits of improved maximal strength, makes **strength training a more effective training modality for relatively weak individual.**”*

- [PRUE CORMIE<sub>1</sub>, MICHAEL R. MCGUIGAN<sub>2,3</sub>, and ROBERT U. NEWTON<sub>1</sub>](#)

# Injury Prevention:

Good Training is **THE** Best Injury Prevention Strategy.

- Most injuries occur when fatigued and motor patterning changes, ie. “*self preservation*” strategies.

The more force you can absorb the better chance you have of limiting tissue deformation.

ACL prevention is not about quads...hips, hips hips. Femoral control is paramount to preventing ACL, and all knee ligament injuries.

# There are NO Special Exercises!!!!

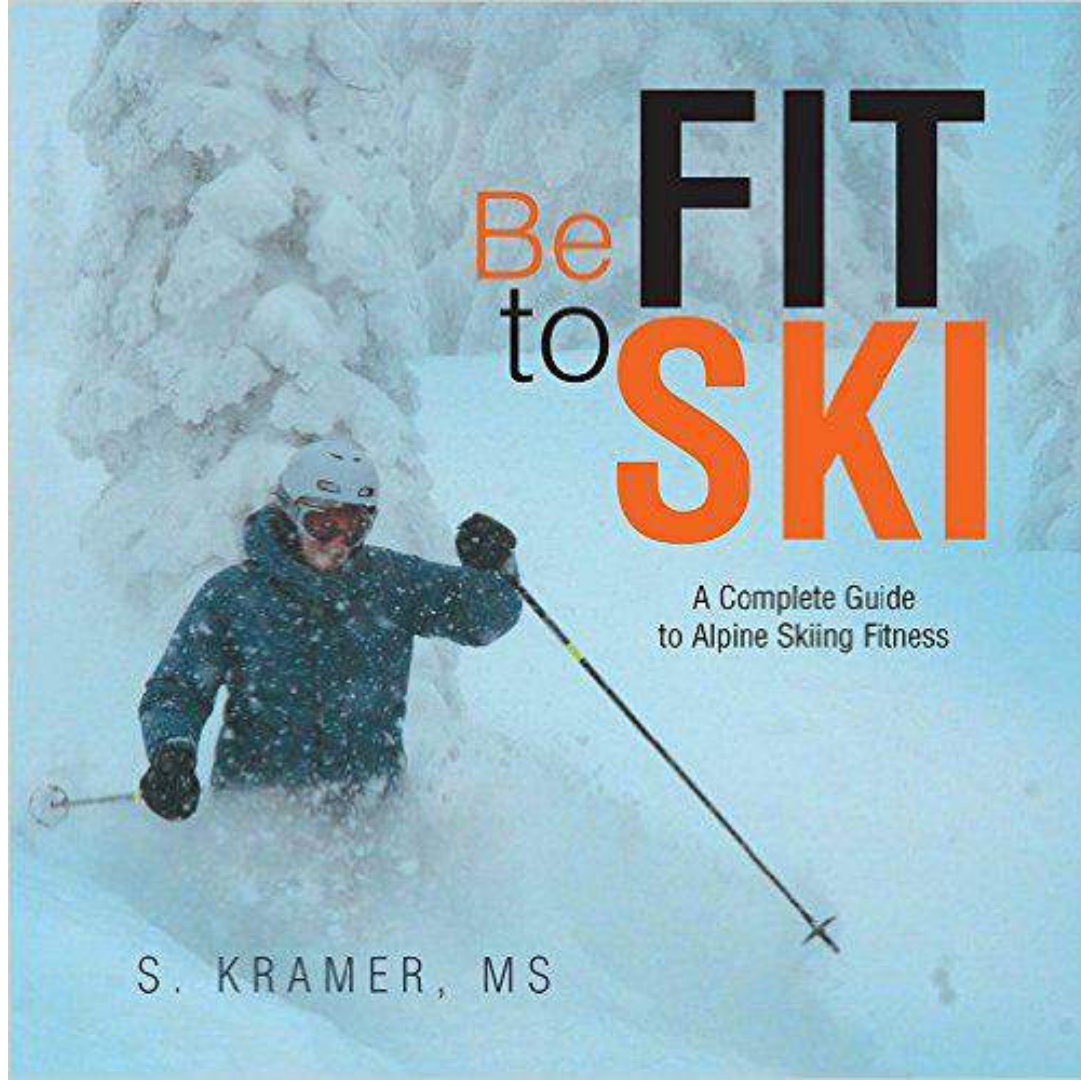
*“Methods are many principles are few, methods always change, principles never do”*

-Alwyn Cosgrove via Bruce Lee

**“Young or Old, new pro or old hand, your *fitness level* will determine your risk of injury and ability to improve performance”**

*-Core Concepts pg78*

Buy This Book!





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