

R. Jackson

Ed 856 Physical Basis of Coaching

Project #4 Strength and Conditioning for Injury Prevention

### Identification of Common Injuries

- **Achilles Tendonitis**

This inflammation of the tendon is sensed in the lower third of your lower leg from where the calf meets tendon to where the tendon inserts into and wraps around your heel. This injury can be caused from overuse or misalignment of foot strike like over or under pronation.

- **Ankle Sprains**

Most often athletes experience lateral ligament sprains where the ankle turns over so the sole of the foot face inwards, damaging the ligaments on the outside of the ankle. This is most often caused by a lack of strength in the muscles around the ankle as well as low clearance heights between the feet and the floor during running.

- **Hamstring Strain**

The muscles of the hamstring (semitendinosus, semimembranosus, and biceps femorus) are used to decelerate the tibia as it swings out. Most often injuries are seen just before the foot strikes the ground, as this is where the muscle is maximally activated and has reached its maximum length. Often in females, this injury can be a result of a muscular imbalance with overdeveloped quadriceps

- **Hip Flexor Strain**

This group of skeletal muscles (psoas major, psoas minor, iliacus muscle) acts to flex the femur and pull the knee upward. Most often injuries are a result of overuse, lack of flexibility, or compensation for another injury

- **Illiotalibial Band Syndrome**

The IT band is a superficial thickening of tissue extending from outside the pelvis, over the hip and knee, and inserting just below the knee. It stabilizes the knee during running and the continual rubbing of the band over the femur, combined with repeated flexion and extension of the knee can cause inflammation. It can also be attributed to a weak gluteus medius, which causes the thigh to move too far inward as your foot strikes the ground, and the upper leg has to overcompensate, pulling on the IT Band.

- **Lower Back Pain**

This injury is often caused by tight hip flexors, causing an improper rotation of the hips, or weak muscles in the core, which are unable to support the spine properly. This can be

the result of a strength imbalance between the hip flexors, core, and back or a lack of strength in the core muscles

- **Lower-Body Stress Fracture**

Stress fractures are often found in the foot tibia, and head of the femur. They are often the result of intense training that causes overloading of the leg muscles, which strains the bone more quickly than the body's ability to build-up or remodel the bone.

- **Plantar Fasciitis**

This injury is classified by a sharp pain in the connective tissues that run from the heel to the base of the toes caused by the inflammation of the plantar fascia ligament. It occurs most often from overuse that puts repetitive or excessive stress on the tissue.

- **Patellofemoral Pain Syndrome or "Runners Knee"**

This overuse injury is often classified by tenderness behind or around the patella toward the center. There are numerous potential causes. It might occur when a mistracking patella irritates the femoral groove in which it rests on the thighbone. It could be a biomechanical problem where the patella is larger on one side than the other or may sit too high in the femoral groove. It could be a strength imbalance where weak quadriceps cause the patella to track out of alignment or tight hamstrings and calf muscles put pressure on the knee.

- **Shin Splints**

This injury is often from a lack of endurance or training or overuse and is a pain on the inside of the leg about three inches above the ankle where the tibialis posterior muscle and surrounding tendon may be irritated.

## **10-Exercise Strength and Conditioning Circuit**

The following exercises have been developed to aid in the prevention of many of the common injuries seen in runners. Many athletes do not always have the luxury of a weight room or gym to perform these exercises, so they are structured so that they can be performed at home or on the road.

## **Exercise: Eccentric Calf Drops on Stairs**

### **Purpose**

- Increase strength in muscles around ankle, calf, Achilles tendon
- Injury prevention for lower leg

### **Materials**

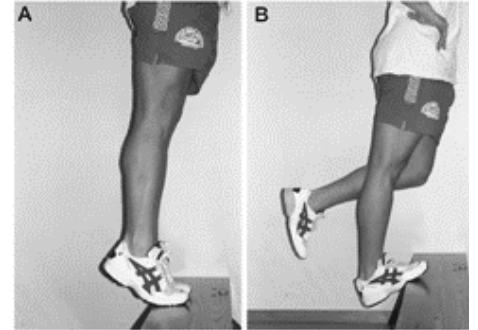
- Raised surface (stair, bench, etc)

### **Technique/Description**

- Place the ball of your feet on a step.
- Raise up on toes of BOTH feet (A)
- Shift your weight to one foot and slowly lower the heel of that foot below stair level (B)
- Repeat

### **Duration**

- 3 sets of 10 on each foot, alternating



## **Exercise: Inversion/Eversion Stretch**

### **Purpose**

- Increase strength in muscles around ankle, calf, Achilles tendon
- Injury prevention for lower leg/ankle

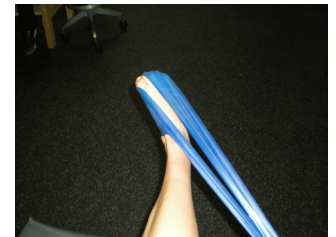
### **Materials**

- Resistance band

### **Technique/Description**

#### **Inversion**

- Sit so that your leg is bent at the knee, hanging over the edge of the seat.
- Wrap the resistance band around the top of the foot and hold then ends of the band with both hands
- While pulling on the resistance band, bend your foot toward the center of your body, curling your toes at the end to work the internal muscles of the foot.
- Release and repeat with both feet



#### **Eversion**

- Sit as you were for inversion with the band around your foot
- This time, while pulling the resistance band, bend your foot away from the center of your body, curling your toes at the end to work the internal muscles of the foot.
- Release and repeat with both feet



### **Duration**

- 3 sets of 20 in each direction for each foot

## **Exercise: Barefoot Tripods**

### **Purpose**

- **Strengthen muscles of foot**
- **Improve strength and balance**
- **Injury prevention for plantar fascia ligament**

### **Materials**

- **none**

### **Technique/Description**

- Stand barefoot on one leg
- Think of your foot as a tripod and place equal amounts of pressure on your big toe, pinky toe, and heel
- Ground these three points as you scrunch up your arch.
- Hold for 30 seconds



### **Duration**

- Repeat three times on each foot

## **Exercise: Side Leg Raisers**

### **Purpose**

- **Strengthen gluteus medius, hip, and core muscles**
- **Injury prevention for IT band and hip flexor**

### **Materials**

- **none**

### **Technique/Description**

- Lay on your side with your hips and legs stacked
- Lift your top leg, keeping it straight, but point your toes inward and toward the ground
- Hold for 30 seconds and release
- Roll over so your opposite leg is on top, and repeat



### **Duration**

- 3 sets on each leg, working up to one minute per set

## **Exercise: Clams**

### **Purpose**

- Strengthen glutes, and muscles of the hip
- Improve core strength
- Injury prevention for iliotibial band syndrome and hip flexors

### **Materials**

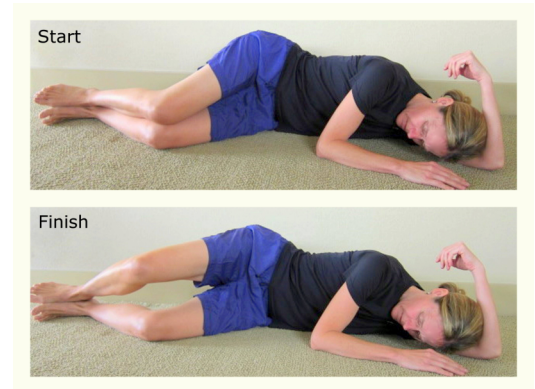
- none

### **Technique/Description**

- Lie on your right side.
- Bend both knees slightly keeping the legs stacked
- Keeping your ankle together, lift your left knee, hold for 2-3 seconds, and lower.
- Repeat

### **Duration**

- Do 2 sets of 8 reps on each side
- If you want a more advanced work out, add weight just above the knee



## **Exercise: Donkey Leg Lifts**

### **Purpose**

- Strengthen hamstring, glutes, and core muscles
- Improve strength and balance

### **Materials**

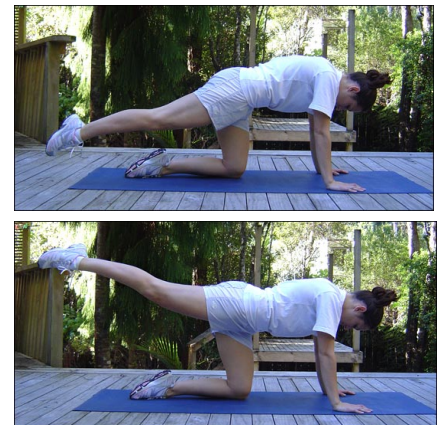
- none

### **Technique/Description**

- Get into the kneeling position with your knees under your hips and arms extended under your shoulders
- Lift one leg, extend it behind you, and keep it straight
- Raise the straight leg as high as you can without skewing your hips
- Hold for 3-5 seconds, squeezing your hamstring and glutes at the top
- Lower your leg, but do NOT let it touch the ground
- Repeat

### **Duration**

- Repeat 10 times fast and 10 time slow on each leg



## **Exercise: Wood Chop**

### **Purpose**

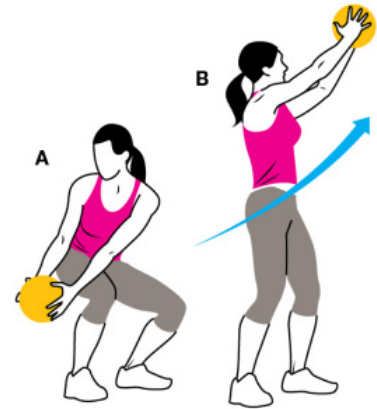
- Strengthen muscles of hips, quad, glutes, shoulders, back, and core
- Improve strength, balance, and stability

### **Materials**

- 5-8 lb medicine ball or dumbbell

### **Technique/Description**

- Stand with feet shoulder-width apart, holding a five- to eight-pound medicine ball or dumbbell in both hands.
- Squat down with the ball next to your right hip, keeping your heels on the floor, sticking your butt out, not letting your knees go more than a few inches toward your toes (A)
- Keeping your arms straight, raise the ball up and across your body until you are standing and the ball is above your left shoulder, maintaining a slight bend in your knees. (B)
- Keep your core engaged the whole time, as if bracing for a punch.
- Lower back to the start; this is one rep



### **Duration**

- 2 sets of 12-15 reps on each side

## **Exercise: Dorsal Raise**

### **Purpose**

- Strengthen muscles of back, core, and glutes
- Injury prevention of the lower back

### **Materials**

- none

### **Technique/Description**

- Lie on your stomach with both hands beside the head
- Lift the head, shoulders, and torso up off the floor, keeping your hips and legs still.
- Hold for 2-3 seconds and lower back to ground
- This should be a gradual smooth movement, not forced or fast
- Repeat



### **Duration**

- Beginners 2 sets of 10 reps
- More Advanced 3 sets 12-15 reps
- Variation: hold a eight or extend arms out in front of you

## **Exercise: Side Swing**

### **Purpose**

- Strengthen muscles around the knee and hip
- Improve core strength, stability, and balance
- Injury prevention lower back, hips, knees

### **Materials**

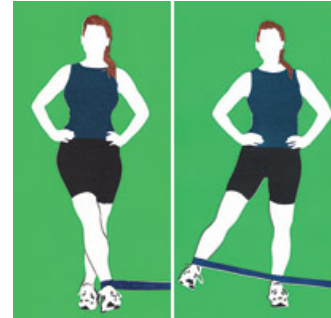
- Resistance band

### **Technique/Description**

- Anchor band on left side at floor height and loop around right ankle
- Balancing on your left foot, hold onto something if needed, raise the right leg out to the side, holding for 2-3 seconds
- Lower and repeat

### **Duration**

- 3 sets of 10 reps on each side



## **Exercise: Seated Rotator**

### **Purpose**

- Strengthen muscles around the knee and hip
- Improve core strength, stability, and balance
- Injury prevention lower back, hips, knees

### **Materials**

- Resistance band

### **Technique/Description**

- Sit so that your leg is bent at the knee, hanging over the edge of the seat.
- Anchor the band to the right and loop around your left ankle
- Cross your ankles
- Keeping your knees together, rotate the left leg outward about 12 inches.
- Return to the start and repeat

### **Duration**

- 3 sets of 10 reps on each side

