Power and Its Importance in Distance Running

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Topics

Virginia Military Institute Experience

Strength, power, muscle fiber recruitment
  • relation to distance running

How to test your athletes
  • interpreting results
  • applying results to your athletes
Va. Military Institute Experience

• VMI Ratline
  • “Don’t expect too much from the freshmen [Rats].”
    • High stress environment, multiple coaching challenges
      • Practice window of 2hrs-2.5 hours a day
      • Average 5.5-6hrs sleep/night
    • Largest improvement came in the women during the ratline (August - January of first year)
      • Why?
  • Video (Pounding the stoop):
    • [https://www.youtube.com/watch?v=FrXv75dSsjc](https://www.youtube.com/watch?v=FrXv75dSsjc) (8:35)
Lab Testing

• Testing of Max Vo2, lactate threshold, and lactate tolerance remained relatively unchanged from pre-season testing to post-season testing.

• Testing showed the largest improvement came in the area of power and muscle fiber recruitment
  • Vertical Jump
  • Standing broad jump
  • 40yrd dash

• Max Vo2+Effecency = performance
Difference between strength and power.

• Strength is a muscles ability to move an object.
• Power is a muscles ability to move that “object” quickly.

• It is important to know the difference between the two. A runner can be strong and not very powerful.

• An increase in muscle fiber recruitment can help increase both power and strength.
How does improving power make you a better distance runner?

- Increasing the power of each muscle fiber will result in less fibers being used to run a certain pace, less fibers being recruited will result in a lower oxygen demand.
  - Example: Running up hill
How does improving muscle fiber recruitment make you a better distance runner?

• Increasing the amount of muscle fibers that one can recruit will result in a **larger reserve**.
  • You can never recruit ALL your muscle fibers at once. Body’s safety mechanism
  • Elite athletes can train their body to get close to that point

• With a larger reserve you can recruit muscle fibers late in the race as others fatigue
• With a larger reserve you can call on muscle fibers when a surge/kick in needed
  • Athletes that score high on power test have very good kicks
  • VMI runners rarely were outkicked
Power characteristics of Elite Distance Runners

Standing broad jump: Distance jumped/ athletes height
- Men: 1.30+
- Women: 1.20+

Vertical jump:
- Men: 24+ inches
- Women: 17+ inches

40yrd dash:
- Men: Sub 5.00
- Women: Sub 5.30

If you have an athlete with poor power numbers and they are a relatively good runner, they will have an exceptional aerobic engine (Max Vo2). Re: Efficiency

Most Kenyans have very good power numbers, even the bad ones.
What do the results tell us?

• Athlete will poor power numbers
  • Success will be in the longer distances unless power numbers improve
• Athletes with good power numbers “could” be successful in all distance events.
  • All dependent on how fatigue resistant they are
• Why do Kenyans dominate the steeplechase?
  • It’s a jumping event and requires a combination of good power and aerobic ability.
Exercises to improve muscular power and fiber recruitment

• Short hill sprints
• Clean and snatch
• Stadiums
• Bounding
• Double & single leg squats
• Box Jumps
Increased positive drug test amongst female distance and middle distance runners

• Red flag= Women are outperforming the men from the same country especially in the 800m/1500m/Steeplechase.

• Women have a greater room for improvement in regards to strength/power gains.
Donnie Cowart

- High School PB’s:
  - 9:37-3200m, 4:22-1600m
  - Poor aerobic, outstanding power!
- College PB’s:
  - 4:04-Mile, 8:44-Steeplechase
- Post Collegiate PB’s
  - 3:58-Mile, 8:26-Steeplechase, 13:47-5k
- 40yrd dash: 4.8
- Standing broad jump: 1.48
- Vertical jump: 24”
Mark Parrish-RS SR

• High School PB’s:
  • 9:09-3200m, 4:22-1600m
  • Poor power, good aerobic

• College PB’s:
  • 13:42-5k, 7:59-3k, 8:42-Steeplechase

• 40yd dash:
  • 5.1--------4.9

• Standing broad jump:
  • 1.21--------1.34

• Vertical jump:
  • 18”--------24”
Genevieve LaCaze

• High School PB’s:
  • 1500m-4:28, 3k-9:37
  • Average aerobic and power

• Collegiate PB’s:
  • 1500m-4:10, Steeplechase-9:37

• 40yrd dash: 5.25

• Standing broad jump: 1.22

• Vertical jump: 21”

• Squat went from 75lbs to 125lbs
Taylor Tubbs-RS FR

- High School PB’s:
  - 10:55-3200m, 4:54-1600m
  - Great power, poor aerobic

- College PB’s: (Fr year indoor)
  - 9:31-3k, 16:41-5k

- 40yrd dash: 5.1
- Standing broad jump: 1.25
- Vertical jump: 19”
Cory McGee

• High School PB’s:
  • 1600m-4:46
  • Good aerobic, good power
• Collegiate PB’s:
  • 1500m-4:06
• 40 yard dash: 5.1
• Standing broad jump: 1.21
• Vertical jump: 18”
Jimmy Clark-RSJR

• High School PB’s:
  • 1600m-4:11, 3200m-9:05
  • Great power, good aerobic

• Collegiate PB’s:
  • 1500m-3:48, 5k-13:58, 10k-29:08

• 40yrd dash: 4.7
• Standing broad jump: 1.49
• Vertical jump: 22”--to--28”
Summery

• As the athletes power numbers improve (vertical jump, standing broad jump, and 40yrd dash) so will their times on the track.

• You want to be a successful 800m/1500m/Steeplechaser, better have good power numbers.

• Identify the weakness and strengths of your athletes

• Improve both their aerobic strength and power/muscle recruitment

• But be careful! Not everyone will see the same results and you run the risk of hurting more than helping - Arroyo

• Not everyone will adapt. (Adaptability gene) JM/BS
Questions?