



Speed Development for Distance and Mid- Distance Runners

Balancing Speed Development with Aerobic Training



Physiological Principles

- Events of 800m and above are primarily aerobic events
 - Will get over half of their energy from aerobic metabolism
 - 800m – 60%
 - 1600m – 75%
 - 3200m – 85%
 - 5000m – 90%
- Training should focus primarily on aerobic development
 - Aerobic – meaning energy is created with Oxygen
 - Anaerobic – energy can be created without Oxygen at a higher rate, but only capable of doing so for a short period of time

VO₂ Max

- Maximum amount of Oxygen an individual can utilize during intense exercise
 - Oxygen enters bloodstream through lungs
 - Carried to muscles
 - Then muscles need to be able to utilize the Oxygen
- Through training you can increase stroke volume – amount of blood pumped per heart beat
- Heart does not have to work as hard to do the same amount of work



VO₂ Max

- Increasing VO₂ Max allows athlete to hold faster pace for longer period of time
 - Increased energy contribution from aerobic sources decreases the amount of energy from anaerobic sources
- If able to limit anaerobic contribution, you can limit Lactate Production



Lactate Threshold

- Point during exercise that lactate builds up in blood faster than the body can remove it.
- Lactate is not a bad thing and does not cause fatigue, but accumulates as a product of anaerobic energy sources.
 - During energy production a Hydrogen atom is released and the more intense the exercise, the harder it is to clear the Hydrogen.
 - This causes the acidosis or “Burn”



Lactate Threshold

- Lactate production coincides with acidosis, so it is still a key factor in training
- Increasing Lactate Threshold pace increases the ability to provide energy through aerobic sources and allowing the athlete to hold a faster pace for a longer time with less lactate accumulation



SAID Principle

- Specific Adaptation to Imposed Demand
- When our body is placed under some form of stress, it starts to make adaptations that will allow the body to better withstand that stress
- My goal in training is to improve **Running Economy** – the energy required to run at any given pace
 - I believe the two biggest components of this are VO_2 Max and Lactate Threshold

Improving VO_2 Max

- Pace is equal to 3k pace
 - Running faster than VO_2 Max pace does not stimulate VO_2 Max improvements
- Key is time spent at VO_2 Max pace
- Repeats should be between 2 and 5min in length with 1:1 recovery or less
 - 5x1000 in 3:00 with 3:00 rest
- If running shorter repeats, shorten the rest
 - 2x4x400 in 73-75 with 45 seconds rest and 3min between sets



Improving Lactate Threshold

- Pace is “comfortably hard” or that can be held for race effort of 50-60min, 30-45 seconds/mile slower than 5k pace
 - Scientifically – 88-92% of Max HR
- Stress the lactate clearance ability – not to overstress that system
- Duration of 20 minutes
 - Can go longer, pace will slow depending on duration
 - Longer “LT” runs help develop mental strength



What is Speed?

- Majority of my philosophy deals with improving speed through improved aerobic performance.
- Can be considered anything faster than current race pace
- Pure Speed – All-out effort only maintained for a few seconds
- Closing Speed – Ability to run fast at the end of a race



How do you Improve Speed?

- Improve Sprinting Technique
 - Become more efficient
- Improve Strength
 - Cover more ground with each stride
 - Ability to handle more miles
 - Ability to handle faster repeats
- Short Fast Repeats
 - Train the body to run fast



Form Drills

- Walking High Knees
 - Rise up onto toes, opposite arm and leg in unison
- Paw Drill
 - Step down right underneath hips, quick return to position
- Hands on Hips High Knees
 - Driving knee up, keeping hips in place, no twisting
- Bounding
 - Exaggerated running motion

Walking High Knees



Paw Drill



Hands On Hips High Knees



Bounding





Pure Speed

- All out efforts not longer than 10 seconds with extended rest periods
- 80m repeats as fast as possible with 5min rest
- Benefits come from improved reaction from Central Nervous System
- Not a lot of benefit for distance runners, but good to incorporate fast twitch muscles
- Higher risk of injury



Strides and Accelerations

- Can be incorporated year round
- Less risky than pure speed workouts
- 6-10 x 100m at 1500 pace with 3min rest progressing to 400 pace
- 4-8 x 200m at 1500 pace with 3min rest
- 5x100m accelerations – take 50-60m to get up to 400m pace and hold that through 100m



Closing Speed

- Importance of Strength Training
- It is a combination of all training factors
- Athlete must be able to run “fast” in order to do it at end of race
- Athlete must have aerobic strength to run fast at end of race
- Athlete must pace themselves correctly, running too fast early will cause fatigue too soon



Strength Training

- Lifts/Movements that create power
- Involve the whole body
- Stabilize the core
- Lifts/Movements that simulate running form
- Progress to Single Leg exercises whenever possible

Strength Training

- Develop Season Long Program that coincides with your training program.
- First 3-4 weeks should be introduction or re-introduction of routine and technique
- Two days per week
 - First Day – Endurance Oriented
 - Second Day – Explosive Oriented

Strength Training Sample

Week 1 – Day 1 (Endurance)

- Clean Bar Warm-Up
 - RDL, Jump Shrug, Power Pull, Hang Power Clean, Front Squat
 - Each - 3X
- Hang Power Clean
 - 3 Sets of 5
- Back Squat
 - 2 Sets of 8
- Bench Press
 - 2 Sets of 8
- Good Mornings (Hip Width Stance)
 - 2 Sets of 8
- Chin Ups – (Palms towards you, weight vest to add resistance)
 - 2 Sets of 8
- DB Shoulder Press
 - 2 Sets of 8 Each Arm

Clean Bar Warm-Up



Hang Power Clean



Back Squat



DB Shoulder Press



Strength Training Sample

Week 1 - Day 2 (Explosive)

- Single Arm DB Snatch
 - 2 x 5 Each Arm
- Split Squat
 - 2 x 8
- Incline Bench
 - 2 x 8
- Physio-Ball Ham. Curl ((2-way (Bridge and DL Curl))
 - 2 x 8 Each Way
- Single Arm DB Row
 - 2 x 8 Each Arm

Single Arm DB Snatch



Split Squat and Split Squat Jump



Physio Ball Ham. Curl (2-Way)



Single Arm DB Row



Strength Training Sample

Week 4 – Day 1 (Strength)

- Clean Bar Warm-Up
- Hang Power Clean
 - 3 Sets of 5
- Back Squat
 - 3 Sets of 6
- Incline Bench
 - 3 Sets of 6
- RDL
 - 3 Sets of 6
- Pull-Ups – (Palms Parallel, weight vest to add resistance)
 - 3 Sets of 6
- Single Arm DB Shoulder Press
 - 2 Sets of 6 Each Arm

Single Arm DB Shoulder Press



Strength Training Sample

Week 4 – Day 2 (Explosive)

- Snatch Bar Warm-Up
 - RDL, Jump Shrug, Power Pull, HPS, OH Squat
 - Each x 3
- Hang Power Snatch
 - 3 Sets of 5
- Reverse Lunges
 - 3 Sets of 6 Each Leg
- Bench Press
 - 3 Sets of 6
- Slide Board Hamstring Curl Series (SL, SL, DL)
 - 3 sets of 6 Each Way
- Single Arm/Single Leg DB Row
 - 3 sets of 6 Each Arm

Snatch Bar Warm-Up



Hang Power Snatch



Reverse Lunges



Slide Board Hamstring Curl Series



Single Arm/Single Leg DB Row



Strength Training Sample

Week 8 – Day 1

- Clean Bar Warm-Up
- Power Clean
 - 4 sets of 4
- Back Squat
 - 3 sets of 5
- DB Bench Press
 - 3 sets of 5
- Single Leg RDL
 - 3 sets of 5 each leg
- Pull Ups (Palms Away)
 - 3 sets of 5
- Single Arm DB Shoulder Press
 - 2 sets of 5 each arm

Strength Training Sample

Week 8 – Day 2

- Snatch Bar Warm-Up
- Power Snatch
 - 4 Sets of 4
- Forward Lunges
 - 3 Sets of 5 Each Leg
- DB Incline Bench
 - 3 Sets of 6
- MB Hamstring Curl
 - 3 sets of 5
- TRX Inverted Row
 - 3 sets of 5

Forward Lunges



MB Hamstring Curls



TRX Inverted Row (Progression)



Sample Plans

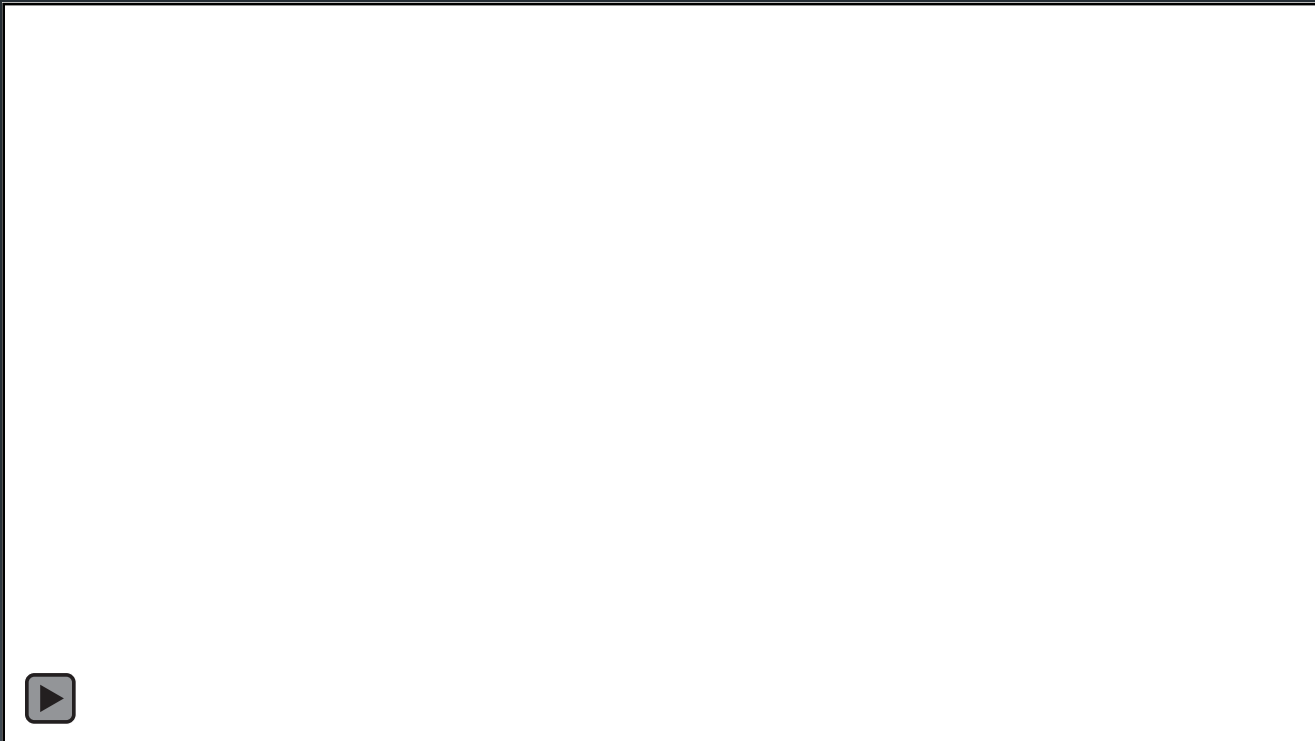
- Use Speed as a second workout
- Use Speed day as a back to back workout
- Monday - 20min LT
- Tuesday – 5x200 with 3min rest
- Wednesday – Easy Run – Lift Day
- Thursday – Easy Run with Form Drills and 6-10 x 100m strides
- Friday - VO_2 Max repeats
- Saturday – Easy Run – Lift Day
- Sunday – Long Run



Sample Plans

- Monday – Easy Run – Lifting Day
- Tuesday – AM – 20min LT, PM – 4x200 with 3min rest
- Wednesday – Easy Run – Lifting Day
- Thursday – Easy Run with Form Drills and 6-10 x 100m strides
- Friday - VO_2 Max repeats
- Saturday – Easy Run
- Sunday – Long Run

Comparison



How you design your plan is coaching

- Coaching is part science, part art. The physiology is the science, how you piece it together is the art.