

## STRENGTH TRAINING FOR ENDURANCE ATHLETES

### Designing a Strength Program:

- 1) Postural Corrections
- 2) Plyometric/Power Training
- 3) Strength Training

### Postural Corrections

#### What is neutral posture?

- Head Level
- Shoulders Level
- Hips Level
- Knees Level
- Ankles Level

#### Why is neutral posture important?

*Posture* refers to the body's alignment and positioning with respect to the force of gravity. Whether we are standing, sitting or lying down, gravity exerts a force on our joints, ligaments and muscles. In *neutral posture*, the force of gravity is distributed evenly within the body so no one structure is overstressed. Neutral posture allows for movement efficiency.

#### Common Postural Issues in Endurance Athletes:

##### *Forward Head Posture*

- Caused by tight/weak t-spine, tight chest, and rib cage (RC) positioning
- Sitting at a desk all day can worsen/cause the issue – use lumbar support when seated!
- Correction – *The Chin Tuck*, cue the double chin!

##### *Kyphotic T-Spine/Rounding of Upper-Mid Back*

- Can have many causes – tight/weak t-spine, lack of core control/mid-back stability, muscle imbalance, RC positioning
- Sitting at a desk all day can worsen/cause the issue
- Correction – *T-Spine Mobility and Stability Exercises* (work rotation/lateral flexion/flexion - extension/combo Exercises), *Rib Cage/Core Control Drills* (Wall Angels, Pull Overs, Dead Bug), *Diaphragmatic Breathing*

##### *Pelvic Tilt (anterior or posterior tilt)*

- Can have many causes – tight t-spine/lower back, poor pelvic control, tight hip flexors, tight glutes/hip stabilizers
- Sitting at a desk all day can worsen/cause the issue
- Correction – *Paloff Press Variations*, *T-Spine Mobility and Stability Exercises*, *Lunge Variations* (work flexion, extension, abduction, adduction, internal and external rotation), *T-Spine Mobility/Stability Drills with Lunge Variations*, AVOID stretching low back

##### *Transition from Static Posture to Dynamic Posture Drills*

- Arm Drive - high elbow drive, move arms w/o movement at hips, avoid ant. shoulder glide, *Running Man Drills*
- High Knee Drills – focused on foot placement and posture, *OH Extended High Knees*
- Strides – focused on foot placement and posture, *OH Extended Strides*

*\*Include postural exercises as a part of the warm up*

## **Plyometric Training**

### **What is Plyometric Training?**

*Plyometric Training*, also known as "jump training," refers to exercises that improve the muscles ability to produce maximum force in a short period of time, with the goal of increasing speed and power.

### **Why is Plyometric Training important?**

Plyometric training teaches muscles to transition from extension to contraction rapidly - a NECESSARY skill for any runner. Athletes are taught how to use their muscles as spring boards, and how to spend as little time on the ground as possible with each foot strike. Athletes learn to control movement within a short range, allowing for improved movement efficiency.

### **Jumping Technique**

- Teach Neutral Posture/Core Control FIRST!
- ARMS ARMS ARMS!
- Knee Drive
- Load hamstrings to spring off ground
- Dorsiflex ankle
- Glute activation upon landing

### **Level I Plyometric Drills**

- Jump Rope – cue posture/core control, work up to 5 minutes continuous jump rope
- High Knees Drills/A Walks – cue stand tall, extend arms over head to promote extension, avoid low back flexion
- Rotary Running Drills/B Walks – teach the athlete to cycle foot through with hamstring (a SPRING muscle)

### **Level II Plyometric Drills**

- Jump Rope Variations – single leg hops, side to side hops, rotational hops, forward/back hops
- Single Leg High Knee Drills
- Intro to Small Hurdle Drills – no single leg work at this point or multi-plane drills
- Squat Jump Drills/Tuck Jumps (double leg jumps = less impact, but SL jumps = more helpful for runners)

### **Level III Plyometric Drills**

- Jump Rope Variations – SL hops moving forward, side-side hops moving forward, rotational hops moving forward
- T-Spine Rotations w/ High Knee Drills
- Small Hurdle Drills – SL hops, rotary running drills, bounds
- Horizontal vs Vertical Plyometric Drills – horizontal drills better for runners
- Short range plyometric drills are more important for runners, but can include minimal long range drills as well

*\*Include plyometric training before your strength workout or separately from strength training. Include light plyos before a sprint workout. Allow 72 hours of recovery between plyometric workouts. I suggest no more than 2, 30 minute plyometric workouts per week, allowing full recovery between sets.*

## **Strength Training**

### **What is muscular strength?**

*Muscular Strength* refers to the muscles ability to generate force against some form of resistance in a single effort.

**Why is strength training important for runners?**

The ability to produce strength is the base of athleticism, no matter what sport you play. Without it, the body loses movement skill. Strength is the foundation for all human movement. Fundamental strength in turn also leads to core stabilization, spinal protection, improved joint function, increased bone density, improved cardiac function, and mobility.

**Warm Up**

- Warm up should compliment training and fill in gaps
- T-Spine rotations, lateral flexion, flexion to extension exercises
- Core stability exercises in different planes of motion
- Lunge variations/Squat variations
- Get the athlete OPEN and teach them control in long range motion

**Workout** - think “Meat and Potatoes,” athlete should walk away feeling fresh, not overworked

*Compound Lift*

- Deadlift or Squat Variation (depending on what athlete feels comfortable with)
- Hips lead knees
- Start with basic 3-4X10 set/rep cycle until proper form is established
- Alternate btw. *Dynamic Effort* and *Max Effort* (DE = 8X3 or 10X2 @ 50-60% 1RM, ME = 3X3 @ 90-100% effort)

*Upper Body Push/Pull*

- Alt. horizontal/vertical push/pull (push ups/seated rows vs. OH Press/Pull Ups)
- 3X8-12 set/rep cycle

*Single Leg Variation*

- 3X8-12 set/rep cycle
- Reverse Lunge, SL Step Up, SL Squat, Multi-Plane Lunge Variations
- Add t-spine rotations to advance exercises

*Core Stability Exercise*

- Include 2 core stability exercises, 2-3X10-15 reps
- Progress Static holds (plank variations) to Dynamic Drills (med ball throws, include throws in various planes of motion)

*\*I suggest 2 strength workouts per week, alternating between DE and ME, and hor/ver upper body push/pull cycles. Allow 72 hours recovery between workouts. Include strength workout after running workouts- 3 weeks on, 1 week off.*

**Sample Training Routine**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
LSR/Full Recovery	Speed WO + ME & Ver. Push/Pull Strength Cycle	15 Minute Mobility WA + 30 min light plyo/core WO	Easy Run OR Full Recovery	Tempo Run/VO2 WO + DE & Hor Push/Pull SC	15 Minute Mobility WA + 30 min plyo/core WO	LSR/Full Recovery