Strength Training for Runners

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Samaritan Athletic Medicine
Strength Training for Runners

- Why?
- What?
- When?
- How?
- Where?
Why Strength Training?

Improve Performance & Decrease Injury Risk
Does Strength Training Improve Performance in Long Distance Running?
Improved Long Distance Running Performance due to Strength and Power Training

Maximal Strength Training Improves Running Economy in Distance Runners

- Storen et al, 2008

Explosive Strength Training Improves 5k Running Time by Improving Running Economy and Muscle Power

- Paavolainen et al, 1999

Short-Term Plyometric Training Improves Running Economy in Highly Trained Middle and Long Distance Runners

- Saunders et al, 2016
Using Strength Training to Improve Cardiovascular Fitness

- Strength Training Can:
  - Decrease resting heart rate by 5-12%...
  - Increase stroke volume...
  - Decrease resting blood pressure...
  - Increase maximal oxygen consumption (VO2max) by 5 to 8%...

...in previously sedentary or untrained individuals
Does Strength Training Decrease Injury Risk in Long Distance Running?
Risk Factors for Running Injuries

- Ground reaction forces which are between two and four times bodyweight
- Effect on body’s tissues (muscle, connective)?
- New or rapidly progressed stimulus or insufficient recovery from these stresses

- Uniform, cyclic motion
- Overuse
- Imbalance of muscle characteristics
  - Risk exponentially increases with poor mechanics and footwear/surface
Hip Abductor Weakness in Distance Runners with Iliotibial Band Syndrome - Fredericson et al, 2000

“association between hip abductor, adductor, and flexor muscle group strength imbalance and lower extremity overuse injuries in runners”
“while both legs of each uninjured runner had very similar hip muscle strength, among the injured runners, the injured side's hip abductor and flexor muscle groups were significantly weaker than the uninjured side”
Benefits of Strength Training for Runners

- Increased Strength of Muscle and Connective Tissue
  - Tissues that are stronger tend to be more durable
- Increased Movement Variability
  - Decrease muscle and strength imbalances
- Enhanced Recovery of Muscle and Connective Tissue
  - Increased androgenic hormone release
Why Strength Training?

Decrease Injury Risk
&
Improve Performance
Why Strength Training?

Decrease Injury Risk ✔

&

Improve Performance ✖
Why Strength Training?

Decrease Injury Risk

= 

Improve Performance
Injury Reduction

Most important ability of any athlete is availability

Most important training variable is consistency
TRAINING TO REDUCE INJURY RISK WILL HAVE A SIGNIFICANT IMPACT ON THE POTENTIAL FOR RUNNING PERFORMANCE
What Constitutes an Effective Strength Program for Runners?

80/20 Strength Training

- 80% of efforts dedicated towards both the areas of the body not addressed and training variables not achieved during running
- 20% of efforts dedicated towards the areas of the body and training variables that are directly related to improving running performance
Runners: The Good Strong
Runners: The Bad and Sometimes Ugly

Weak
Tight/
Imbalanced
Weak/Tight?
Runner’s Strength Training Needs

- Posterior Chain Strengthening
  - Back (especially lower trapezius, posterior shoulder), Glutes (hip extensors and abductors), Hamstrings

- Three Common Areas of Mobility
  - Ankle (and flexibility of surrounding muscles)
  - Hip (and flexibility of hip flexor muscles)
  - Thoracic Spine (and flexibility of muscles of anterior shoulder)

- Symmetry of Strength, Flexibility and Mobility

- Increased Muscle Stiffness (in contracted state)

- Variety of Movement Planes and Tempo
Posterior Chain Strengthening

https://www.youtube.com/watch?v=g2YGP6rGsAo
Mobility

https://www.youtube.com/watch?v=a54bz0MRbw8
Symmetry

https://www.youtube.com/watch?v=3CCfchYvP-8
Muscle Stiffness

https://www.youtube.com/watch?v=UDaaNrnOx_4
Movement Variability

https://www.youtube.com/watch?v=bttyMSWNsO0
When Should Runners Incorporate Strength Training?

- Strength training is supplemental to endurance training for runners

- Minimal effective dose
  - Bare minimum: 1x per week
  - Optimal: 2x per week
  - Bare minimum: Something is better than nothing
  - Optimal: 30 to 45 minute sessions for beginner
  - 45-60 minutes for advanced
When Should Runners Incorporate Strength Training?

- Fitting it into the training schedule
- Keep rest and recovery days as such
- Add to low/moderate volume training session days or high volume training session day IF followed by rest/recovery day

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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</thead>
<tbody>
<tr>
<td>3 Mile Tempo</td>
<td>4 Mile Run</td>
<td>400 Meter Repeats at Race Pace</td>
<td>6 mile run</td>
<td>Rest</td>
<td>10 mile long distance</td>
<td>Rest</td>
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<tr>
<td>Strength Training</td>
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How Should Runners Strength Train?

Four Part Strength Training Session:

1. Warm-Up
   - Tissue quality, joint mobility, movement efficiency and movement preparation

2. High Velocity Training
   - Plyometrics and explosive strength training

3. Low Velocity Training
   - Strength training

4. Recovery
   - Flexibility, tissue quality, breathing
Sample Two Session Per Week Strength Training for Runners

**Warm-Up**
- **Tissue Quality**
  - Focus on glutes, hamstring, calves, hip flexors, anterior shoulder/chest
- **Mobility**
  - Thoracic Spine, Hips, Ankles
- **Movement Efficiency**
  - Glute and rear deltoid/rotator cuff strengthening
  - Squat, hinge, press, pull, patterning
  - Opportunity for varied planes of movement

**Movement Preparation**
- Move through range of motion at increasing velocity
- Varied planes and speed of movement
- Increased voluntary joint stiffness
Sample Two Session Per Week Strength Training for Runners

Warm-Up

- **Tissue Quality**
  - Whole Body Foam Rolling
  - x10 rolls per area

- **Mobility**
  - Side Lying Rib Roll x5/side
  - Spiderman x5/leg
  - Stick Shoulder Mobility Series
  - x5 each
  - Wall Ankle Rock x5 per leg

- **Movement Efficiency**
  - Hip Press x5
  - Prayer Squat x5
  - Lateral Split Squat x5 per leg
  - Isometric Push-Up Hold x5 seconds
  - Band Pull Apart Series x5 each

Movement Preparation

- Knee to Chest Walk x10 Yards
- Heel to Butt Walk x10 Yards
- SLDL to Reverse Walk x10 Yards
- Knee to Opposite Shoulder x10 Yards
- Lateral Band Walks x10 Yards each way
- Lateral Shuffle x10 Yards each way
- Carioca x10 Yards each way
- Lateral Skips x10 Yards each way
<table>
<thead>
<tr>
<th>Session A</th>
<th>Session B</th>
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<tbody>
<tr>
<td>2a. Lower Body Explosive</td>
<td>2a. Lower Body Explosive</td>
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<tr>
<td>2b. Sagittal Upper Body Explosive</td>
<td>2b. Transverse Upper Body Explosive</td>
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<tr>
<td>3a. Bilateral Hip Dominant</td>
<td>3a. Bilateral Knee Dominant</td>
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<tr>
<td>3b. Horizontal Pull</td>
<td>3b. Vertical Pull</td>
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<tr>
<td>3c. Anti-Extension Core</td>
<td>3c. Hip Control Core</td>
</tr>
<tr>
<td>4a. Unilateral Hip Dominant</td>
<td>4a. Unilateral Hip Dominant</td>
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<tr>
<td>4b. Horizontal Push</td>
<td>4b. Horizontal Pull</td>
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<tr>
<td>4c. Anti-Rotation Core</td>
<td>4c. Loaded Carry</td>
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<tr>
<td>Stretching, Diaphragmatic</td>
<td>Stretching, Diaphragmatic</td>
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<td>Breathing, Low Intensity Aerobic</td>
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<tr>
<td>Exercise, Myofascial Release</td>
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<td>Session A</td>
<td>Session B</td>
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<tr>
<td><strong>High Velocity</strong></td>
<td><strong>Low Velocity</strong></td>
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| 1. Skips  
   a. Forward Start 2x10 Yards  
   b. Lateral Start 2x10 Yards | 1. Mini Hurdle Hops  
   a. Linear 2x5 per leg  
   b. Medial 2x5 per leg  
   c. Lateral 2x5 per leg |
| 2a. Box Jumps 3x5  
   2b. Tall Kneeling Chest Pass 3x5 | 2a. Kettlebell Swings 3x10  
   2b. Half Kneeling Side Pass 3x5 per side |
| 3a. Trap Bar Deadlift 3x8  
   3b. TRX Row 3x8  
   3c. Ab Wheel Roll-Out | 3a. Goblet Squat 3x8  
   3b. Half Kneeling X Pull-Down 3x8 per arm  
   3c. Wall Press Deadbug 3x8 per leg |
| 4a. Dumbbell Reverse Lunge 3x8 per leg  
   4b. Push-Up 3x8  
   4c. Half Kneeling Pallof Press 3x8/side | 4a. Single Leg Deadlift 3x8 per leg  
   4b. DB Bent-Over Row 3x8 per arm  
   4c. Farmer Carry 3x40 Yards |
| **Recovery** | **Recovery** |
| A. Belt Buckle Stretch x5 breaths per leg  
   B. Band Leg Lowering x5 per leg  
   C. Pigeon Stretch x5 breaths per leg | A. Bretzle Stretch x5 breaths per leg  
   B. Groin Rock x5 per leg  
   C. Downward Dog x5 breaths |
Where to Perform Strength Training?

Power Hour

THE SAM
Samaritan Athletic Medicine

Power Hour
Power Hour by SAM Elite

Schedule:

- Monday through Friday
  - 6 to 8am
  - 11:30am to 1:30pm
  - 4:30 to 6:30pm

Cost:

- $99- now through the race (three months)
Samaritan Half Marathon Running Group

Schedule:

- Thursdays at noon, January 19th to April 6th
- Meet in SAM Elite
- Warm-Up, 30 to 45 minute run, Recover

Cost:

- Free
Monday through Friday

6:00am to 6:30pm

Cost:

- $20 per session
- $50 for three sessions
To Participate or For More Information Please Contact

Kyle Bangen
kbangen@samhealth.org
419-233-3311 (cell)
541-768-1428 (office)
THANK YOU