

Stay on Track

Training Secrets To Keep The Young Athlete From Running Into Injuries

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This is for general educational and informational purposes only. It is not medical advice and is not intended to replace consultation with qualified medical professional(s) regarding your specific circumstances.



Goals



- Run Efficiently
- Run Effectively
- Run Injury Resistant
- ...For the "Long Run"



Key Topics

- Anatomy of Running
- Common Running Injuries
- Strength and Flexibility Training
- Analysis of Running Technique
 - Flaws and Fixes



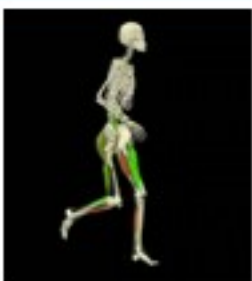
Anatomy of Running



Anatomy of Running: Stance Decelerators



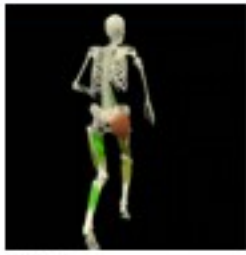
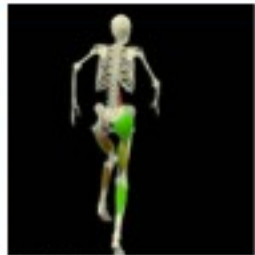
Hip and Knee "Brakes"
Quadriceps & Glute Medius



Ankle "Brakes"
Soleus & Posterior
Tibialis



Anatomy of Running: Stance Accelerators



Hip: Gluteus Maximus & Hip Adductors
Calf: Gastroc-Soleus



Anatomy of Running: Swing Accelerators



Hamstrings

Hip Flexors



Anatomy of Running



The Core

- Think Pillar Muscles
- Stabilizes your trunk and pelvis
- Allows for power production and transfer to extremities
- Strong Core = Power
 - running
 - jumping
 - throwing



The Facts

- Running Requires:
 - Stand, Swing, Float Phase
 - Lower Body Power
 - Upper Body Strength
 - CORE Stability
 - Total Body Control
 - Movement Flexibility
- With any weak link = injury risk
- 70-80% of injuries are from the waist down
- 60% of injuries are due to training errors



For Example...Running Requires:

1. Legs spend 40% of their time in stance and 60% in swing (20/80% sprint)
"The best swing is only as good as its spring"
2. Ground Reaction Force through the stance leg is 3-5 x BW
"Have good shock absorbers"
3. More distal (towards toes) foot contact.
You'll spend less time decelerating
4. Ankle bends to 30 degs at mid landing.
Stretch your lower calf
5. Hip Extension at the end of stance is 10 degs.
Stretch your Hip Flexors

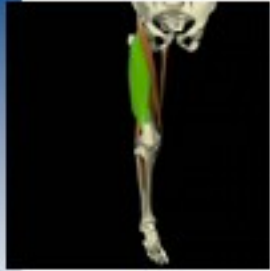


Top 5 Running Injuries





Running Injuries: Patellofemoral Pain



Patellofemoral Joint:

Knee cap that glides in a groove on the femur
33% of running injuries.

Symptoms

Friction creates pain on the back of the knee cap

Causes

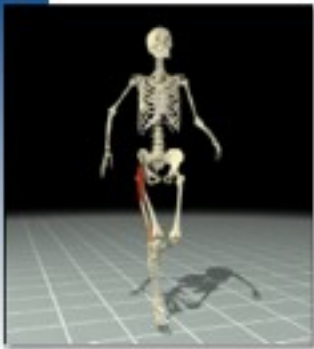
Faulty alignment - dynamic
Muscle imbalance

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Skeletally immature athletes can get Osgood Schlatter's at Patellar Tendon attachment



Running Injuries: Iliotibial Band Syndrome



IT Band:

thickened fascia connecting the pelvis to the outside of the lower leg.

Symptoms

Friction creates pain on the outside of the knee or hip

Causes

Decreased flexibility
Curved terrain
Muscle imbalance



Running Injuries: Medial Tibial Stress Syndrome

Shin Splints vs. Stress Reaction or Stress Fracture?

- Constant pain needs referral to MD(MRI, Bone Scan)
18% of running injuries (7% are stress fractures)

Symptoms:

Pain along inner part of lower shin.

Causes:

Muscle imbalances
Biomechanical landing flaw
Change in training regime



Tibialis Posterior holds up arch



Running Injuries: Achilles Tendonitis



Achilles Tendon: connects heel to calf (gastrosoleus muscle)

Symptoms: pain along the tendon. **Skeletally immature athletes will get heel pain vs. tendon = Sever's disease**

Causes
Faulty alignment - dynamic
Weak eccentric calf
Training intensity



Running Injuries: Muscle Strains

Hip Flexor

Muscle connecting femur to pelvis & spine

Symptoms

Pain and loss of strength with bending the hip

Causes

Tired or Tight muscle under a heavy or sudden load

Caution for Young Athletes: *Avulsion Fracture at front pelvis*



Running Injuries: Muscle Strains

Hamstring

Muscle connecting femur to pelvis

Symptoms

Pain and loss of strength with extending the hip

Causes

Tired or Tight muscle under a heavy or sudden load

Caution for Young Athletes: *Avulsion Fracture at ischial tuberosity*





Remember Your Goal



CORE Stability Training

- Train Functional Combination movements
- Avoid isolated movements (the straight crunch)
- Train your CORE to stabilize you during the Swing and stance motions.
- Transfer power to and from the arms and legs



CORE Stability Training: Movement Preparation



Quadruped "Bird Dog"

Hold x 5 seconds x 10 repetitions each side



CORE Stability Training: Movement Preparation

Planks



- Front and sides goal is holding x 1 minute
- Keep the spine straight "no weak links"



Glute and Hamstring Strengthening

Bridge Progression



Lift squeezing glutes, not back or quads
2 sets of 8-12 reps



Core & Leg Stability: Single Leg Squat

- When you are in the stance, HIP, KNEE & FOOT alignment is key.
- Keep foot straight, hips level and knee cap in line with 2nd toe



Faulty mini squat



Mini squat corrected



Build Single Leg Stability: Single Leg Squats and Lunges



2 sets of 8-12 repetitions each leg
Alignment is Key!



Core Stability & Leg Strength: Sprinters Calf Raise



- Perform a heel raise in a sprint lean posture
- opposite hip flexes up to 90 degs
- 2 sets of 20



Flexibility Training





Static Stretches AFTER you Run.



Flexibility of Gluteals & Calf



Hamstrings & Calf

- Static Stretching: Hold for 30 seconds
- Relax into the stretch, think elongation!



Static Stretches AFTER you Run.

Flexibility - Gastrocsoleus



Flexibility must be in foot neutral - ankle needs to shock absorb/bend about 30 dgrs



The Foam Roll

- Excellent for all running muscles AFTER a workout:
- Quads, IT Band, Hamstrings Glutes, Gastrocsoleus





Static Stretches AFTER you Run.

Quads



Hip Flexor



Implementation

- Build up your Lower Body Power!
- Work on your CORE Stability!
- Do a Dynamic warm up before you run
- Do your Stretches and your Foam Roller after your run
- Technique is Paramount
- Analysis of Running Technique
 - Flaws and Fixes

