

Strength Training Strategies to Improve Track and Field Performance

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KEY ISSUES

- Just like the field of medicine, your number one goal when working with strength training is DO NO HARM.
 - Athletes need to walk out of each of your weight room sessions healthy
- Injury Prevention is the second key issue
 - The more that you can prevent even minor injuries on the track and in the field then the better your athletes will perform. Track is not a sport where you can play hurt.
- Performance is the third key issue

Every Situation Is Different

- Should you even have strength training in your program?
- Do you know how to coach the lifts?
- Don't just throw in weight room time to fill up a place in your practice schedule.
 - Know what you are doing
 - Know why you are doing it
 - Know how to teach and supervise it
- Do a cost/benefit analysis first
 - You may decide it may not be worth the risk vs. the reward
 - Doing it, but doing it incorrectly could be a waste of your time and resources.

Every Situation Is Different

- What is your set-up?
- Are you the weight room/strength coach during the day?
 - If so, balance what you do in class with what you do in practice.
 - If not, you and the strength instructor need to be on the same page to avoid overtraining, technique teaching issues, etc. that could cause injury.
- What are your time constraints?
- What are your equipment constraints?
- Do you have time for it during practice?
- IS IT GOING TO BE BENEFICIAL FOR YOUR PROGRAM?

Purposeful Strength Training

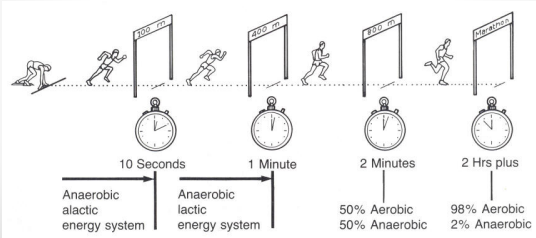
- What are you hoping to accomplish?
- Don't just be that coach who sends his kids into lift for 20 minutes each practice to do bench, squat, leg curls, etc.
- Have a purpose for everything that you are doing in the weightroom.
- It's okay for your distance kids to do bench press, but be sure that you have time for it.
- IF YOU THINK IT IS IMPORTANT, DO IT EVERY DAY! (if you can insure proper rest and technique)

Means to An End

- What is your end game?
- Really explore each event and what you think are key movements, biomechanical components, and energy system requirements.
- Prescribe the strength training exercises that meet the demand of your athletes and their events.

Energy Systems

- Which energy systems do your athlete's use and how can we use strength training to help with that system?



http://www.coachr.org/energy_systems.htm

Energy Systems

- Keep these recommendations in mind when training your athletes.

Development of the three energy systems

	Anaerobic Alactic	Anaerobic Lactic	Aerobic
Duration	0-10 secs	10 secs-1 min	1-60 mins +
Distance	20m-80m	80m-400m	300m-15Km or continuous runs
Intensity	maximal	90%-100%	50%-75%
Repetitions	3-4	1-5	3-20
Recovery	1½-3 mins	2-10 mins	1-3 mins
Sets	1-4	1-4	1-4
Recovery	8-10 mins	10-20 mins	5-8 mins

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Biomechanics

- What movements are key to your athlete's performance and how can you strength train to improve those movements?
- A complete biomechanical analysis requires an understanding and application of force, linear and rotational motion, velocity and acceleration, and momentum.
- Two practical applications for coaches:
 - Use all the joints that can be used
 - Use every joint in order

<http://www.coachr.org/biomechanics.htm>

Force Production

- Producing more force improves performance in every track and field event.
- Producing more force is dependent on recruiting muscle fiber types.
- Your athletes' performance depends on their proportion of muscle fiber types.
 - Slow Twitch- Always recruited first, slow contraction, resistant to fatigue, uses the aerobic energy system, low force production
 - Fast Twitch A- Fast contraction, somewhat resistant to fatigue, uses the long-term anaerobic energy system, high force production
 - Fast Twitch B- Extremely fast contraction, very low resistance to fatigue, short-term anaerobic energy system, very-high force production

Components of Physical Fitness

Health Related

- Cardiovascular Endurance
- Muscular Strength
- Muscular Endurance
- Body Composition
- Flexibility

Skill Related

- Power
- Speed
- Agility
- Coordination
- Balance
- Reaction Time

Overall Benefit for the Track and Field Athlete

- The body performs at it's highest level at the most optimal level of physical fitness.
- Every movement that you analyze in track and field events can be enhanced by improved strength, flexibility, and power.
- Your most prominent multi-joint lifts (Bench, Squat, and Power Clean) will all improve strength, flexibility, and power.
- The key is to program workouts with additional multi-joint lifts and auxiliaries (single-joint) lifts that fit the demands of each event.

Overall Benefit for the Track and Field Athlete

- Core work is important for every athlete especially in every track and field event.
- Training your core improves:
 - Balance
 - Body Control
 - Posture
 - The efficiency of the major movers in your body so they can produce more powerful movements
- The body is like a F1 Race Car. The chassis has to be strong and well built: [To make it to the next level, strength training is a must](#)

Overall Philosophy Resources

<https://ucrtrackstrength.wordpress.com/philosophy/>

[UCR TRACK STRENGTH TRAINING](#)

When Should You Lift?

- In-Season and/or Off-Season?
- In-Season: At what point in your practice should you lift?
- Optimal Timing
- Exercise Order
- Practice first or lift first?
- Always do your most skilled event work first.
- Always do explosive exercises that stress the nervous system before endurance activities.

Reference: [Strength Training for the Track & Field Athlete](#)

Strategies for Distance Events

Energy Systems and Strength Needs

- Depending on Event, but mostly dependent on aerobic energy system
- Force production is still key
- Efficient running mechanics

Exercise Prescription

- Low to Moderate Intensity Exercise- 50%-75% of Max
- Sets of 3-20 reps
- 1-3 minutes of recovery between sets
- 1-4 sets
- 5-8 minutes of recovery between exercises
- Select exercises that improves running efficiency

Strategies for Sprint Events

Energy Systems and Strength Needs

- Depending on Event, but mostly dependent on anaerobic lactic energy system
- Force production is critical
- Efficient running mechanics
- Focus on Fast Twitch A & B Fibers

Exercise Prescription

- High Intensity Exercise- 90% -100% of Max and Speed of Lift
- Sets of 1-5 reps
- 2-10 minutes of recovery between sets
- 1-4 sets
- 10-20 minutes of recovery between exercises
- Select exercises that improves running efficiency and triple extension

Special Strategies for Hurdle Events

Energy Systems and Strength Needs

- Really dependent on Event, 100-110 Hurdles are dependent on an anaerobic lactic energy system and 300 Hurdles depend on an aerobic energy system
- Force production is very key to get over hurdle
- Efficient running mechanics
- How do you coach the hurdles?

Exercise Prescription

- How can you mimic running a hurdle?
- Lunge jumps are a favorite of mine.
- Lower body exercises such as lunges, deadlift, squats, squat jumps are crucial in developing lower body power and force to get laterally over the hurdle and back into sprinting as soon as possible

Strategies for Vertical and Horizontal Jumps

Energy Systems and Strength Needs

- Similar needs in both jumps from an energy system and force production standpoint
- All events require explosive anaerobic alactic energy system use
- Speed and acceleration must be enhanced
- Explosive power is crucial
- Balance and body control are key

Exercise Prescription

- High Intensity Exercise- Max Intensity and Speed when lifting- NO SLOW LIFTS
- Sets of 3-4 reps
- 1.5-3 minutes of recovery between sets
- 1-4 sets
- 8-10 minutes of recovery between exercises
- Vertical leap builders important
- Core- both backs and abs

Special Strategies for Pole Vault

Energy Systems and Strength Needs

- Just a completely different animal than other events
- Requires explosive anaerobic alactic energy system use
- Speed and acceleration must be enhanced
- Explosive power is crucial
- Balance and body control are absolutely important
- Upper body strength crucial
- Keep in mind that muscular endurance may play a factor

Exercise Prescription

- High Intensity Exercise- Max Intensity and Speed when lifting- NO SLOW LIFTS
- Sets of 3-4 reps
- 1.5-3 minutes of recovery between sets
- 1-4 sets
- 8-10 minutes of recovery between exercises
- Vertical leap builders important
- Upper Body Pulls Then Press
- Core- both backs and abs

Strategies for Throwing Events

Energy Systems and Strength Needs

- Similar needs for all events from an energy system and force production standpoint
- All events require explosive anaerobic alactic energy system use
- Rotational movement must be addressed
- Explosive power is crucial
- Balance and body control are key
- Do not forget counter movements

Exercise Prescription

- High Intensity Exercise- Max Intensity and Speed when lifting- NO SLOW LIFTS
- Sets of 3-4 reps
- 1.5-3 minutes of recovery between sets
- 1-4 sets
- 8-10 minutes of recovery between exercises
- Triple Extension Exercises
- More Muscle Mass!
- Core- both backs and abs
- Rotational Strength Builders

Special Strategies for Javelin

Energy Systems and Strength Needs

- Major risk of arm and back injuries
- Treat your javelin thrower like a baseball pitcher
- Never overtrain
- Extreme flexibility
- Definitely an anaerobic alactic energy system exercise, but doesn't require brute strength

Exercise Prescription

- Injury prevention for throwing arm and back must be incorporated
- Rotator Cuff Builders
- Core strength is important to create rotational power and prevent back injuries
- TRX Rip Stick is a great trainer
- Be careful with loading the arm.
- Arm Speed and Power are more important than load

Special Strategies for Shot Put

Energy Systems and Strength Needs

- Muscle mass is crucial to have a larger cross section of muscle which increase the muscle fibers activated to create power
- Dependent on the style of shot putter you have, but rotational power is still crucial regardless
- Angle of the throwing motion must be addressed

Exercise Prescription

- Heavy loads and lots of reps
- However, don't sacrifice power for building muscle mass- delicate balance
- Triple extension exercises are important
- Standing presses (remember you push against the bench when you do incline/bench)
- Check out Primal ATC on YouTube- Great stuff for all throws

I only have 15 minutes

- Key lifts that will help all of your athletes stay healthy and improve their performance.
- Explosive Exercises
- Limited Time, Limited Resources, Limited Space
- Don't be afraid to bring the weights to the track.
- Don't be afraid to just do bodyweight exercises
- Multi-Joint Lifts are the best to do when time is limited.
- Posterior Chain Exercises are a must
- DO NOT GET CAUGHT UP IN THE THOUGHT THAT STRENGTH TRAINING EXERCISES MUST USE WEIGHTS. Bodyweight or any type of resistance can be used such as: manual resistance, isometric, etc.

Secret Weapon

- Focus on Recovery
- Still something I am exploring and researching, but you must combat the constant state of inflammation that a body is in when training.
 - Foam Roll
 - LaCrosse Balls
 - Tiger Tails/The Stick
 - Agility Cushion
 - Theracane/Q-Flex- Accupressure
 - Compression
 - Sleep
 - Nutrition
 - Handling Travel

Advanced Theories

- MIZZOU has their female throwers max out the day before the meet.
- TENNESSEE FOOTBALL has their football players not do any hard physical labor on Thursday before a Saturday game. They crank it up on Friday.
- Consider when you want your best performances? When your athletes should be peaking? Peaking time period is not a time to lay off intensity in strength workouts.
- 30-60-90 Drill Theory in Sprinting may apply

Great Resources

- <http://www.ncacoach.org/uploads/2011-Strength%20%20Lefever.pdf>
- <http://www.ctgdevelopment.net/ImagesNew/PDF/Weight%20Training%20for%20Long%20And%20Triple%20Jumpers-New.pdf>
- www.stack.com
- <https://www.youtube.com/user/PrimalATC>

Thank You! Have a Great Season!

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