

Strength Training For Power

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Power is the rate at which work is performed. Power is also defined as force multiplied by velocity. For example, moving a heavy weight very fast requires more power than moving that same weight slowly. In athletics, both power and strength are visible qualities in all motions. Some sport coaches view strength as the ability to resist injury or fight for proper position on the field such as boxing out and rebounding in basketball. Power, on the other hand, may be viewed as speed of movement or quickness in running or jumping.



To get the most “bang for your buck”, training programs should take into account the individuality of the subjects being trained. In relation to power, it is my empirical observation that if the subjects being trained lack general strength, they should work to develop this first in order to gain the most benefit from subsequent power training.

If we look at the strength variables of two athletes, it will be easy to understand. For the sake of this illustration, both athletes are 6'2" tall and weigh 250lbs. Athlete #1 is a novice shot putter with little strength training experience. Athlete #1's weightlifting variables are as follows: bench press 185lbs., squat 250lbs., and power clean 185lbs. Due to this athlete's lack of training experience, his strength is poor for someone his size. This athlete first needs to develop general strength in order to make gains in power. General strength will allow him to hold correct posture during throwing and to aid in injury prevention. Athlete #1 would greatly benefit from

Fast vs Slow Lifting?

When selecting drills and exercises for power training you need to observe the speed of the exercise. For example, a well-known strength exercise like the deadlift may take 2 – 4 seconds to complete with an average to heavy load. In comparison, the full clean portion of the clean and jerk (power exercise) can be completed in as little as 0.09 second, with similar load requirements. Deadlifts or squats are not slow lifts, but they are slower than power cleans or snatches. Because velocity is an important component of power, it makes sense to utilize exercises such as power cleans or snatches which are fast by design.

more traditional strength exercises such as squatting and pressing movements. Also, these exercises should be performed during a hypertrophy phase where the volume (sets multiplied by repetitions) of training is high (4 – 6 sets, 20 – 8 reps) and the intensity [percent of a 1 repetition max (1RM)] is low (45% – 70%). This type of training is designed to increase lean muscle mass.

Athlete #2 has many years of sport and strength training experience. His training methods and goals should therefore be planned accordingly. This athlete should focus on exercises, which are fast by design and stimulate the central nervous system to excite and

recruit the working muscles quickly. Drills such as plyometric throwing with weighted medicine balls or Olympic style lifts should be the mainstay of the training regimen.

The thinking behind this type of training is that it is believed one of the main reasons we become more powerful is due to our central nervous system's ability to coordinate our working muscles to perform a specific skill. Also, without getting into too much detail, our muscles are comprised of both fast twitch motor units, and slow twitch units. For power, we want to recruit and train the fast twitch fibers.

Types of Exercises

Below is a list of five basic power drills, as well as a brief description. All are common, yet each exercise has many variations. It is my advice that you learn the basic drills first, and then move on to variations.

1. Power Clean
2. Power Snatch
3. Jump Squat
4. Box Jumping
5. Dumbbell Clean and Jerk

Power Clean:

This exercise is a modification of the full clean motion of the competitive clean and jerk lift. The idea of the lift is to move the barbell from the floor to the shoulder in one explosive motion.

Power Snatch:

This drill is similar to the power clean in many ways. Exceptions are that the grip is wider and the barbell is caught over the head. Again, the lift is executed in one quick motion.

Jump Squat:

This drill is a variation of the traditional Olympic style squat. The athlete stands with the barbell on his shoulders and proceeds to perform a regular squat. When the athlete moves from the downward to upward position, he is taught to push hard against the ground in order to "jump." The athlete then absorbs the jump in the next squat and repeats the next repetition. Special emphasis is placed on maintaining a firm grip on the bar and correct posture. Loads lifted are generally low, 15 - 35% of a squat 1RM.

Box Jumping:

There are too many variations of this drill to list. You can think of a box jump like a power clean or snatch. It requires a lot of power to move a heavy weight from the floor to your shoulders

or even overhead. It also requires a lot of power to move your bodyweight 3.5 - 5 feet from the floor to jump on a box. Start with the box height relatively low and increase the height once the athlete becomes comfortable with the exercise and has mastered the lower height jump.

Dumbbell Clean and Jerk:

This drill is a variation of the Olympic clean and jerk, except with one dumbbell in each hand. The lift is started from the floor with each weight turned so they are parallel with the athlete's feet. As the athlete moves from the floor, special emphasis is placed on keeping the back flat and protected. When the dumbbells reach knee height or slightly above, the athlete "jumps" the dumbbells to the catch position on the shoulders. The athlete then quickly bends their knees and reverses that effort in order to jerk (quickly extend) the dumbbells overhead.

Order of Exercise

During daily workout sessions, most power type exercises should be performed first. There are many logical reasons for this. Empirical observation shows that your nervous system is fresh and able to move your working muscles quickly in the beginning of a workout as compared to the end. Also, if an athlete has to perform an exercise like a back squat before a power clean, then the muscle of the back will most likely be too fatigued to hold correct posture during the more explosive power clean. This now becomes a potential safety problem. Therefore, if fatigue is present during power training, the athlete will struggle to complete the exercises safely let alone move with the desired power.

When to Train for Power

Strength and conditioning coaches often debate this subject. One thought is to train for power only during competition phases of training. Another is to train year round for power. It is my opinion that power training should be performed year round giving it a special emphasis during the in season competition phases. My reasoning is this. It takes many years to master complex power exercises like the snatch and power clean. Therefore, practice is needed. If athletes remove these exercises completely from training for weeks or months they effectively stop practicing them. Also, most high school aged athletes play multiple sports. Often their competition phase in one sport may run into a general conditioning phase in another. In this case, it would make sense to put a special emphasis on power training during the competition phase.

The following is a sample of a three-week competition phase. Remember, a general strength base should be established prior to serious power training.

Sample Competition Phase

DAY 1		
DRILL	SETS X REPS	PERCENT
Power Clean	5x2	90%
Squat	3x2/3x2	80%/90%
Lunge Walk	6x12	
Dumbbell & Jerk	5x3	
Box Jump	6x3	
Abdominals	4x20	

DAY 2		
DRILL	SETS X REPS	PERCENT
Push Press	5x2	90%
Bench Press	5x2	90%
Pull Down	5x5, 3x3	
High Pull	5x4, 2x2	70%/75%

DAY 4		
DRILL	SETS X REPS	PERCENT
Power Clean	5x1	88%
Power Clean to Front	3x3	80%
Squat		
Leg Press	5x3	125%/squat
Leg Curl	5x5	
25m sprint start	6x25m	

DAY 5		
DRILL	SETS X REPS	PERCENT
Narrow Grip Bench Press	6x3	90%
Pull Ups	40 reps	
Jump Squat	5x3	50% of Squat
Dumbbell & Jerk	4x3	
Abdominals	4x20	

DAY 8		
DRILL	SETS X REPS	PERCENT
Power Clean	3x2/3x1	88%/95%
Squat	3x1/3x1	90%/95%
Snatch Lunge Walk	6x12	
Double Step Up	6x12	
Box Jump	5x3	
Abdominals	4x20	

DAY 9		
DRILL	SETS X REPS	PERCENT
Push Press	2x2/3x1/3x1	90%/95%/85%
Low Row	5x5	
Bench Press	4 x 1	95%
Dumbbell shoulder Press	5x5	
Abdominals	5x10	

DAY 11		
DRILL	SETS X REPS	PERCENT
Power Clean	4x1/4x1	88%/80%
Romanian Deadlift	3x6	70%
Dumbbell Clean & Jerk	5x2	
High Pull	5x2	80%

DAY 12		
DRILL	SETS X REPS	PERCENT
Narrow Grip Bench Press	6x2	85%
Jump Squat	5x5, 3x3	40/50% of Squat
Pull Down	6x5	
Pull Ups	50 reps	
Dumbbell Clean & Jerk	4x3	
Abdominals	4x20	

DAY 15		
DRILL	SETS X REPS	PERCENT
Power Clean	3x2/3x1	88%/95%
Squat	3x1/3x1	90%/95%
Snatch Lunge Walk	6x12	
Step Up	6x12	
Box Jump	5x3	
Abdominals	4x20	

DAY 16		
DRILL	SETS X REPS	PERCENT
Push Press	2x2/3x1/3x1	90%/98%/85%
Low Row	3x8, 5x5	
Press Behind Neck	4x5	
Abdominals	5x10	

DAY 18		
DRILL	SETS X REPS	PERCENT
Power Clean	4x1/4x1	88%/80%
Romanian Deadlift	3x6	70%
Dumbbell Clean & Jerk	5x5	
High Pull	5x1	85%

DAY 19		
DRILL	SETS X REPS	PERCENT
Narrow Grip Bench Press	6x2	85%
Jump Squat	5x2	60% of Squat
Pull Down	6x5	
Pull Ups	50 reps	
Box Jump	4x3	
Abdominals	4x20	

Summary

1. When training for power, select exercises that are fast by design, such as Olympic lifts or plyometric jumps.
2. If general strength levels are poor, time should also be spent to develop this by performing strength exercises such as squats and presses.
3. Training for power should be performed year round giving it a special emphasis during competition periods.

About the Author

*Roger Marandino, MS, CSCS*D earned a master's degree in sport biomechanics from the University of Connecticut. He competed on the national level in the sport of drug-free power lifting, winning three national titles, and is a USWF Olympic Weightlifting Coach. Marandino was the strength coach of the year for the Ivy League in 1997.*