Strength Training for Cyclist

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BMX

A type of physical exercise specializing in the use of increasing resistance to induce muscular contraction which builds the strength, anaerobic endurance, or size of skeletal muscle to meet an added demand.

Health Benefits

- Improved overall health & wellbeing
- Increased bone & muscle density
- Improved tendon & ligament strength
- Improved joint function
- Reduced potential for injury
- Increased metabolism
- Improved cardiac function
- Elevated HDL cholesterol

Does Resistance Training Improve Cycling Performance?

Who’s Your Athlete?

Performance Enhancers

- Economy of movement
- Neuromuscular function
- Muscular strength
- Peak velocity
- Time to exhaustion
- Body composition
- Endurance capacity
- Injury prevention
- Correcting imbalances
- Psychological edge

Effects of Strength Training on Endurance Capacity in Top-Level Endurance Athletes: MSSE 2010

- Improved short & long term endurance capacity in moderately trained & elites with use of heavy resistance training
- Gains in maximum muscular strength
- Rate of force development
- Neuromuscular function
- Training-induced increases in Type IIA muscle fibers

Effects of Resistance Training on Endurance Capacity & Muscle Fiber Composition in Young Top-Level Cyclists: MSSE 2011

16 Week Training Protocol

- Maximum muscle strength (MVC) & rate of force development (RFD) increased 12-20%
- 45min endurance capacity increased 8%
- Type IIA fiber proportions increased
- No change in VO_2

Maximum Strength Training Improves Cycling Economy in Competitive Cyclists: JSCR 2010

- 16 competitive road cyclists (12m/4w)
- 8 week strength training protocol
- No changes in VO_2 or body weight

Improvements

- 1RM 14.2%
- RFD 16.7%
- Cycling economy 4.8%
- Work efficiency 4.7%
- Time to exhaustion 17.2%

Conclusion: Based on the results from the present study, we advise cyclists to included maximal strength training in their training programs.

Concurrent Training in Elite Male Runners: The Influence of Strength vs Muscular Endurance Training on Performance Outcomes: JSCR 2013

- 18 highly trained runners
- Endurance only group: run only
- Strength: heavy resistance, plyometric, & run
- Strength-endurance: endurance strength training (40% 1RM) & run
- 12 weeks of training @ 8x weekly (2 strength)
- 5 weeks detraining
- Strength & SE group: improvements in maximal strength, running economy, & peak velocity
- Strength group: improvement in 3k TT

Acute Prior Heavy Strength Exercise Bouts Improve the 20km Cycling TT Performance: JSCR 2014

4 x 5RM Leg Press @10min out Improvements

- 6.1% reduction in time to completion
- Greater cycling economy
- Increased power output in the first 10% of the TT

USAC Coaching Summit 2014

Traditional Cycling Off-Season

Old-School

- 3 months
- Small chainring only
- Low load-high volume
- 2-3 sets of 20-40 reps
- Machines & bodyweight
- Some core
- Lift again in 9 months
- 💩💩💩

Mid-School

- 3 months
- Small chainring only
- Medium load-medium volume
- 3 sets of 10
- Exclusively machines
- Some core
- Lift again in 9 months
- 💩💩💩

Concurrent Training

- Compound lifts for strength – squat, bench press, & deadlift
- Olympic lifts & plyometrics for explosiveness, power, & neuromuscular development – Clean & jerk, snatch, box jumps
- Core work to complete the chain & maintain stability
- Lifting programs cycled year-round

Why Compound & Olympic Lifts?

- No better way to develop strength & power
- Time efficient – 1 Olympic lift hits most muscle groups
- Speed of movement as a function of force development

Power Development

Exercise	Absolute Power (watts)	
	Male	Female
Bench Press	300	
Back Squat	1100	
Deadlift	1100	
Snatch*	3000	1750
2nd Pull**	5500	2900
Clean*	2950	1750
2nd Pull**	5500	2650
Jerk	5400	2600

Clean

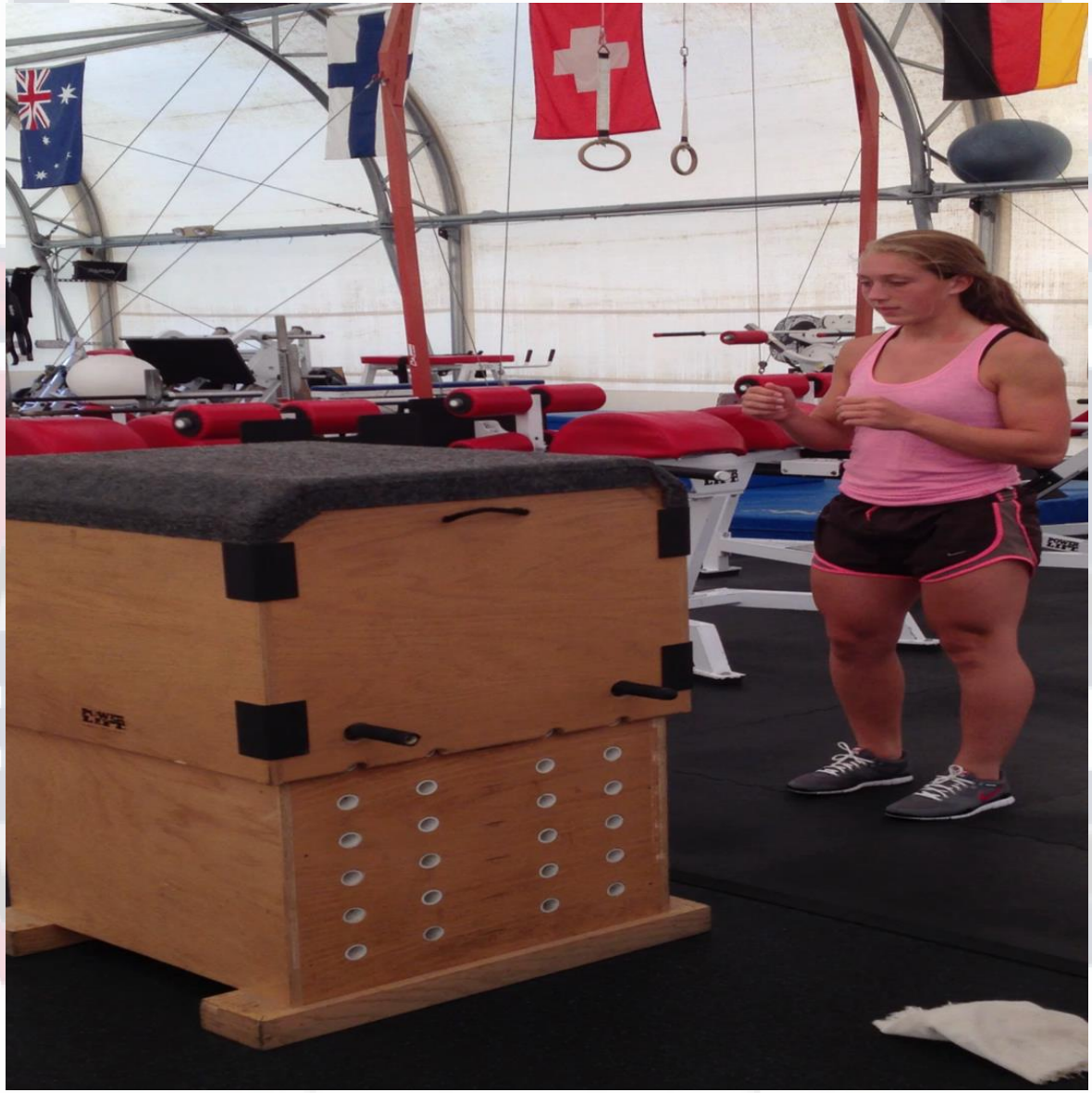
Snatch

Squat

Overhead Squat

Deadlift

Box Jump

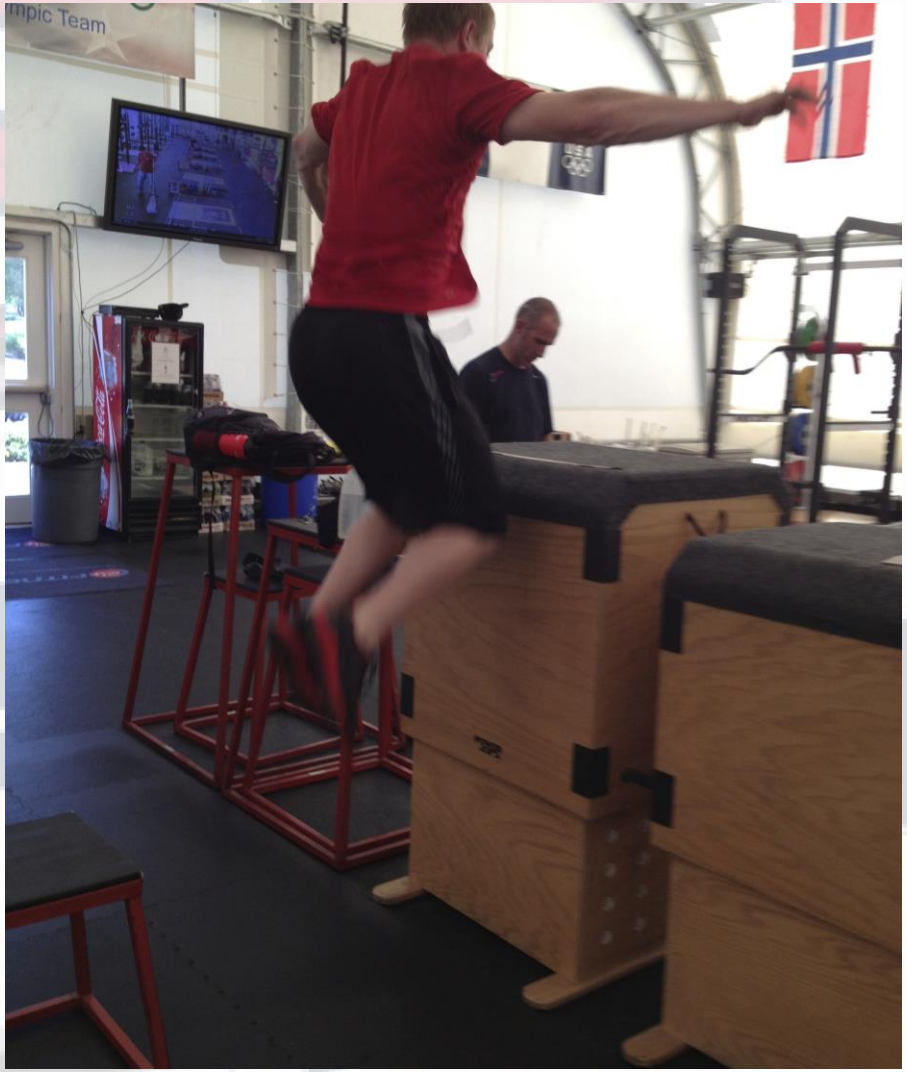


Bar Twist

Dynamic Plank

Limitations

- Programming or technique coaching knowledge
- Facility
- Changing belief systems
- Time needed for new skill development



First Steps

- Assess athlete needs
- Holistic coaching
- Big 3 – injury prevention, correcting imbalances, strength development
- Get educated or collaborate

Programming

- Anatomical adaptation & strength development
  - Compound lifts: Squat, deadlift, benchpress, & core
  - Medium volume & high intensity
  - Rep range for AA is 8-10, SD 5-6
  - 6-8 weeks
  - 2x weekly
- Power & Explosiveness
  - Olympic lifts, plyometrics, & core
  - Low to medium volume & high intensity
  - Rep range 3-5
  - 6-8 weeks
  - 2x weekly
- In-season Maintenance
  - Olympic lifts, plyometrics, compound , & core
  - Low volume & high intensity
  - Rep range 2-5
  - 2x weekly

Questions?