

June 21, 2013

Move - Be Capable

- Choose your goals.
- Mobility before coordination.
- Coordination before strength.
- Strength before endurance.

Choose your goals.

- Fitness = Mobility + Coordination + Strength + Endurance
 - Fitness is the ability to do work.
 - Goals must be specific and must be measurable (i.e. perform a movement, travel a distance, lift a weight, maintain a speed).
 - Develop a solid foundation of mobility, coordination, and strength, then target specific goals for specific activities/sports.
 - Your body will adapt to the type of work it performs. Muscle performance is driven by its energy systems. Each muscle will have some fat-fueled slow twitch fibers for long duration low output, some creatine-fueled fast twitch fibers for short duration high output (< 10 sec) and some fibers fueled by glucose or lactic acid that bridge the gap between fast and slow twitch.
 - If you specialize in power, endurance will suffer. If you specialize in endurance, power will suffer.
 - Fitness is not all or nothing. 10-15 minutes a day of focused movement is exponentially better than no exercise at all and critical to staying healthy. Effective exercise for health can be done without a gym and without equipment.

Mobility before coordination.

- Mobility = Flexibility + Movement Patterns
 - Flexibility is determined by muscle and fascia (connective tissue). Muscle and fascia form one big connected network.

Disclaimer: This information is being shared, not prescribed. You are responsible for your own health.

- Muscles are both cables and elastic. When lifting, muscles work like cables. When running, muscles work like elastic.
- Too much flexibility is like elastic that has lost its stretch. Too much flexibility decreases strength and endurance.
- Full range of motion (ankles, knees, hips, back, shoulders, wrists) for a desired movement must be established first. The body will compensate for a reduced range of motion with poor movement patterns. Poor movement patterns will lead to muscle imbalances.
- Unbalanced muscle development will produce poor skeletal alignment. Poor skeletal alignment will lead to pain, injury and reduced capability.
- Poor movement patterns and muscle imbalances must be corrected before any chronic pain or chronic injury can be healed.
- It's much easier to maintain mobility than to correct a deficiency. To maintain full range of motion, mobility should be exercised every day. Develop a mobility routine that is short (10-15 min), targets all the major joints, and can be performed without equipment. Your mobility routine must be possible whether you are at home, in a hotel, or in the field. Ideas for mobility routines can be found [here](#), [here](#), or [here](#), or yoga, or Tai Chi...
- Start a routine, have goals, see how it works, make it better.

Coordination before strength.

- Coordination = Sensation Linked With Action
 - Coordination is muscle memory. Your body has millions of sensory cells and millions of motor neurons. Coordination is linking the right sensory cells with the right motor neurons.
 - Break down movements to determine focus points and then put the movement back together. Focus points can be internal sensation or external stimulation.
 - Each movement is an initial action followed by micro-adjustments. There is a cue to start the movement (something that signals it's time to go) and sensations that guide the micro-adjustments.
 - Adding weight to develop strength before a building a strong coordination base will only produce poor movement patterns.
 - For an outstanding study of how coordination is developed, coached and practiced, check out *The Talent Code* by Daniel Coyle.

Disclaimer: This information is being shared, not prescribed. You are responsible for your own health.

Strength before endurance.

- Strength = Coordination + Mechanics + Muscle.
 - Strength is a combination of muscle motor neurons firing at the right time (coordination), efficient lines of force (mechanics), and strong muscle fibers.
 - Muscles will fire as few motor neurons as possible to accomplish the required work.
 - Muscles have to be worked to be maintained or strengthened. To increase strength, lift heavy weights. Perform sets of 1-3 reps with 95-100% of the maximum weight you can lift. Low reps near max weight will increase strength without increasing size (which is the best way to increase performance).
 - As coordination and mechanics improve, less muscle will be needed. More weight will be required to continue to build muscle. When first starting out, just about any lifting schedule will increase strength. As the body adapts, the lifting schedule will have to be varied to continue to produce gains. Variety can be added by adjusting rest between lifting days, rest between sets, lifting speed, exercise order, and many, many other variables.
 - To increase muscle volume and endurance, do sets of high reps (8-10+).
 - Exercise machines only work one leg of the strength triad. Machines do not improve coordination or mechanics. Machines increase the risk of injury by strengthening major muscle groups without strengthening the supporting muscles or developing proper muscle coordination. Machines are useful for rehabilitation, dangerous for getting stronger.
 - Bodybuilding isolation exercises with free weights are only slightly better than exercise machines. Muscles do not work in isolation.

- Endurance = Sustained Strength
 - Strength (coordination, mechanics, and muscle) is the foundation of endurance. Sustained strength is coordination + mechanics + muscle + waste removal + fuel delivery.
 - Endurance is dependent on movement efficiency. Proper coordination and mechanics ensure the most efficient application of

Disclaimer: This information is being shared, not prescribed. You are responsible for your own health.

force. Bad coordination or mechanics bleed energy and lead to muscle imbalance and injury. Get the coordination and mechanics down before adding volume.

- Stronger muscles are more efficient, they require a lower percentage of total power output for each stride or stroke.
- Waste removal is dependent on a strong heart and a dense capillary network. Muscles shut down above the aerobic threshold because of the onset of acidosis, a build up of hydrogen molecules.
- Fuel delivery to support aerobic activity is dependent on a strong heart, dense capillary network, and mitochondria density in the muscles.
- The heart is a muscle and has to be stressed to get stronger. Max heart rate is fixed by the structure of the heart. When the heart gets stronger, max heart rate stays the same while resting heart rate drops (the pump is stronger, so less cycles are required to do the same amount of work).
- The most efficient way to increase heart strength, capillary density, and mitochondria density is with interval training - repeatedly placing a high demand on the network and forcing it to recover quickly.
- Long distances for endurance training help identify the body's weak points and goals for future training. Interval training can prep muscles but won't necessarily reveal all the mental and physical challenges of an endurance event.
- Endurance events can be good for the mind but are tough on the body - they place an oxidative load and cortisol load on the body for a prolonged period of time.

Disclaimer: This information is being shared, not prescribed. You are responsible for your own health.

Book Recommendations

(Recommend paperbacks vice e-books for easier use as references)

General Information

Anatomy Trains by Thomas Myers. A must for trainers, coaches, physical therapists, and serious athletes. Provides exceptional insight into how the body works as coordinated systems rather than isolated parts.

Supertraining by Mel Siff. An excellent reference for trainers and coaches.

Power Speed Endurance by Brian Mackenzie. A solid reference for all skill levels - from the weekend warrior to serious athlete. Provides extensive technique information for running, biking, swimming and Crossfit.

Mobility

Becoming a Supple Leopard by Kelly Starrett. Kelly's philosophy is that anyone should be able to perform their own mobility maintenance.

Foundation by Eric Goodman. Focused on building a solid posterior chain, Foundation provides an excellent starting point for a daily mobility routine.

Coordination

The Talent Code by Daniel Coyle. Game Changer. Daniel Coyle explains how to learn new skills. An easy, entertaining explanation of how to be better at everything from music to sports.

Strength

Practical Programming by Mark Rippetoe. A short read that outlines the principles behind programming for strength training.

Starting Strength by Mark Rippetoe. An in depth explanation of the six basic lifts (deadlift, squat, bench, press, power clean, power snatch). If you don't have access to a good coach, buy this book.

Overcoming Gravity by Steven Low. Systematic program for bodyweight exercises on the floor, bar, rings, and parallel bars.

Endurance

Healthy Intelligent Training by Keith Livingstone. Keith explains the methods of Arthur Lydiard, an endurance coach who produced world champion runners out of a small town in New Zealand.

Disclaimer: This information is being shared, not prescribed. You are responsible for your own health.