

TRAINING FOR PLAYING

HOW THE QUICK LIFTS TRANSFER FROM THE WEIGHTROOM TO THE PLAYING FIELD

By Tom Cross

What is the primary goal of the strength and conditioning program in your school? Is the primary goal fundamentally the same for all sports? I believe the primary goal in a school strength & conditioning setting to be **IMPROVED ATHLETIC PERFORMANCE**.

With the goal clearly in mind, how do we proceed? Strength and "strong" are quite general and sometimes vague terms when applied to sports. As an example, a strong shot putter has quite different attributes from a strong distance runner. Vern Gambetta describes strength as a continuum process from general, through special, to specific.

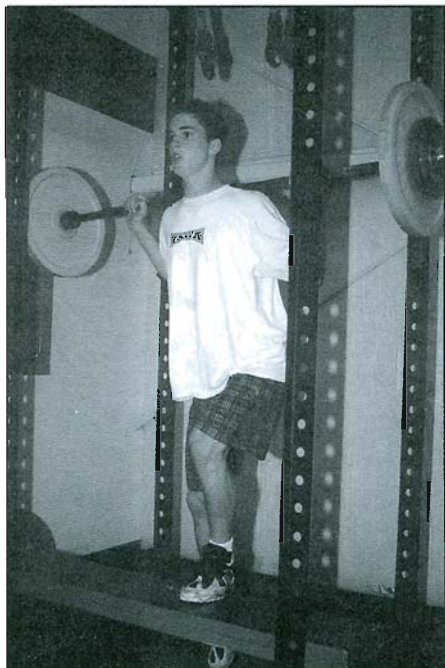
Strength training is a means to an end; it is not an end in itself. Strength, which improves the Rate of Force Development (RFD) is beneficial in reaching our goal. The concept that strength training = weight training is extremely limiting. For many athletes, especially beginners, the ultimate free weight is their own body.

In order to achieve our goal we need a balanced program to develop functional strength. We must examine the demands of the sport, train the dominant energy systems, and include a wide variety of training methods based on sound principles and scientific evidence.

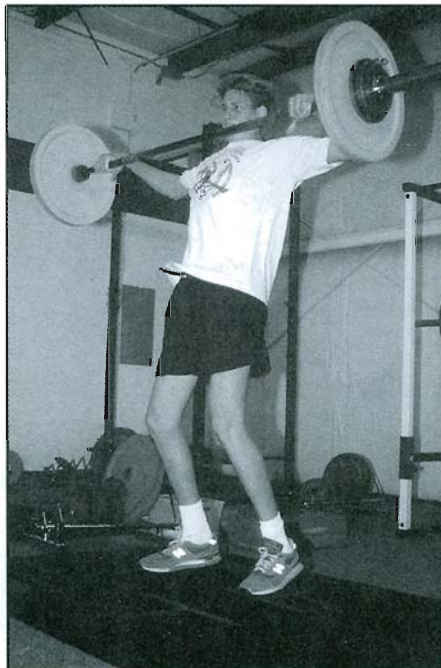
PRINCIPLES OF TRAINING TO IMPROVE ATHLETIC PERFORMANCE

1. TRAIN STANDING UP

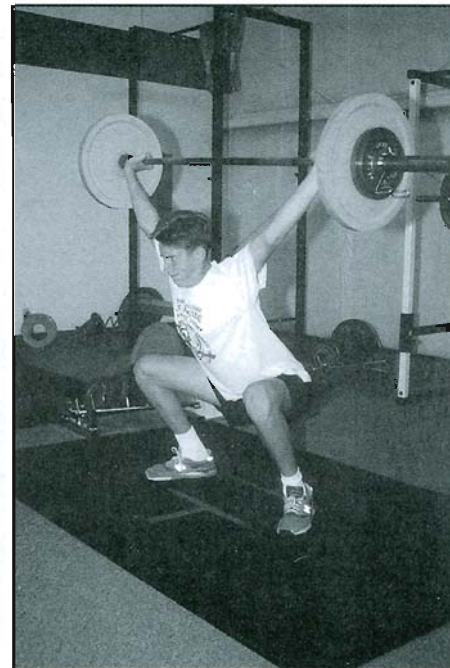
The common sports skills of running, jumping, starting, stopping, throwing, swinging, and turning are all initiated by applying force with the feet against the ground. As an athlete increases the force against the ground and reduces the time required to apply the force (RFD), the more powerful they become. Training must be centered around these kinds of movements (squats, plyometrics, pulls and a variety of



Luke a 15 yr. old baseball player is doing Barbell Step-Ups



Tim in transition phase of a Power Snatch.



Tim, a 6-6 B-ball player shows the low position of a Drop Snatch.

agility drills). The type of strength developed with machines and isometric exercise is not readily transferable to improved sport performance.

2. Train With Multi-Joint Movements

The body is a system of links (bones-muscles-joints), which must work together. The concurrent shift that occurs during closed kinetic chain exercise (feet on the earth) causes unique muscular contractions and intricate muscular interactions that cannot be duplicated with joint isolation exercise. To achieve our primary goal, it is important to train movements, not merely muscles.

Most total body movements, athletic or otherwise, involve an extension of the ankle, knee, and hip joint (triple extension). Think of a hang snatch exercise. The triple exten-

sion begins the movement which then passes through the trunk to the shoulders, elbows, and wrists. Compare this total movement of the body, quickly generating explosive force, to having athletes doing isolated exercises for each of the six joints. There is no comparison for the athlete. Isolation exercise may work for the bodybuilder to improve appearance, but athletes need to build their training on multi-joint movements to improve performance.

3. Train With Movements in All Dimensions

Sport skills require movements in all directions and often simultaneously. Not only does the athlete move forward and backward; up and down; side to side; they may move in combinations involving rotation,

diagonals, and always requiring balance. Machines certainly limit these sport skills. Only free weights (including medicine balls and dumbbells) allow the necessary combinations of movement which promote coordination, balance, and a kinesthetic awareness. Frequently, body weight may be the ultimate free weight. . . What has happened to push-ups, pull-ups, dips, step-ups, and lunges?

4. Train Explosively When Possible

Since most sports require quick and powerful movements, the training must be designed to improve the RFD. Explosive training builds upon foundations established by use of the first 3 training principles. It involves plyometric movements, olympic lifts, the triple extension, and the Stretch-Shortening Cycle (SSC). (Note: Discussion of plyometrics and the SSC is beyond the scope of this article. Much pertinent information is available including the BFS Spring Journal).

Something to think about: Plyometric movements allow for extremely high loading forces. In the basketball lay-up for example:

1. 2 x BW (body weight) - on the take-off foot
2. 9 x BW - on a double foot landing has been recorded; however, the average is about 5 x BW

In the triple extension olympic movements (clean, snatch, jerk)

1. (2) 5 x BW - during the explosive pull phase
2. 3 x BW - the average

These movements can produce extreme loading forces without the extreme high forces of landing from

SPEED - STRENGTH - POWER

Work = Force x Distance
 Power = Work/Time = Hp
 Bench Press = BP

BP @ 110 lbs x 1.4 ft. = 154 ft. lbs. in 2 seconds = .14 Hp
 Snatch @ 55 lbs x 4.5 ft. = 248 ft. lbs. in .75 seconds = .6 Hp

Reps BP @ 110 lbs. Snatch @ 55 lbs.

1	.14 Hp	.6 Hp
10	1.4 Hp	6 Hp
20	2.8 Hp	12 Hp
30	4.2 Hp	18 Hp
40	5.6 Hp	24 Hp

high intensity jumps.

Olympic lifts are specific to sports skills as they both require a high degree of speed and acceleration. Also, the sequential process of muscle recruitment is similar in order and velocity. These athletic movements are very powerful and require extremely high energy output. This method of training enhances neuro-muscular pathways in recruiting a higher number of fast-twitch fibers, while at the same time increasing the concentration of ATP-PC within the muscle. These factors contribute to marked increases in endurance during high intensity work. We use the chart to show this training concept to our athletes. Doing the Snatch with 1/2 the weight and 1/2 the reps still demands more than twice the energy required by the bench.

5. Utilize Periodization Principles

We have previously stated that strength is a continuum process which requires that the training methods and programs move from

general, through special, to specific. It is fundamental that the broader the base (general strength), the higher the peak (specific strength). Phases are combinations of volume and intensity designed to produce the desired body adaptation based on the training season.

There are 3 possible responses to training:

- 1.no change (program without enough stress)
- 2.injury or collapse (program with too much stress)
- 3.ongoing progress (program of variation in volume and intensity)

The foregoing illustration is perhaps over-simplified, but changes in program and variation in volume and intensity hold the key to reaching the full potential of the athlete. We use four week cycles with week 3 an unload time and week 5 for some testing and experimentation. Week 6 then begins a new program.

6. Use a Wide Variety of Exercises

Some excellent coaches believe that greater variety induces greater bodily adaptation. My coaching experiences agree with that concept so we constantly challenge the body to adapt by doing many variations of a basic movement and while using body weight, dumbbells, barbells, medicine balls, or sandbags for the resistance. Variety is a huge factor in prevention of boredom and is also used as a means of recover from a "hard" training routine. Once the athlete has learned the basic skills of the pulling movement, there are endless variations the coach can make available to produce desired adaptations. Variety also contributes to improved torso strength, especially exercises with weight overhead.

7. Train the Proper Energy System Properly

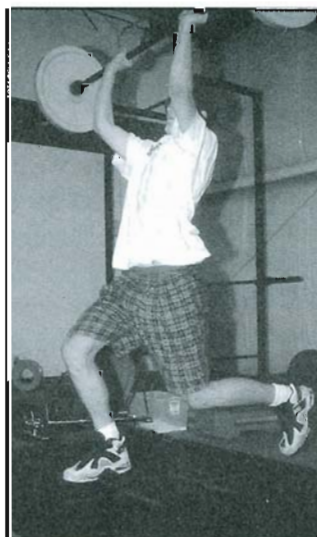
To improve the athletic performance the conditioning program must improve the energy capacity.



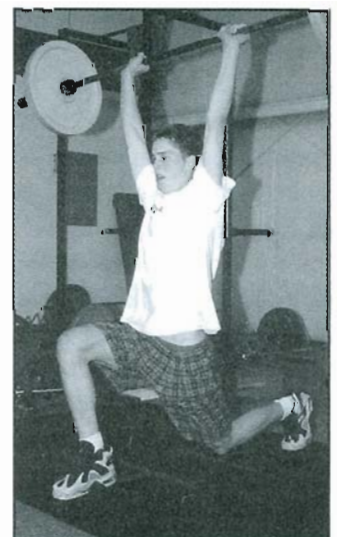
Pull phase of Clean & Jerk



Squat Snatch phase of the Clean



Transition phase of Split Jerk



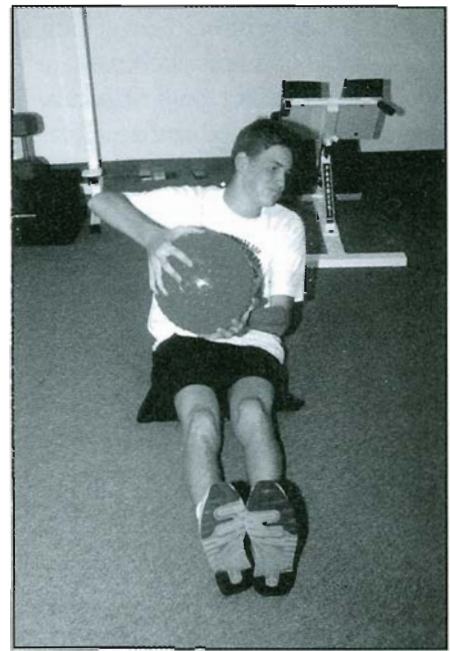
Receiving position of the Jerk

Luke, demonstrates several different phases of various quick lifts.





Training with a medicine ball, Luke and Diana do the "Over & Under" drill.



Tim demonstrating the medicine ball Seated Throw

Many athletes and coaches are ill-informed on how to increase the energy capacity for an athlete involved in a sport dominated by high intensity power movements. Most school sports are anaerobic with the ATP-PC & LA energy systems supplying more than 80% of the energy demands. Unfortunately, many coaches believe doing aerobic distance running prepares the athlete for the fourth quarter? Scientific research has shown that the "aerobic base" contributes little indeed to a player's performance in sports such as basketball, volleyball, wrestling, soccer, football, or tennis. It is helpful for those running 800 meters and up. When the player's success is determined by speed and power, a more productive conditioning plan would be based upon interval training principles. Work periods must be very intense, but short. Adequate rest must be provided to maintain high intensity power movements. The most common error in interval training is making the rest interval too short. Interval training works very well with speed and running

drills. It is also highly adaptable to all explosive exercise, especially olympic lifting movements and plyometrics. Remember, take the time for adequate rest to maintain game-like quality and get 20-40 minutes of training for maximum gains. Progress gradually.

Summary

Our training is totally within these principles. It is centered around the squat exercises for strength, the pulling movements for power, and plyometric movements for speed. We have found the back squat develops the organism, the front squat and single leg variations develop the athlete. With the pulling movements we do mostly variations and combinations of the clean and jerk and the snatch. Remember, the goal is athletic performance, not necessarily to get your name on the record board. We have found it productive to do most of our Olympic lifts from the hang position and keep the intensity between 55% - 70%. From the floor, we usually do the pulling

phase only. When plyometric drills are kept short and intense with good coaching feedback, they produce remarkable speed improvement.

The entire program is working together. It is often difficult to tell where one thing ends and another begins. That, too, is the way it is in competition. Workouts are 55-70 minutes in length. Everything but certain abdominal work is done while standing and using free weight. Our athletes leave sweaty, tired, but mentally stimulated. Each workout day is different and program changes are frequent to encourage mental and physical adaptation.

Using these principles enables the athlete to develop powerful legs and torso. Joint isolation can produce extremely strong limbs, but keep the goal in mind. Consider the tree for example; huge, strong limbs are of little value when the storm comes. If the roots and/or the trunk are weak, the tree falls. In athletics, the storm is inevitable; build from the bottom up!.....□



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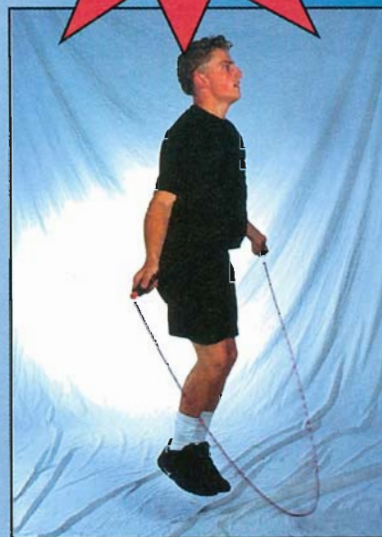
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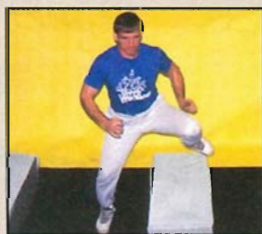


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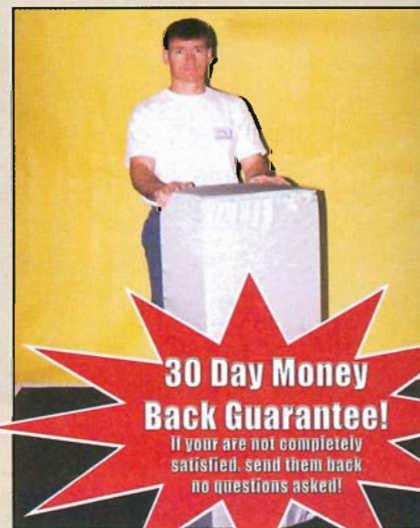
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