

# Developing an Explosive Athlete

Webquest for Athletes

Created by Nick Marshak of Adelphi University

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## Introduction



**Do you want to be stronger and faster than your opponents?  
Do you want to take your game to the next level?**

To compete at your very best, you need to build the appropriate strength, power and speed elements into your conditioning regime. That's what gives you the extra edge you need to excel at your sport. Power training enables an athlete to apply the greatest amount of their maximal strength in the shortest period of time. Making your body more efficient in moving objects quickly will greatly enhance performance and allow you to compete at the highest level.

Speed in the development of force is crucial to success in sports activity. Abilities such as running fast, jumping high, and throwing far and fast are all related to the ability to develop and impart forces quickly. All athletes seek to be the best, but they may not understand that they must develop those abilities over time and choose appropriate means for doing so. Even those who possess the physical characteristics that others only wish they had must develop and refine their abilities if they want to be at the top of their game.

## Tasks

1. Develop an understanding of how certain aspects of explosive training helps increase power output using the internet and other resources
2. Incorporate power training into your workout. Continue strength training but add speed/power training to help further develop your abilities.
3. Record data to show improvements in strength and speed. If possible, have a partner test you in specific areas of training such as the vertical jump, 40 yd dash, bench press and squat. This will help show areas in which improvement can be made. Continue your education of specific exercises that can improve performance



## Process

1. Explore websites and books to generate knowledge of power training. Some examples of websites are as follows:

<http://www.sport-fitness-advisor.com/power-training.html> : This website will provide you with some general information about how our bodies generate power and the benefits of training for increased power in athletics

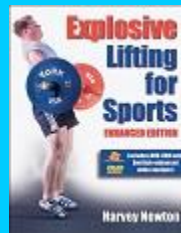
<http://www.exrx.net/Lists/PowerExercises.html> : This website is great for learning different strength training exercises and provides a detailed description which makes learning the exercises easy.

<http://www.sport-fitness-advisor.com/agilitydrills.html> : This website is a great source to help you get started with your speed training. It gives you general guidelines as well as sample drills

<http://www.coreperformance.com> : Using the free trial version, core performance develops a workout program specific to your individual needs. They incorporate all aspects of training from warm-up to cool-down. This is a great website to use if you are confused on how to start a program.

Books that can be useful:

*A. Explosive Lifting for Sports-  
Enhanced Edition*



Author: Harvey S. Newton

This book and DVD-ROM package demonstrates the safest, most effective learning progressions for the snatch, clean, jerk, pulling assistance exercises, squat, and other lifts. Perform each lift safely with step-by-step instructions and develop the strength, power, and speed you need for your specific sport. Included are specific power-development programs for 10 different power sports: football, baseball, basketball, soccer, volleyball, hockey, track and field, wrestling, racket sports, and competitive weightlifting.

*B. Sports Power by David Sandler*

*Sports Power* provides all the tools to build sport-specific power and allow you to attain the highest level of performance.

2. My philosophy on training for explosive power is that athletes best develop it by focusing on multi-joint, ballistic weightlifting exercises such as cleans, snatches, push presses, and various forms of jump squats. The purpose of these types of lifts is to teach the athlete to initiate force with maximal effort against a maximum or near maximum resistance.

Once the athlete has learned the skills associated with these exercises and can adapt them into a training program, the next step is to add plyometric training. Plyometric training is designed to teach the muscular system of the athlete to develop maximal forces over a brief period of time.

The final ingredient in the process of developing the explosive athlete is speed training. For sports performed on courts and fields, coaches and trainers speak of sprint training, which should be an important element in the development of any athlete.

Generate an explosive training program that incorporates all aspects such as Olympic lifts (cleans and snatches), plyometrics, and speed training. You can use [www.coreperformance.com](http://www.coreperformance.com) to help guide you through the process or you can produce your own workout by using the previously researched material. Using a program such as Microsoft Word or Microsoft Excel, you can organize your routine which will make it easy to follow. The following is an example of how a table can be designed:

Exercise	Sets	Reps	Rest	Instruction
Overhead Med Ball Throw	3	8	2 min	Using a medicine ball, hold ball overhead. Throw the ball using entire body to generate force
Clean and Jerk	4	5	5 min	

3. Perform the following tests to help determine where you stand as compared with other individuals of your gender. This will help you see any improvements as well as any areas of improvement.

Use these speed and power tests before you begin your training program and then at 6-8 week intervals. Follow these general guidelines to make the tests as safe and effective as possible...

- Warm up thoroughly before you begin with a few minutes of light jogging and stretch to all major muscle groups.
- Short explosive power tests such as the vertical jump should be performed first in the test battery and at the start of a training session.
- Avoid training the day before, especially heavy weight training which will have a significant effect on your power.

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### 30m Sprint - Short Term Power Test

This test measures your ability to accelerate to full speed quickly, as well as reaction time...

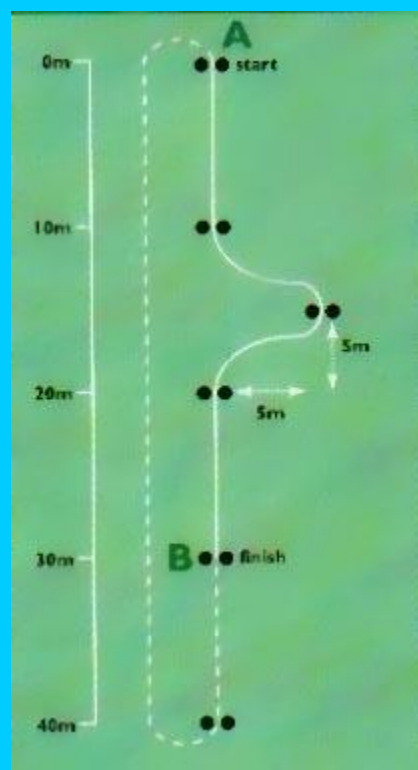
1. Set 2 cones 30m apart and start at one cone.
2. On a signal of "Marks - Set - GO" sprint to the other cone as quickly as possible.
3. Have a training partner record your time with a stop watch.
4. Perform 3 trials and take the **best** time.

Any time less than 5 seconds is good. Less than 4 seconds is excellent.

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### 30m Sprint Fatigue - Power Maintenance Test

In many multi-sprint sports such as basketball, hockey, rugby and soccer, players often have to reproduce sprints in quick succession. The ability to recover between sprints and produce the same level of power over and over is a measure of your **sprint fatigue**.



For this test you need 12 cones or markers and a stopwatch. Look at the diagram below to see how to set the cones out...

1. Sprint from **A** to **B** between the cones deviating 5m sideways in the middle of the sprint. Have a training partner start you off and time your sprint from A to B.

2. Jog slowly for 10 meters after point B and then back to the start taking **30 seconds** to do so.

3. As soon as you reach the start repeat the sprint.
4. Complete a total of 10 sprints and have your training partner write down all the times.
5. Subtract your fastest time from your slowest time. This is your **sprint fatigue**. For example if your slowest sprint was 7.8 seconds and your fastest sprint was 6.9 seconds your sprint fatigue is 0.9 (7.8 - 6.9).

Another useful tool to use with your results is to find the average speed of the **first three trials** and divide it by the average speed of the **last three trials**. So if your times were...

**7.1s, 6.9s, 6.9s, 7.0s, 7.2s, 7.1s, 7.3s, 7.3s, 7.4s, 7.5s**

The average of the **first 3** times is **6.97s**, the average of the **last 3** times is **7.40s**.

$$6.97 \div 7.40 = 0.94 \times 100 = \mathbf{94\%}$$

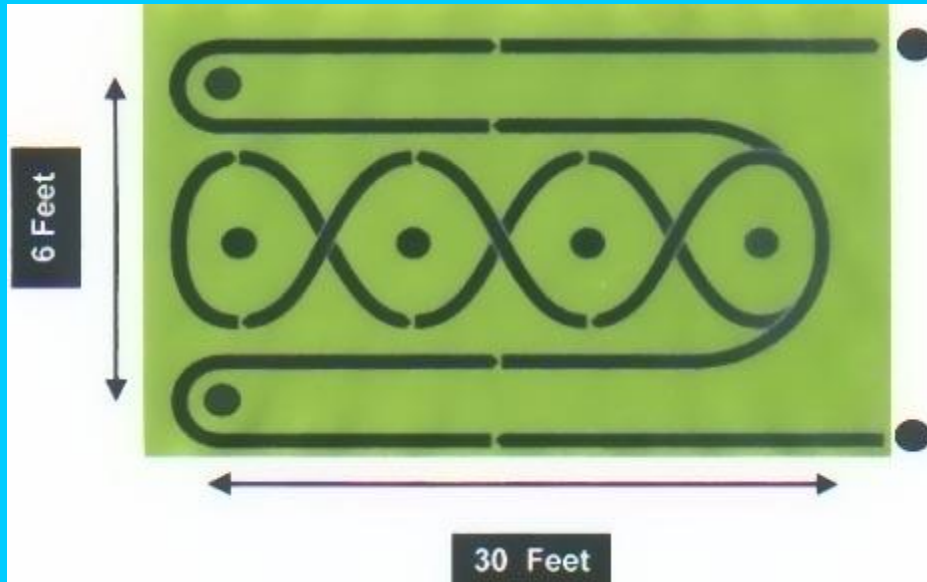
Compare you score with the table below...

Power Maintenance		
Level	Category	% Top Speed Maintained
1	Excellent	+90%
2	Good	85-89%
3	Average	80-84%
4	Poor	<79%

### Illinois Test - Agility

This test measures your ability to change direction quickly, in other words your **agility**

You will need 8 cones and a stop watch. Look at the diagram below to see how to set the cones out...



1. Sprint the course from start to finish and have your training partner record your time.
2. Rest fully and repeat the test for a total of 3 trials. Take your quickest time and compare to the chart below.

<b>Power Maintenance</b>		
<b>Classification</b>	<b>Males</b>	<b>Females</b>
Excellent	<15.9 secs	<17.5 secs
Good	15.9 - 16.7 secs	17.5 - 18.6 secs
Average	16.8 - 17.6 secs	18.7 - 22.4 secs
Below Average	17.7 - 18.8 secs	22.5 - 23.4 secs
Poor	>18.8 secs	>23.4 secs

### **Standing Long Jump - Explosive Power**

Along with the vertical jump, this power test is used to measure explosive power...

1. Stand at a mark with your feet slightly apart.
2. Taking off and landing with both feet, swing your arms and bend the knees to jump forward as far as possible.
3. Measure the distance, rest fully and repeat a total of 3 times. Take the longest of the 3 trials as your score. Compare your results with the table below...

Standing Long Jump Test					
	Poor	Below average	Average	Good	Excellent
Males	<2.0m	2.3m	2.5m	2.7m	>3.0m
Females	<1.7m	1.9m	2.2m	2.5m	>2.8m

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### Standing Vertical Jump - Explosive Power

One of the classic power tests. This is excellent for basketball and volleyball players but it's certainly not just limited to those athletes. If your sport involves jumping this test applies to you...

1. Chalk your hand and stand next to a wall. Reach up with your hand closest to the wall and make a mark. Remember to keep your feet flat on the floor.
2. Bending your knees at right angles, jump as high as possible to make another mark.
3. Measure the distance between the two marks and repeat a total of 3 times. Take your best score of the 3 trials.

Jump height can be converted into a power using the following formula...

$$\text{Power} = \text{Body mass(kg)} \times (4.9 \times \text{height jumped in meters})^2$$

So for example if you weigh 80kg (multiply your weight in lbs by 2.2) and jumped 50cm (0.5m) your score would be...

$$80 \times (4.9 \times 0.5)^2$$

$$= 80 \times (2.45 \times 2.45)$$

$$= 480\text{kg-m}$$

Going back to your original score (the height you jumped) compare it to the graph below...

Vertical Jump Test					
	Poor	Below average	Average	Good	Excellent
Males	<46cm	50cm	55cm	60cm	>65cm
Females	<36cm	40cm	45cm	50cm	>55cm

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## Hexagon Drill - Quickness

This drill was developed by the US Tennis Association as part of their player assessment program. It is useful for all kinds of athletes to measure their agility, quickness and coordination.

1. Mark out a hexagon on the floor with tape or chalk. Each side should be **24 inches** long with a **120 degree angle**. Avoid hard surfaces such as concrete.
2. Stand inside the hexagon opposite one of the sides. Keeping your feet together, jump across the side you are facing and then immediately back into the middle of the hexagon.
3. As soon as you land jump over the next side of the hexagon. Continue until you have completed 3 full revolutions of the shape. You can go either clockwise or anticlockwise.
4. Have someone time you. There is no data to compare this test to so keep a note of the time to beat on your next testing day.

## Evaluation

Using the results from the previous tests, rate yourself using the table below for each test performed. Comparing your scores to the data given will help you determine the level of performance in which you fall.

	Excellent	Satisfactory	Needs Improvement
30m Sprint			
30m Sprint Fatigue			
Illinois Test			
Standing Long Jump			
Standing Vertical Jump			
Hexagon Drill			

After evaluating your results, be sure to make any adjustments to your program (i.e. intensity, frequency, time, type) which will correct any discrepancies or help improve on your weaknesses. Remember, you are only as strong as your weakest link. Try to refrain from over-developing your strengths and continue to develop your weaknesses.

## Conclusion/References

Maintaining your program is vital to success on the field. Developing a sound routine that incorporates all levels of training will help make you a better athlete and will improve your on-field performance. Be sure to utilize all resources when generating a program, such as websites, books, or talking to strength and conditioning professionals. The more information you obtain, the easier and smoother your training sessions will be. So be safe, be well, and good luck on your journey to success!!!

1. <http://www.sportsspecific.com/public/334.cfm>
  2. <http://www.exrx.net/Lists/PowerExercises.html>
  3. <http://www.sport-fitness-advisor.com/power-training.html>
  4. <http://www.coreperformance.com>
  5. <http://www.bodybuilding.com>
- <http://www.sport-fitness-advisor.com/agilitydrills.html>



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