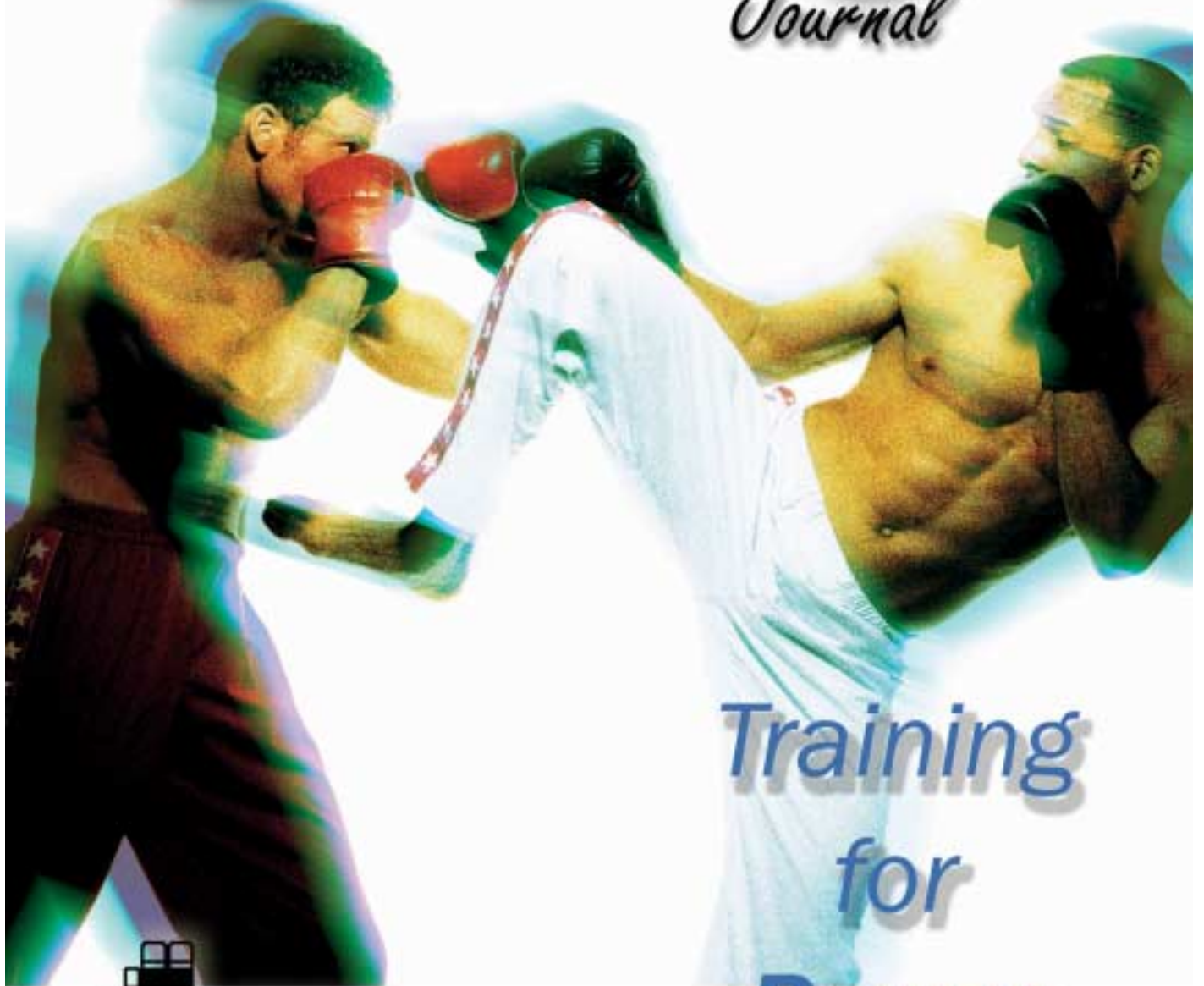


NSCA's
**Performance
Training**
Journal

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**Training
for
Power**



Volume 1, Number 6 Contents

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NSCA's Performance Training Journal

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Mission

As the worldwide authority on strength and conditioning, we support and disseminate research-based knowledge and its practical application to improve athletic performance and fitness.



Mental Skills Assessment

Do you use mental skills to enhance your performance in sport? To answer this question, you

need to know what the term “mental skills” refers to; that is, you need to know the mental skills that relate to enhanced performance.

A group of international sport psychologists worked together to develop an inventory to measure athlete’s use of mental skills. In the development of this tool, a critical step was figuring out what mental skills to measure. The question asked by these researchers was, “What mental skills positively influence performance in sport?” By studying elite level athletes, the scientists were able to uncover the mental skills that these athletes used to achieve success—it is these skills

that were integrated into this inventory. To understand if and how well you make use of mental skills in sport, you need to start by assessing and evaluating how well you use the skills that are implemented most often by elite level athletes.

So, are you up to it? Are you ready to test your mental skills/ abilities? The following questions are adapted from the mental skills inventory and will help you assess your use of the mental skills that have been found to enhance performance in elite athletes. Certainly, elite athletes don’t use all the mental skills all the time. But, they consistently make use of some of these skills in practice and competition to help manage the mental aspect of their performance. The intent of this exercise is to get you to think about how you use psychological skills and how effective (or ineffective) they are for you.



Arousal/Energy management

Elite athletes use various mental skills and strategies to manage their physical and mental energy. This requires using strategies for relaxation and activation (to get your body “fired up”).

- Are you able to increase your energy when feeling lethargic or flat?
- Do you effectively psych yourself up to get ready to practice or compete?
- Are you able to relax if you get too nervous?

Imagery

As you’ll remember, this skill was discussed in detail in the Golf (volume 1, number 3) issue. Imagery involves creating or recreating an athletic experience in your mind.

- Do you imagine specific skills in practice and/or competition before skill execution?
- Do you mentally rehearse the feel of performance?

Goal Setting

This is an important strategy for planning and tracking your performance level. Both short-term and long-term goals and process and outcome goals are important for maximizing performance. Elite level athletes set both types of goals in their training and competition.

- Do you set long-term and short-term personal performance goals?
- Do you evaluate your progress towards your goals on a consistent basis?

Self Talk

As discussed in an earlier issue, this skill relates to managing what you mentally say to yourself during practice and competitions to facilitate performance.

- Do you talk positively to yourself? Are you your own best friend?
- Do you purposefully manage what you say to yourself in practice and competition?

Emotional Control

Elite athletes are characterized by an ability to manage their emotions effectively. This means being able to deal with frustration and negative emotions and get on with the business of performing.

- Are you able to manage your emotions under pressure?
- When something upsets you, does your performance suffer?

Attentional Control

This skill focuses on concentration, or the ability to maintain focus on relevant cues, and is a critical mental skill to train since distractions are commonplace in most athletic endeavors.

- Does your attention wander during training?
- Are you able to focus your attention on effective performance cues?

Negative Thinking

Elite athletes use specific skills to deal with negativity and to mentally get back on track following a mistake or distraction.

- Are you able to refocus when distracted?
- Do you have thoughts of failure or images of screwing up?

How did you do? Are you pretty good at managing your images, self-talk, attention, emotions, energy and using them as an asset to performance? Read through the questions again to identify mental skills that would be beneficial for you to address. Seek resources to help in areas you identified as needing improvement—and stay tuned to this monthly feature, as I’ll be addressing these and other mental skills.

About the Author

Suzie Tuffey Riewald received her Master’s and PhD in Sport Psychology/Exercise Science from the University of North Carolina-Greensboro. She has worked for USA Swimming as the Sport Psychology and Sport Science Director, and now is Associate Director of Coaching with the USOC where she works with various sport national governing bodies (NGBs) to develop and enhance coaching education and training. Additionally, Suzie is an NSCA-Certified Personal Trainer.

Hypertrophy Training = Volume

Hypertrophy is simply the term we use to define the process whereby muscles enlarge and thereby produce greater force. This muscle enlargement is particularly valuable to athletes concerned with performance in events requiring strength and power. Obviously, resistance training is the key to hypertrophy, but the workout must be framed properly to insure we meet our goal. There are two questions we need to answer during this discussion. First, what really happens at the cellular level to produce hypertrophy and second, what type of resistance training should we engage in to maximize hypertrophy?

Cellular Adaptations

Before we begin to look at how to train it is desirable to take a quick look at what is actually occurring deep inside the muscle during resistance training. In earlier columns we have discussed the structure of muscle fibers and examined the small filaments that make up muscle fibers. The main protein elements of muscle contraction are the small actin and myosin filaments that together create the sliding cross bridges that produce force. There are thousands of these filaments in every muscle and simply stated, the more cross bridges that are attached the greater the force and power output capabilities. Following resistance training, the body adapts by increasing muscle cross sectional area through an increase in the SIZE of actin and myosin filaments². This results in the addition of sarcomeres (the basic contractile package) to existing muscle tissue. It should be noted that there is probably no increase in the actual number of muscle fibers, but rather only an increase in their size⁴. Furthermore, these increases occur in a selective manner primarily to fast twitch muscle fibers and may take as long as eight weeks to become evident¹.



Type of Training

Now that we are aware of the actual process the muscle undergoes to produce hypertrophy, it is time to investigate what type of program we should engage in to maximize those size increases. Clearly, it requires repeated repetitions of a lift in order to gain muscle size. But, how many, how often and how heavy? The key to this equation is volume². Volume is most easily defined as the number of sets of an exercise multiplied by the number of repetitions (sets x reps). In other words, performing three sets of 10 repetitions would result in a volume of 30. This is the simplest way to track resistance training over a period of days and weeks. Implicit in this volume discussion however, is the fact that a set of 10 is performed with a resistance that allows no greater than 10 repetitions to be completed and is not merely terminated because an arbitrary goal number of repetitions has been reached⁵. In short, the resistance must be equal to the task in order for the equation to fit our hypertrophy/volume model.

Hypertrophy is most efficiently produced through high volume exercise which is a result of several sets of an exercise—usually between three and five sets of eight to 20 repetitions. This type of training will obviously require a relatively low intensity as measured by the actual resistance lifted⁵. It is the repeated use of sets and reps that stimulates the body to adapt by increasing muscle size and thereby strength.

Conclusion

In the final analysis the key to resistance training is volume. Specific goals may be reached through the use of specific sets and reps³. If hypertrophy is the goal of your exercise regimen then plan to increase your volume by performing 3 - 5 sets along with 8 - 20 repetitions and realize it may take as long as two months for results to appear.

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About the Author

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Fitness level found vital in men's death risk . . .

The fittest may indeed survive the longest, according to new research suggesting that physical fitness is more important in death risk than even high blood pressure, high cholesterol or smoking. The study of more than 6,200 US men who underwent treadmill testing for cardiovascular disease found that the risk of death over the next six years declined as exercise capacity rose. This was true of both men with cardiovascular disease and those whose exercise tests were normal. In fact, researchers report in *The New England Journal of Medicine*, exercise capacity was the best predictor of death risk among men with cardiovascular disease. And among all participants, those in the group with the lowest exercise capacity were about four times more likely to die during the study period compared with the fittest group. Overall, fitness mattered more in death risk than such classic cardiovascular risk factors as high blood pressure, smoking and body mass index, according to Dr. Jonathan Myers and his colleagues at Stanford University and the Veterans Affairs Palo Alto Health Care System in California. For instance, a man who had high blood pressure but was among the fittest was about half as likely to die as a man with high blood pressure and low fitness levels, the report indicates.

The New England Journal of Medicine. 346:793-801, 852-853, 2002

Caffeinated drinks can lead to bone loss . . .

Caffeinated carbonated beverages may increase the risk of bone fracture among women. Researchers investigated the effect of caffeinated and noncaffeinated beverages on urinary calcium excretion in 30 women aged 20 - 40 years old. The subjects drank from two to seven 12-ounce cans of carbonated beverages daily; 27 drank predominantly colas. Significant increases in urinary calcium excretion resulted from consumption of only caffeinated drinks. Researchers said the main cause of calcium loss was the beverages' lack of nutrients needed for bone health. The skeletal effects of carbonated beverage consumption are likely due primarily to milk displacement.

American Journal of Clinical Nutrition 74 (September 2001): 343-347

L-carnitine L-tartrate helps with recovery . . .

In the ongoing quest to produce and test supplements that improve performance and recovery, researchers have discovered another substance that may be of interest to hard training athletes. L-carnitine L-tartrate supplementation seems to decrease the amount of muscle disruption that occurs after high-repetition resistance training, and enhance muscle recovery. Researchers at the University of Connecticut, Storrs, CT, examined the influence of L-carnitine L-tartrate supplementation on markers of catabolism, free radical formation and muscle tissue disruption after squats. Ten resistance-trained men took a placebo or L-carnitine L-tartrate supplement (2 grams/day) for three weeks. Blood samples were taken on six consecutive days; blood was also tested before and after a five-set squat protocol of 15 - 20 repetitions on the second day of supplementation. Before training on days three and six, muscle tissue disruption was measured at mid-thigh using magnetic resonance imaging (MRI). The researchers noted that L-carnitine L-tartrate supplementation decreased plasma indicators of muscle breakdown, and the amount of muscle disruption during supplementation was 41% - 45% of the disruption with the placebo. That means the L-carnitine L-tartrate supplementation somehow protected the muscle tissue from more severe disruption and damage than often occurs under normal circumstances.

American Journal of Physiology (Endocrinology & Metabolism) 282(2).E474-482, 2002

About the Author

Edmund R. Burke, PhD, CSCS, is Professor and Director of the Exercise Science Program at the University of Colorado at Colorado Springs. He served as Coordinator of Sports Sciences for the U. S. Cycling Team leading up to the Olympic Games in 1996 and was a staff member for the 1980 and 1984 Olympic Cycling Teams. Dr. Burke is a Fellow of the American College of Sports Medicine and a Certified Strength and Conditioning Specialist (CSCS) with the NSCA. He has authored or co-authored fifteen books on training, fitness and nutrition.

Overview of Power Training

Paul Fleschler, CSCS

Since power and the qualities that make up power—speed and strength—are vital in all areas of sport, coaches and athletes are constantly looking for ways to improve them. This article will focus on ways to increase power through external resistance methods, and the components that go into a successful power training program: consideration of energy systems, general physical preparation, and the specific training methods.

Energy Systems

Knowledge of the primary energy systems of any particular sport is of importance when designing strength and conditioning programs. A coach who designs a training program for an athlete involved in an event that derives its energy from the ATP-CP system must design programs which primarily stress this system. When training to increase power through lifting, the athlete will spend the majority of time stressing the ATP-CP system. Well-designed training programs are necessary to improve metabolic efficiency.

A wide range of forces are required when performing different athletic movements, depending on the movement and the situation. The athlete's ability to grade or vary the force application is an important factor in proper movement. Concerning these factors, we will limit the scope of our discussion to the following areas which result in neuromuscular adaptation: intra-muscular and inter-muscular coordination.

Intra-muscular Coordination

The amount of force produced during a muscle contraction can be varied or graded by

1. varying the number of motor units involved in the movement (motor unit recruitment),
2. by changing the frequency at which the motor nerves fire (frequency coding), or

3. a combination of these factors.

Inter-muscular Coordination

Most athletic movement requires complex coordination and efficiency of numerous muscle groups. There must be coordination between the muscles responsible for movement through contraction—the agonists or prime movers—and the muscles responsible for opposing movement—the antagonists.

General Physical Preparation

Before beginning a program that emphasizes sport specificity, a general assessment of the athlete is encouraged. The athlete should possess basic strength measures before beginning a comprehensive program designed to increase power development. Athletes must be able to lift their own body-weight for several repetitions with good form in a variety of exercises. Some basic resistance exercises include body weight movements like pull-ups, push-ups and an array of core exercises. Exercises such as squats, lunges and step-ups are also important. These exercises can be completed a minimum of twice a week for multiple sets. Once the athlete reaches a general strength level, the coach can implement a power development program. This guideline will help prevent injuries and the athlete will benefit over the long run.

Training Methods

The concept of power has to do with developing large forces at high rates of speed. This can be very specific; but generally, one can divide power into two areas of movement. The first is speed-strength where the importance is on speed of movement against a relatively small resistance, such as plyometric or ballistic training.

The second case is strength-speed where there is a quick application of force against a large resistance, such as Olympic lifting movements. As we consider the multi-joint Olympic movements, it becomes obvious that we must have precisely timed contraction and relaxation of opposing muscle groups to provide smooth, fluid movement and force application. This is why the Olympic lifts are so effective at building inter-muscular coordination.

Olympic Lifts

The Olympic lifts:

- Are done standing
- Involve the majority of the body's musculature with each repetition
- Are closed-kinetic chain exercises making them functional and sport specific
- Are supported by one's body
- Develop the synergists muscles
- Require the muscles to fire in an impulse fashion
- Focus on timing, coordination and balance with each repetition
- Stress the ground based action/reaction principles for many sports
- Are unequaled by any other form of training for power production

moment of force application. Both of these qualities are vital in most sports.

Athletes can increase RFD and starting power in several ways. In addition to doing the Olympic movements from the floor, the athlete can perform them from an unloaded position from blocks or from a loaded position, slightly above the knee. These will not only add versatility for the athlete but also variety to prevent staleness.

The Olympic lifts are the Snatch and Clean and Jerk, but the term is also often used to refer to a number of common variants on these two exercises, such as Power Snatch and Power Clean.

Power Snatch

The power snatch is one of the fastest and most explosive movements in sport. The athlete must lift the bar with a wide grip from the floor to the overhead position in one dynamic movement. The snatch is the more technical of the two

// It is common knowledge that football, basketball, volleyball and other high-intensity oxygen-independent sports have high elements of power. However, even athletes in oxygen-dependent sports incorporate some elements of power during performance. //

Since virtually all sports have some element of power, the Olympic movements can benefit these athletes. It is common knowledge football, basketball, volleyball and other high-intensity oxygen-independent sports have high elements of power. However, even athletes in oxygen-dependent sports—such as triathletes, 5,000-meter runners and distance swimmers—incorporate some elements of power during performance. This is most noticeable during the beginning of races when athletes jockey for position, during the middle of races when the tempo increases, and during the final sprint to the finish line.

The Olympic lifts can also assist with explosive power and starting power. Explosive power refers to the rate of force development (RFD) or the ability to generate maximal muscle tension in a very short period. Starting power is the ability to develop the greatest possible force at the initial

Olympic movements; however the athlete must possess more than just strength and efficient technique. Speed, agility, balance, coordination, flexibility and kinesthetic awareness are other qualities needed to be efficient in the Olympic movements. These other qualities are important to athletics and are enhanced by training with the Olympic lifts.

Power Clean

The power clean is also a dynamic, ballistic movement designed to increase power production. More weight is lifted in the power clean than the power snatch. To perform the power clean the athlete grips the bar with a grip just outside of the shoulders and lifts the bar from the floor directly to the shoulders in a smooth, dynamic fashion. Although the power clean is not as technical as the power snatch, the two lifts share many of the same qualities.

Ballistic Training

Ballistic training represents a training situation where the athlete is overcoming a small resistance at a high speed of movement. The emphasis is on dynamic movements with continuous acceleration throughout the range of motion. This training improves the coordination between agonists and antagonists. Common examples of this type of training involve the use of medicine balls, heavy shots or kettle bells. Here, the work is in the range of 3 - 5 sets of 3 - 5 repetitions with the emphasis on fast and explosive speeds of movement.

Plyometric Training

Plyometric training is a method of training used to improve explosive strength and reactive ability. It utilizes a rapid stretching or loading of the muscles followed immediately by a maximal voluntary contraction of the same muscles. The most common applications of this method are in the use of depth jumps and medicine balls. These training methods have become very popular in recent years and seem to be the center of much controversy. This method is often misapplied or misused. This type of training has a significant effect on the neuromuscular system, and can be very fatiguing to the nervous system. Exercise selection, repetitions and rest intervals is important to avoid overuse and excess fatigue.

The inability of the athlete to absorb the forces produced through plyometrics has an inherent risk. Proper preparation of the athlete is crucial in minimizing potential injury. A preparation period utilizing general physical development training such as low impact jumps, ankle jumps, jump rope, core training, leg and hip strengthening is important for more intense plyometrics.

Getting Started

We cannot emphasize strongly enough the importance of working with an accredited coach who can oversee all aspects of power training. These exercise, while holding the potential for vast improvements in performance, are often misapplied, which can lead to injury. A certified coach will reduce the possibility of injury to the athlete while maximizing athletic potential. Certified coaches can be located through the NSCA at www.nscalift.org or for more weightlifting information, visit the USA Weightlifting website at www.usaweighting.org.

Power Training Using Dumbbells

Peter Melanson, MS, CSCS

As we all know, the benefits of Olympic style exercises are probably the single best mode of training to develop power for just about any athlete, sport, or activity imaginable. The benefits of this type of training include: Injury prevention, increased performance, core stability, explosive power, speed of movements, balance, coordination, kinesthetic awareness, sport specificity, and good use of time as a total body exercise. These are but a few of the advantages; there are numerous other qualities that can be developed with this type of training mode as well.¹

At the Air Force Academy we rely heavily on this type of training, especially with our football program, as well as with many other sports where the above-mentioned attributes are required for favorable outcomes on the field of play. At the Academy we place a major emphasis on training sports movements, not just muscle groups or exercises that are tested to demonstrate “strength.” Our major focus is to develop **athletes**, not weightlifters. With this in mind, we believe that the ability to develop power is extremely important but developing great balance and coordination is just as important to our athletes’ performance and success.

With this in mind we get to the emphasis of this article concerning Dumbbell Olympic Exercises and its benefits with relation to power development and athleticism. Performing these exercises with dumbbells adds another dimension to our training program with some specific advantages including: greater balance and coordination requirements as compared to barbell training, variety of training, greater specificity of training with the ability of unilateral movements, greater muscular control and kinesthetic awareness, increased recruitment of stabilizing muscles enhancing joint

stability, greater ranges of motion, and can be safer than some of the other exercises available just to name a few.² This is why we place such an emphasis on dumbbell training in our program design.

In the article we will use several exercises to accomplish this goal of not only developing power but athleticism as well. The three main exercises are Dumbbell Cleans, Dumbbell Snatch, and Dumbbell Jerks. Then we will take these three exercises and build upon them to emphasize not only power development but also greater increases in balance, coordination, athleticism, and sport specificity. These exercises include Dumbbell Alternate Clean, Dumbbell Alternate Foot Alternate Snatch, and Dumbbell Alternate Foot Alternate Jerk. I will explain how to successfully perform these exercises with an emphasis on proper technique and common mistakes that occur during execution.

The exercises are broken down into three distinct phases: the start position, execution phase, and catch phase. Each phase emphasizes proper positioning, technique, and coaching keys as well as common mistakes to avoid while teaching the exercises. There will also be pictures showing proper—or sometimes improper—positioning associated with these exercises. An important point to note when teaching Olympic style lifts is that exercise technique is paramount. Hopefully, you will be able to take these exercises and apply them to your programs for not only greater power development but increased athleticism as well.

We do most of these lifts from the hang position or the floor just as with barbells—with the exception of performing Dumbbell Jerks, which start with the dumbbells on top of the shoulders. When performing dumbbell lifts from the hang position we place the handle of the dumbbell at kneecap level (**See Figure 1**). When performing dumbbell lifts from the floor position, the handle of the dumbbell is placed at the mid shin level just as it would be using a barbell (**See Figure 2**). I like to have the dumbbells positioned at the side of the knee or shin instead of in front where the barbell would be. This makes it much easier to perform the exercise correctly as well as making it safer to get in the catch position.

Dumbbell Cleans

Start Position: See Figures 1 & 2

1. Feet should be in a good jumping position (narrow jumping width apart).
2. Sit the hips back in a $\frac{1}{2}$ - $\frac{1}{4}$ squat position, DO NOT bend the knees (they will naturally bend by emphasizing sitting the hips back).
3. Shins should be perpendicular to the floor.
4. Back should be straight and flat (with a natural dip in the lower back), and head up.
5. The shoulders should be positioned slightly in front of the kneecaps (same as when using a barbell).
6. The hands (dumbbells) should be on the side of the knees or shins.
7. This should put the athlete in a good jumping position to start the lift. See **Figures 1 and 2**.

Execution Phase: See Figure 3

1. Lift dumbbells explosively in a jumping motion by extending the hip, knee, and ankle joints.
2. At the end of the jump be sure to shrug the shoulders as well.
3. The dumbbells should stay close to the body and slide along the rib cage while keeping the face of the dumbbell parallel with the mirror.
4. Elbows should be kept high above the wrists.
5. This should allow the dumbbells to reach maximum height. The armpit is the desired height. See **Figure 3**.

Catch Phase: See Figures 4 & 5

1. As you start the downward motion into the catch position you should begin to rotate the elbows around and under the dumbbells.
2. Catch the dumbbells on the shoulders while lifting the elbows as high as possible (You should be able to see the point of the elbows in the mirror). See **Figure 4**.
3. Also during descent you should be sitting the hips backwards in a squatting motion to assist in catching the dumbbells under control.
4. Do not allow the knees to bend forward during the catch which will cause you to catch the dumbbells with elbows down and in a toe squatting position which will put undue stress on the patellar tendon. (Most of the weight should be on your heels). See **Figure 5**.
5. Once you are in a full squatting position, elbows high, good balance and under control, extend hips and knees to stand fully erect and complete the lift.



Figure 1 (above): Starting from the hang position

Figure 2 (below): Starting from the floor position





Figure 3 (above): Dumbbell Clean - Execution Phase

Figure 4 (below): Dumbbell Clean - Catch Phase (catch the dumbbells on the shoulders while lifting the elbows as high as possible)



Figure 5 (above): Dumbbell Clean - Catch Phase, incorrect form (do not allow the knees to bend forward during the catch, as this will put undue stress on the patellar tendon)

Figure 6 (below): Alternate Dumbbell Clean



Alternate Dumbbell Cleans

With Alternate Dumbbell Cleans, the only difference is to lift and catch one dumbbell at a time instead of lifting both dumbbells at the same time. Alternate between arms with each rep. The uninvolved arm remains at the side during the movement. **See Figure 6, preceding page.**

Dumbbell Split Snatch

Start Position: See Figures 1 & 2

1. Feet should be in a good jumping position (narrow jumping width apart).
2. Sit the hips back in a $\frac{1}{2}$ - $\frac{1}{4}$ squat position, DO NOT bend the knees (they will naturally bend by emphasizing sitting the hips back).
3. Shins should be perpendicular to the floor.
4. Back should be straight and flat (with a natural dip in the lower back), and head up.
5. The shoulders should be positioned slightly in front of the kneecaps (just like with a barbell).
6. The hands (dumbbells) should be on the side of the knees or shins.
7. This should put the athlete in a good jumping position to start the lift. **See Figures 1 and 2.**

Execution Phase: See Figure 3

1. Lift dumbbells explosively in a jumping motion by extending the hip, knee, and ankle joints.
2. At the end of the jump be sure to shrug the shoulders as well.
3. The dumbbells should stay close to the body and slide along the rib cage while keeping the face of the dumbbells parallel with the mirror. **See Figure 3.**
4. Elbows should be kept high above the wrists.
5. This should allow the dumbbells to reach maximum height.

Catch Phase: See Figure 7

1. As you start the downward motion into the catch position you should begin to flex and rotate the elbows under the dumbbells.
2. To catch the dumbbells, make sure elbows are fully extended and locked.
3. During descent you should also be splitting your legs to catch the dumbbells in a lunge or split catch position.
4. Do not allow the front knee to extend past the front of the toes while also trying to allow the knee of the back leg to bend only slightly.

5. Make sure you are in a full lunge position, elbows locked, good balance and under control before you stand back up. Do not allow the dumbbells to push your back leg into a lower bent knee position; try to stick the landing position in full control. **See Figure 7.**
6. To stand up, bring the front leg back until parallel with the back leg, and lower the dumbbell back down to the start position.
7. With every rep remember to alternate the forward leg.

Figure 7: Dumbbell Split Snatch - Catch Phase



Dumbbell Alternate Foot Alternate Snatch

With Dumbbell Alternate Foot Alternate Snatch, the only difference is to lift one arm at a time instead of lifting both arms at the same time. For proper execution you must lift the arm that is the opposite of the leg that is forward in the catch position. The uninvolved arm should remain at the side. This requires much more balance and coordination to perform than the basic dumbbell snatch. Remember to alternate each rep as to which leg is forward and which arm is raised in the catch. **See Figure 8.**



Figure 8: Dumbbell Alternate Foot Alternate Snatch

Dumbbell Jerk

Start Position: See Figures 9 & 10

1. Feet should be in a good jumping position (Narrow jumping width apart).
2. Dumbbells should be resting on the shoulders with elbows in the front and up facing the mirror. **See Figure 9.** You can also hold the dumbbells up by using the standing shoulder press position where elbows are down and the end of the dumbbell is sitting on the shoulders with hands facing forward. **See Figure 10.** This second position is more difficult to maintain with heavy weights.
3. Hips and knees should be slightly bent, ready to dip and jump.



Figure 9: Dumbbell Jerk - Start Position (dumbbells resting on the shoulders with elbows in the front and up facing the mirror)



Figure 10: Dumbbell Jerk - Start Position (standing shoulder press position where elbows are down and the end of the dumbbell is sitting on the shoulders with hands facing forward)

Execution Phase: See Figures 11 & 12

1. While keeping your chest up, you should begin to dip by sitting the hips back and allowing the knees to bend slightly a few inches, not quite into a $\frac{1}{4}$ squat position. **See Figure 11.**
2. Do not allow the athlete to dip by allowing the knees to bend forward. The motion should occur mainly in the hips into a squatting type motion. If the knees go out past the front of the toes, undue stress is placed on the patellar tendon, which is an unnatural jumping position. **See Figure 12.**
3. Once you have reached the bottom of the dip (just a few inches) you must immediately and explosively reverse direction by extending the hip, knee, and ankle joints simultaneously in a jumping motion.



Figure 11 (above): Dumbbell Jerk - Execution Phase (chest up, hips back and knees bent slightly)

Figure 12 (below): Dumbbell Jerk - Execution Phase (incorrect form)



4. Allow the arms to extend up into a locked out position while dropping under the bar into the catch position. (Remember: the triple extension motion, not the arms, is what raises the dumbbell. The arms are used only to catch the dumbbell and not to push it.)

Catch Phase: See Figure 13

1. After reaching full jumping height, you must immediately get into the catch position during descent.
2. To catch the dumbbells make sure elbows are fully extended and locked.
3. During descent you should also be splitting your legs to catch the dumbbell in a lunge or split catch position.
4. Do not allow the knee of the front leg to extend past the front of the toes while also trying to allow the knee of the back leg to bend only slightly.
5. Make sure you are in a full lunge position, elbows locked, good balance and under control before you stand back up. (Do not allow the dumbbells to push you into a lower bent knee position; try to stick the landing position in full control). **See Figure 13.**



Figure 13: Dumbbell Jerk - Catch Phase

6. To stand up bring the front leg backward until parallel with the back leg and lower the dumbbell back down to the start position.
7. With every rep remember to alternate the forward leg.

Dumbbell Alternate Foot Alternate Jerk

With Dumbbell Alternate Foot Alternate Jerk, the only difference is to raise one arm up at a time instead of driving both arms up at the same time. For proper execution you must lift the arm that is the opposite of the leg that is forward in the catch position. The uninvolved arm should remain at shoulder height. This requires much more balance and coordination to perform than the basic dumbbell jerk. Remember to alternate each rep as to which leg is forward and which arm is raised in the catch. **See Figure 14.**



Figure 14: Dumbbell Alternate Foot Alternate Jerk

Conclusion

In closing, I think the benefits of performing dumbbell Olympic exercises is a very effective training method for almost any athlete or sport. The ability to generate power with these exercises is tremendous. With the more advanced dumbbell exercises, you have the ability to improve an athlete's balance, coordination, and athleticism as well. I think that if you give these exercises a chance within your program design you will not be sorry.

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