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StrengthPro

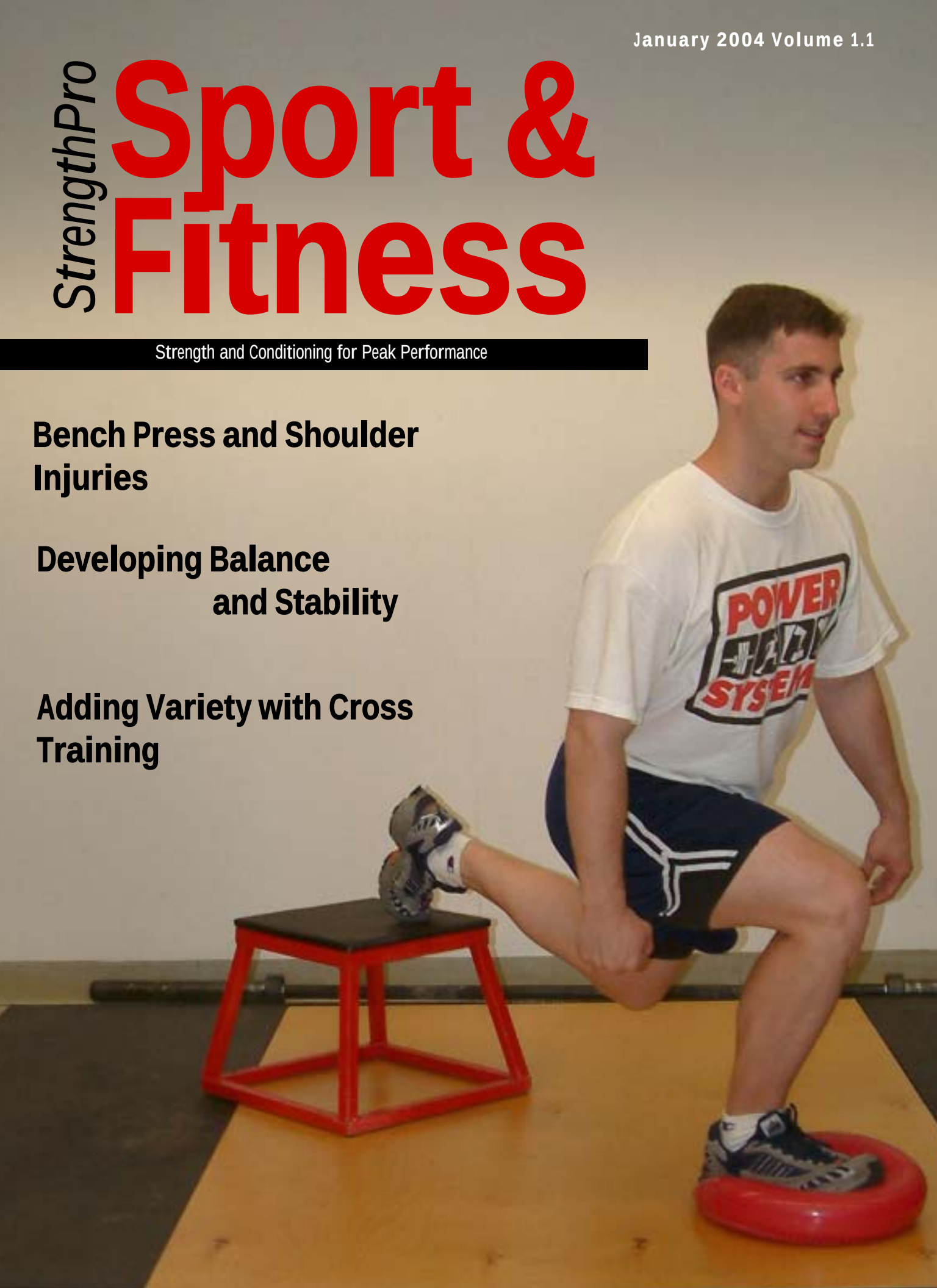
Sport & Fitness

Strength and Conditioning for Peak Performance

Bench Press and Shoulder Injuries

Developing Balance and Stability

Adding Variety with Cross Training



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Bench Press Blowouts:

Prevention and treatment

by Dr. Ken Kinakin

Big Bench, Big Pain?

"So, how much weight can you use for kickbacks?"

"A lot, dude. How much can you use for triceps pushdowns?"

"Man, I'm really weak right now, and I've got the big pushdown meet coming up next month!"

If you overheard the above conversation in your gym, you'd think, what planet are these guys from? Everyone knows that the bench press is one of the most highly-regarded exercises in the weightroom. In fact, most individuals measure their strength and, perhaps, their very manhood by how much weight they can bench. This emphasis on the bench cause many people to push the training envelope in an effort to increase their poundages, often resulting in injury. The most common mistake is benching too often, which doesn't allow the muscles and ligaments to heal properly. With this overtraining syndrome, many areas of the shoulder are affected, causing injury and decreasing overall performance.

The following article offers help to ensure injury-free training or, if injury has already been sustained, what steps can be taken to correct it.

An Ounce of Prevention

One of the best ways to prevent injury when benching is consistent employment of excellent tecnique. Proper technique can be summarized in one word: *contro*l.

When bench pressing, it's extremly important that the weight is controlled by the lifter for the duration of the repetition. If the bar is descended too quickly, it can hit the chest in the wrong spot, causing improper ascension toward the abdominals, resulting in compensation by raising the hips. This automatically forces the bar to go back over the chest, improving the chances of completing the lift.

The correct way to do the bench press is to lower the weight to the chest in a controlled motion. Note that the motion is described as controlled, not slow. The bar can still descend at a rapid pace, but at a controlled rapid pace. Too much energy may be expended if the descent time is overly long. (In hypertrophy training, a slower negative can be beneficial; however, we're focusing on maximal lifts here.) For beginners, a slower pace is preferable to one that's too fast. Once the ability to control the lift at a slow speed is mastered, speed can be increased. One of the best cues to learn how to maintain control is in grip strength. The harder the bar is squeezed, the more control is gained over the bar. Visualize making dents in the bar with your fingers, and the bar will become easier to control. For this reason, the false—or "thumbless"—grip (whereby the thumb is positioned on the same side as the fingers) isn't recommended. Research has shown that bench numbers can be increased by up to 10% simply by improving grip strength. In addition, the thumbless grip increases the potential for injury. The bar can slip or flip out of your hands and land on your chest, marring your training program and causing beautiful women to laugh at you—not good.
Secondly, there's no rational reason to use the thumbless grip. Some individuals contend that it makes the exercise more "strict," an incorrect assumption. The preferable alternative is to use a full grip and a stricter technique, which will allow an increase in the amount of weight lifted. The thumbless grip also increases the likelihood of a wrist injury, as the wrist is kept hyperextended (bent backward) to allow the bar to rest in the palms of the hands. With enough weight and time, this grip will cause an injury.

The second area of discussion involves the relationship between elbow angle and body position. The question is whether the arms should be held close to the body or at 90 degrees from the body. The answer depends on the motivation for doing the bench press in the first place. If the goal is to increase bench press poundage, keep the arms closer to the body, usually at a 45-degree angle: This technique allows a backward push at the very bottom of the bench press and utilizes the anterior deltoids, along with the chest. If muscular development of the chest is the objective, then benching with the arms out at 90 degrees from the body will put more stress on the pectorals and, therefore, increase chest development: Furthermore, varying the angle throughout your training cycle will achieve different effects.

Tell Me Where It Hurts

Pain felt during the bench can be caused by many different variables. To properly identify the factors involved, distinguish at which point in the range of motion the pain is felt. Feeling pain at the top of the bench is different than feeling it at the bottom. This holds true even when the pain is felt in one isolated area. The bench press can affect the muscles, joints, nerves, ligaments, and bursa of the shoulders. The majority of bench press injuries are one-sided and normally occur on the side of the dominant hand. It may seem strange that an exercise utilizing both arms and shoulders equally would cause pain on only one side, and usually the stronger side. This pattern indicates that the bench press isn't the true cause of the problem, but merely exposing a preexisting problem. If the bench press was the true cause

of shoulder pain, it would be felt in both shoulders equally and simultaneously. Clinically, however, that pattern is rarely seen, leading to the conclusion that the majority of bench press pain is due to preexisting shoulder conditions, rather than the bench press itself.

Compare this pattern of exposure with the alignment of an automobile. When vehicle alignment is off, it goes unnoticed until a certain speed (stress factor) is reached, at which poin the steering wheel begins to shake, exposing the alignment problem. At a speed of ten miles an hour, it's very rare that the steering wheel will shake, as there isn't enough stress being placed on the alignment. Similarly, for weight trainers, symptoms won't be present in an individual who's capable of benching 300 pounds but is lifting only 50 pounds. Preexisting problems are only revealed when enough stress is present to induce symptoms.

All shoulder muscles must be checked with orthopedic muscle testing to determine if the pain is being caused by the muscles, joints, or nerves.

Pain Patterns—The Evolution of Ouch

Pain usually begins slowly, with the trainer finding it manageable—until one day, enough pain is felt to inhibit benching altogether. The decision is made to stop training for a few days to allow the pain to subside. Occasionally, this plan works, until heavier weight is added to the bench, which causes the pain to flare up and interfere with the workout. The next typical step is to stop training for a few more day and add a painkiller or muscle relaxant to the regimen. This allows the pain to be reduced or halted. However, strength loss and dysfunction are still present. Consultation with other trainers in the gym will usually yield
the diagnosis "rotator cuff syndrome." This is a term used in sports medicine to describe a pattern in which the muscles that support the shoulder are painful. These muscles—the supraspinatus, infraspinatus, subscapularis, and teres minor—are responsible, individually or combined, for producing rotator cuff syndrome.

If the trainer's pain pattern is due to a mild muscle strain alone, the condition will be corrected in a few weeks through rest. When rest doesn't correct the problem, other causes and treatments need to be considered.

Proper Diagnosis of Shoulder Pain and Injury

The first step in correction of pain and injury is a complete and thorough examination by a sports medicine physician, chiropractor, or physiotherapist. The examination should include an assessment of the shoulder, arm, pecs, and cervical and thoracic spine to determine if one or more of these areas is involved. All shoulder muscles must be checked with orthopedic muscle testing to determine if the pain is being caused by the muscles, joints, or nerves. If the muscles are found to be weak in the shoulder joint, the pattern usually involves just the muscles and joint. If the muscles are weak all the way down the arm and into the wrist, the whole arm, upper back, and cervical spine may be influencing the weakness pattern. If this is the case, then all three must be treated simultaneously. The muscles, joint, and nerves must be treated first in order to restore strength prior to rehabilitation.

Too often, rehabilitation exercises are recommended for shoulder injuries which involve a dysfunctional shoulder joint due to muscles with excessive scar tissue and compromised muscular nerve supply. Once these problems have been corrected, rehabilitation is extremely effective. If the dysfunctional areas aren't treated, rehabilitation can have minimal to moderate results.

A dysfunctional muscle with excessive scar tissue due to years of heavy benching can't be strengthened properly. The same holds true for an unstable AC joint, or for compromised nerve supply to the pec due to a nerve entrapment in the neurovascular bundle under the collarbone. The process of identifying and correcting areas of dysfunction, followed by rehabilitation, will result in complete restoration of function and strength.

Rehabilitation alone will result in the pain returning when the trainer begins heavy benching again.

Treatments That Work

After treating hundreds of lifters, from novice level to world-record holders, I've found certain techniques to be very useful in the reduction of pain and improvement in healing, allowing lifters to successfully return to competitive lifting following injury. The typical pain and injury pattern involves an excessively scarred anterior deltoid, causing improper function, especially when stressed with a lot of weight.

The other muscle that's usually dysfunctional due to scar tissue is the subscapularis, located on the front of the scapula in the armpit. This muscle stabilizes the shoulder joint when pushing heavy iron.

The infraspinatus muscle in the back is an external rotator of the arm and usually becomes weak, creating more internal rotation than necessary. This pattern sets up altered biomechanics, leading to abnormal movement patterns which impinge on tissue, creating wear and tear in the shoulder joint. For strengthening the infraspinatus muscle, treatment incorporating rehabilitation tubing or dumbbell exercises are best. This exercise for the infraspinatus is an external rotation of the arm in an abducted position. In English, the person does a double biceps pose and brings his forearm down while leaving his upper arm in the same place until the palm faces the floor and the forearm is horizontal. This is like doing a double biceps pose toward the floor. Then you rotate the arm back into a double biceps position again. The best way to do this with resistance is to use a piece of rubber tubing or a cable machine that has an adjustable pulley height. Set the height of the pulley or tubing at shoulder level. Grab the handle in the position of a double biceps toward the floor, then rotate the arm until it's in a double biceps position. This works the external rotation, or infraspinatus:

In the shoulder joint, the AC

joint absorbs a lot of force when benching, and it's easy to traumatize and create an instability in this area. Muscles that cross an unstable joint won't work properly and might cause pain. The instability may be caused by a weakness in the subclavius, the small muscle located directly under the collarbone.

The most effective treatment for muscular injury used in my practice is Active Release Techniques (ART), developed by Dr. Mike Leahy. This is a soft-tissue therapy which breaks down scar tissue in muscle, allowing the muscle to heal and function properly. Treatment incorporating ART and rehabilitation exercises can usually help stabilize the collarbone. If the AC joint is overstressed, certain taping techniques can allow it to heal and rehabilitate by strengthening the muscles that cross the joint. It's imperative that the nerve supply to the muscles is unimpeded with no deficit in neurological impulses. The area that's commonly affected by poor nerve supply is in the upper back, or the upper thoracic region. The upper thoracic region is greatly affected by benching, as all of your bodyweight plus the weight of the bar is placed on the upper back. This can lead to excessive pressure in the spinal column and cause what's known as a T4 syndrome. This syndrome is recognized by a misalignment of the fourth thoracic vertebrae (T4), which can cause the whole arm to decrease in strength. T4 syndrome is often overlooked. However, once that area is fixed, strength can be restored and pain decreased dramatically. A chiropractic adjustment to the upper thoracic spine helps restore normal motion to the region and allows proper nerve-function. Nerve entrapment may also be found in the armpit region, where the nerve travels with the blood supply. A nerve entrapment decreases the nerve's ability to move and slide properly, causing the nerve to decrease in strength, and is often characterized by a tingling sensation in the hand. Treatment with ART, once again, is one of the best ways to remove adhesions and entrapment. Once the muscles, joints, and nerves function properly, follow with rehabilitation exercises for the shoulder and a slow introduction of benching with light weight. As the weight increases, seek treatment immediately to fix the area and assist the rehabilitation process if pain appears in any location. The entire process can take from a few weeks to a few months, depending on when the injury occurred and the amount of scar tissue that accumulates.

About the Author

Dr. Kinakin is the founder of the Society of Weight-Training Injury Specialists (SWIS) and the author of Optimal Muscle Training. He can be found on the web at www.swis.ca.

Fun Facts

The effects of tobacco kill more Americans than alcohol, drugs, murder, and AIDS combined

It takes more than 20 strips of bacon to equal the amount of fat in one serving of Fettucini Alfredo

Most healthy adults can go without eating anything for a month or longer. But they must drink at least two quarts of water a day.

Your heart beats about 100,000 times a day

If heart disease, cancer, and diabetes were eliminated, the life expectancy for both men and women would leap to 99.2 years

Research Reviews:

the Science of Training

The stimulus that causes muscles to increase size or strength as a result of resistance training is still unclear. Various metabolic mechanisms have been suggested as well as muscle fiber splitting and satellite cell activation. One of the theories that has been popular for a long time is that exercise induced muscle damage stimulates growth as the muscles repair themselves. Twenty six health, active, young adults, 19 male and 7 female participated in a study to determine if a single bout of eccentric training that elicited muscle damage would have any effect on the adaptation to subsequent training. The subjects trained the elbow flexors three times per week using 4 sets of 10 reps at 75% of their 1RM. Each arm was trained independently. Prior to training the subjects underwent 1RM testing on each arm as well as isometric MVC testing at five joint angles. One arm for each subject was randomly chosen to undergo a single bout of maximal eccentric work. The eccentric session consisted of one maximal eccentric repetition every 10 seconds for 10 minutes, making a total of 60 maximal eccentric contractions.

Two days following the eccentric training session there was a 14.9% decrease in strength in the eccentric trained arm. This is common of muscles that have undergone severe muscle damage following exercise. Following the nine week training program both the control arm (C) and the eccentric arm (E) had increased 1RM strength by 41.6% and 42.4% respectively. Isometric strength was increased by 16.6% for the C group and 18.4% for the E group. While there was no difference in the post treatment strength testing between the groups the C group showed a significantly greater improvement in strength during the first 5 weeks of the program.

The results of this study show that a single bout of eccentric training does not improve the effectiveness of subsequent mixed concentric-eccentric training. What is interesting to note is that the eccentric trained arm had slower strength increases for the first five weeks but had to have greater strength increases in the last four weeks for the two arms to have equal strength increases. It would have been interesting to see if the eccentric arm would have continued to increase faster in a longer study.

The results of this study do have some implications for athletic performance. Since there was a slower increase in strength in the eccentric arm for five weeks following the eccentric session it may be advisable for athletes to avoid this type of training in their final preparation for competition.

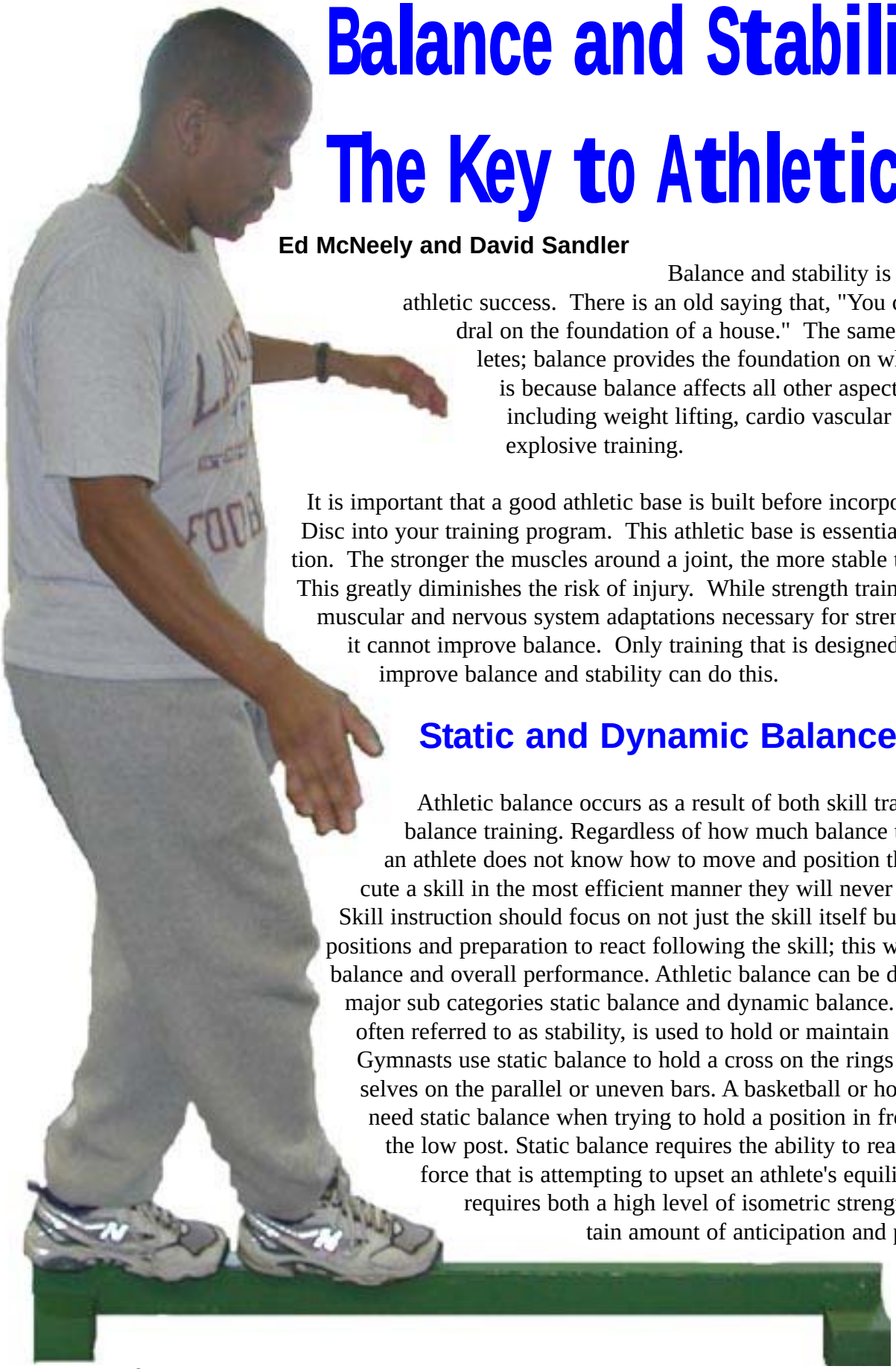
Folland, J., Chong, J., Copeman, E., and Jones, D. (2001). Acute muscle damage as a stimulus for training-induced gains in strength. Medicine & Science in Sport & Exercise. 33(7): 1200-1205.

Osteoporosis is a serious disorder that results in decreased bone density and increases the possibility of fractures. Increasing bone density during adolescence may help decrease the impact of osteoporosis should it occur later in life. Studies on weightlifters and track athletes suggest that plyometrics may be an effect means of increasing bone density. A recent study examined the effects of 9 months of plyometric training on the bone density of 56 high school aged girls with an average age of 14.6 years. The girls progressed from simple jumps in place to depth jumps following standard plyometric guidelines. They trained 3 times per week performing 100-140 jumps per session during the first 2 months and progressing to 360-1000 jumps per session in the final two months. This training regime resulted in significant increases in bone density compared to pretraining. Density at the greater trochanter increased by 3.1% while density at the femoral neck increased by 4.5%. In addition, strength improved by 14% and balance by 38%. This data suggests that plyometrics can be an effective way of increasing bone density in high school girls. It could be speculated that jumping sports such as basketball and volleyball may also be a means of increasing bone density. More research is needed to confirm this.

Witzke, K., and Snow, C. (2000) Effects of plyometric jump training on bone mass of adolescent girls. Med. Sci. Sports. Exerc. 32(6) 1051-1057.

Balance and Stability: The Key to Athleticism

Ed McNeely and David Sandler



Balance and stability is the foundation of athletic success. There is an old saying that, "You can't build a cathedral on the foundation of a house." The same is true for athletes; balance provides the foundation on which to build. This is because balance affects all other aspects of training, including weight lifting, cardio vascular conditioning, and explosive training.

It is important that a good athletic base is built before incorporating the Balance Disc into your training program. This athletic base is essential for injury prevention. The stronger the muscles around a joint, the more stable that joint will be. This greatly diminishes the risk of injury. While strength training can create the muscular and nervous system adaptations necessary for strength development, it cannot improve balance. Only training that is designed to specifically improve balance and stability can do this.

Static and Dynamic Balance

Athletic balance occurs as a result of both skill training and specific balance training. Regardless of how much balance training is done, if an athlete does not know how to move and position their body to execute a skill in the most efficient manner they will never have good balance. Skill instruction should focus on not just the skill itself but follow through positions and preparation to react following the skill; this will greatly enhance balance and overall performance. Athletic balance can be divided into two major sub categories static balance and dynamic balance. Static balance, often referred to as stability, is used to hold or maintain a body position. Gymnasts use static balance to hold a cross on the rings or support themselves on the parallel or uneven bars. A basketball or hockey player would need static balance when trying to hold a position in front of the net or in the low post. Static balance requires the ability to react to an external force that is attempting to upset an athlete's equilibrium. This requires both a high level of isometric strength as well as a certain amount of anticipation and preparation that

comes with playing experience.

Dynamic balance is the ability to maintain body positions during motion and is often referred to as body control. Jumping, landing, cutting, cornering, accelerating and decelerating all require a certain amount of balance. Athletes who have the ability to start, stop and change direction very quickly, under control not only have excellent speed and power but also superior dynamic balance. Dynamic balance plays an important role in injury prevention. Many knee injuries occur when the upper body continues in one direction while the lower body is going in the other direction, this results in a loss of balance and control and excessive shear or torque on the knee, resulting in an injury. Through better body control, dynamic balance helps the athlete to correct body positions that may result in injury.

Sensory Input and Balance

Balance is the combination of three systems working in conjunction. The first of these systems is the vestibular system. The vestibular system is a series of three fluid filled canals in the inner ear. The position and movement of the fluid in these canals tells the brain about the position of the head and how the head is moving. Very rapid head movements can overwhelm this system, causing dizziness and loss of balance. As children everyone has spun around in a circle until they fell down or became dizzy. The falling and dizziness are because the fluid in the inner ear is moving too fast for the brain to figure out what is going on.

The next system is the visual system, which promotes balance by allowing a horizon to be established. The brain then uses the horizon to help determine which way the body is moving. Try standing on one foot, it shouldn't be too difficult. Now try standing on one foot with eyes closed, it becomes much more difficult because the brain can no longer rely on the eyes to tell it how the body is aligned. Once an athlete has mastered balance training with their eyes open closing the eyes will bring a new level of difficulty to the exercises and drills.

The last system is the muscular system, which consists of the muscles and joint sensors. When the body changes position the joint sensors send a signal to the brain through the spinal cord telling it of the move. If the move puts the body off balance the brain will make the muscles

contract to correct the position and reestablish balance; because of this, core strength, strength in the abs, lower back and hips, is crucial to balance. The core muscles responsible for balance aren't the big ones that are trained in most strength training routines; rather the deeper small muscles are most responsible for balance.

The vestibular and visual systems are not easily trainable. There are some sport optometrists who work to train the visual system, but it is usually training the ability to follow something traveling through the air not training balance. The visual and vestibular systems degenerate with age making balance more difficult. To compensate for this the muscular system needs to be trained to take up the slack.

Designing a Balance Program

There are a number of balance tools available Balance Discs, Stability Balls, Teeter and Wobble Boards and Balance Pods; that can be used in a specific balance workouts on their own or incorporated as part of the warm up for strength, speed or power workouts.

Balance Workouts

Specific balance workouts will normally involve bodyweight only exercises. Specific balance workouts are excellent for athletes who do not have long periods of time to dedicate to a single workout, they can be done late in the day after other training in the comfort of home, 2-3 times per week. Exercises follow a bottom up progression, starting with exercises that work the ankle and progress to the upper body, combining exercises for both static and dynamic balance.

Reps and Work Time

It is difficult to count repetitions for some balance exercises; static position holds like the single leg balance for example are normally done for a prescribed time period rather than a number of repetitions. With the exception of endurance sports most sports involve a series of stops and starts of short duration using the anaerobic alactic energy system, the energy system that is available for immediate use but only lasts for 10-15 seconds. Balance activities, to more closely simulate sport demands should be done for work periods that also fall within this time frame of 10-15 seconds. Total work in a training session should not exceed 2 minutes for static hold drills.

Drills such as body weight squats and push-ups can use a rep scheme. Balance drills are normally not taken to a failure point; it is unsafe to experience the breakdown in technique that occurs just before failure when using the unstable base of sup-

port that balance tools provide.

Once you are capable of doing 15 repetitions with good technique it is time to move on to a harder drill, in a more unstable position or add resistance. Doing more repetitions than this will not increase the training effect and will only take time away from other components of training that may be of greater benefit to your overall performance.

Designing and Choosing Exercises

Almost every exercise will improve balance and stability to some degree and the number and variety of exercises is only limited by your imagination. To maximize performance there are several principals and progressions that can be followed:

Progress from stable to unstable: start with ground based drills and move onto more unstable apparatus. Progress drills from double support, both arms or legs, to single support, balancing on one arm or leg.

Start with static balance: static balance drills like one leg stands develop strength in the ankles, hips and trunk that allow dynamic drills to be preformed more effectively and with less chance of injury. Easy pushes and shoulder taps can be incorporated to upset the athletes balance once they have mastered simple floor drills, increasing the difficulty of the drill.

Add Movement: Once basic static exercises can be performed with easy movement should be added to the program. Start with simple movements like squatting and lunging using balance tools like the Balance Disc, Wobble Board or Bosu Ball and progress to more explosive moves like hops and jumps.

If you add balance training into your clients program there should be a purpose to it and it should complement other training. In recent years many trainers have gotten carried away with balance training, attempting harder and harder exercises with their clients to the point that many workouts look more like circus routines than training sessions. While balance training is an important part of an athlete's development spending too much time on balance activities that do not relate to the client's performance may hinder their athletic development by taking away from other more important types of training.

Using Balance Exercises in a Warm Up

The second way to incorporate the balance training into a program is as part of a warm up. Prior to a medicine ball or free weight workout the balance drill are an excellent tool for use in the specific phase of the warm up. Traditionally when doing strength-training exercises 1-3 progressively heavier warm up sets are done prior to reaching the work weight. Using balance tools during these warm up sets not only allows you to do balance training as part of an existing workout but the balance exercise may actually enhance performance in the heavier weight sets. Balance work requires significant nervous system activation and stimulation; this higher level of nervous system arousal may carry over to the heavier sets allowing you to handle a slightly heavier weight than you normally could.

If you do use balance training as part of a warm up keep the number of reps per set to less than five, otherwise the accumulation of fatigue will eliminate any carry over benefit to heavier training.

Purposeful balance training, using proper exercise progressions, 2-3 times per week will greatly enhance an athlete's skill, strength speed and power, improving their performance and decrease the risk for injury.

Exercise of the Month: Twisting Sit Up Toss

Lie on your back with knees bent and feet flat on the floor. Come to the top sit up position and raise your hands overhead. Have a partner toss a medicine ball to one side of your body at the level of your outstretched hands so that you have to rotate your trunk to catch the ball. Allow the weight to take you back to the bottom of the sit up without straightening your trunk. As soon as your shoulder blades touch the ground sit up, maintaining the twist in your trunk and throw the ball back to you partner. The power for the throw should be generated predominantly from the abdominal muscles with the arms only coming into play for the final toss. The partner standing must make good, consistent throws into your hands so that a rhythm can be established. Don't raise your hips off the ground during the sit up rather curl yourself up through the whole range of motion. If this drill is performed without the feet held down the abdominal muscles will do most of the work. If the feet are held hip flexors will do most of the work.

Nutrition Notes: Iron

Iron is an essential part of the oxygen delivery system as part of both haemoglobin and myoglobin (oxygen carriers in the blood and muscle). Low iron levels in athletes are a contributing factor in a disorder called ”sports anaemia” (Newhouse and Clement, 1988; Eichner, 1988). Sports anaemia is seen to occur primarily in female endurance athletes although, male endurance athletes are also at risk. Low iron levels, as measured by serum ferritin, may occur through a combination of factors. Growth, menstrual blood loss, sweat, and destruction of red blood cells through training increase the athletes requirement for iron. Haymes and Lamanca (1988) have suggested that the RDA for iron be increased for athletes in heavy training (Table 1). While male athletes seem to be able to meet the increased iron needs through diet many female athlete have difficulty obtaining the existing RDA let alone any increased RDA (Burke and Read, 1993).

The treatment of an iron deficiency is the use of a high dose (100-200 mg) oral supplement for one to three months (Burke and Read, 1993). While supplementation with iron improves iron status in the body the results of iron supplementation on performance are mixed with many studies showing no performance increases following supplementation (Burke and Read, 1993; Williams, 1998; Hultman, Harris, and Spriet, 1999).

Prevention of iron deficiency in at risk athletes is often a more economically viable alternative to regular testing and treatment of a deficiency when it occurs. Haymes and Lamanca (1984) have suggested the use of a low dose supplement of 18mg of elemental iron daily.

Adverse Effects

Supplementation with doses up to the RDA/RNI appears to be safe. Larger doses may cause, gastrointestinal discomfort, toxicity, constipation and in some cases hemochromatosis, the excessive storage of iron in the

Table 1. Iron requirements for Various Populations

Population	RDA (mg)	
	Non Athletes	Athletes
Adult Males	10	17.5
Teenage Males	12	17.5
Females	15	23

liver leading to cirrhosis and possible death (Williams, 1998). In addition, iron supplementation can interfere with the absorption of zinc and copper leading to deficiencies in these nutrients (Burke and Read, 1993).

Legal Issues

Iron supplements are not banned substances for athletic competition.

Recommendations

Supplementing with iron does not improve performance unless the athlete is deficient. While some recommendations have been made regarding the use of up to 18 mg of iron per day, the preferred method of increasing iron intake is through increased dietary intake (Hultman, Harris, and Spriet, 1999). Dietary iron can be increased by eating more lean red meat or dark meat of chicken, cooking in cast-iron cookware, eating dried beans or peas with poultry or seafood to improve the absorption of iron from the vegetables, or consume a beverage high in vitamin C when eating bread or cereal. Tea and coffee intake should be avoided when eating foods high in iron. Tea decreases iron absorption by about 60% and coffee decreases it by about 40% (Fairbanks, 1999). If a supplement is taken it should be done under the guidance of a physician.

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Fitness Facts

Adults over age 50 need to consume 1200mg of calcium per day.
Food and Nutrition Board

About 33% of the calories in 2% milk are from fat

During submaximal exercise women burn more fat and less carbohydrate than men
Canadian Journal of Applied Physiology

Adding Variety with Cross Training

Ed McNeely

Cross training gained popularity in the early 1980's primarily because of the sport of triathlon. Now athletes in most sports practice some form of cross training. While strength training, by some definitions, can be considered cross training, for the purpose of this article I will limit the discussion to aerobic training done on something other than your primary form of exercise.

Criticism of Cross Training

One of the most important principals of training is call the Specificity of Training Principal. This principal states that performance improvements are specific to the type, speed, duration, and range of motion of an activity. This explains why being a world class runner doesn't make you a world class swimmer. I guess the simplest way of putting it is "you get what you train for".

Cross training, by it's very nature, breaks the principal of specificity. When cross training you are using very different muscles and methods of training than you would normally . There are some coaches and scientists who will say non-specific training will not enhance sport specific performance and may even detract from it.

While I am a big advocate of the idea that you get what you train for many people take this idea too far. Cross training can be an important part of a training program if you know what you will get from it and how to use it.

Benefits of Cross Training

There are many benefits that cross training affords which far out weigh the fact that it isn't sport specific

Breaks up the Monotony

This is the most obvious benefit for anyone who has had to endure a long winter of indoor training. Getting outside for a change of scenery or even training in another location can psychologically make the training session seem much easier. I've heard many athletes complain that they have trouble doing a long continuous indoor session even though they are capable of outdoors for a longer period of time at a higher intensity. This is the boredom factor. When you are bored or not enjoying the session even the slightest discomfort can be magnified making the training session feel much worse than it really is. This will often lead to skipped sessions and a decrease in overall training volume, which isn't good for your progress.

Prevention or Rehab of Injury

Repetitive movement patterns can cause muscles to shorten, flexibility to decrease, and strength imbalances to develop. This leads to improper movement technique and eventual injury. The repetitive nature of endurance sports, and inadequate flexibility programs, are the chief causes of back injury in many athletes. Increasing the volume of cross training can eliminate the repetitive stress of sport specific training, improve flexibility, and help reestablish muscle symmetry.

Injured athletes can use cross training as a means of maintaining fitness when they can't train in their primary sport. I have seen many elite athletes who have improved their aerobic base dramatically as a result of an injury. During the time when they can't train specifically they end up doing a high volume of other activities. Often the total number of hours they spend cross training ends up being more than they would have done in regular training. In addition, they are removed from the competitive environment and pay more attention to training at an appropriate intensity for base building.

3. Develops other Muscle Fibers

For every movement a particular set of muscle fibers and motor units are activated. When the movement is changed the muscle fibers used will also change i.e. the muscle fibers used for running are different than the ones used in cycling.

Slow twitch muscle fibers can use the lactate produced by other muscles as an energy source. When cross training at the appropriate intensity the slow twitch fibers that are not involved in your sport become trained and more efficient at using lactate for energy. This means that you will be able to use up more of the lactate produced during racing and delay the onset of fatigue.

Incorporating Cross Training

Cross training can and should be incorporated into a training program all year round. The amount of cross training you do will depend on your total training volume and the time of year.

How Much Cross Training?

During the long cold winter months a club level athlete can have as much as 50% of their total training volume come from cross training. During the summer months that volume should be reduced to no more than 10%. If you are training six hours per week, during the winter you could do as much as three hours of cross training per week. During the summer months you would only want to do 35-40 minutes per week. These numbers obviously increase as your training volume increases. Some cross training should be done all year round otherwise you will lose the effects of the cross training done over the winter.

How Hard Should I Train?

Since you are trying to use the slow twitch fibers and improve their ability to use lactate, cross training should be low intensity. You should be able to carry on a normal conversation with a training partner when cross training. At lower intensity the improvement in slow twitch fibers will have a positive impact on your performance. Cross training at higher intensity has very little or no impact on sport specific performance and may even be detrimental.

What Should I Do?

The best type of cross training is the activity that you enjoy the most. Since many of the benefits of cross training come from the psychological break from a routine enjoyment should be the first consideration. Apart from enjoyment here are a few things to keep in mind.

Swimming is a great upper body cross training workout. Daily walking helps maintain lower body fitness. The addition of swimming once a week to a winter program will help train the upper body muscles aerobically

Running is a great form of cross training. It is inexpensive, doesn't require much equipment, and can be done almost anywhere. Heavy athletes may find running hard on the knees, hips, or ankles. Improper running technique or the wrong type of shoes can quickly lead to injuries.

Cycling is easy on the joints and can also be used as transportation to and from the boathouse. Other than the cost of a bike and traffic problems, there is very little drawback to cycling as a form of cross training.

Cross-country skiing is a popular alternative for those in snowy regions. It provides a nice mix of upper and lower body training while being joint friendly. Classical skiing is a better option for than skating. Skating can cause strength imbalances in the hips and shoulders, which may compromise technique or lead to chronic injuries.

While the fitness improvements that you get from cross training are not the same as from sport, keeping some low intensity cross training in your program all year long may give you that extra little edge everyone is looking for.

StrengthPro

Speed and Power Certification

The quickness to break through the line and accelerate past tacklers, grabbing a rebound out of the hands of your opponent, ripping off a 130 mph tennis serve or driving a golf ball 300 yards all have one thing in common. They all require incredible power.

Power, the optimal combination of speed and strength is essential for sport performance and is the difference between good and great athletesNot every sport has the same power requirement, being able to determine the ideal relationship between speed and strength for a sport, test an individual athlete for their strength and weaknesses and teach proper exercise progressions will allow you to develop more effective training programs and separate yourself from other trainers in the filed of athlete development.

With this in mind StrengthPro has created a certification that covers every aspect of power and speed development, from the science, to the exercises, to the development programs to maximize you clients results.

This four session lecture-workshop will provide each participant the skills and knowledge needed to develop explosive power programs. Examining both historical perspectives and the newest, scientific approaches for developing power the workshop will consist of approximately 50% of the time being devoted to lecture and 50% to practical application hands on applications, allowing participants to bridge the gap between science and practice.

Session 1: The Strength-Speed-Power Continuum

This lecture session will introduce participants to the physiological basis of power development and the Strength-Speed Power continuum. To develop optimal power one must first know whether that power is strength based or speed based. The continuum allows the participant to analyze the power demands of a sport or activity and determine the proportions of strength and speed needed to excel. Other topics covered include:

- Muscle and Nervous system physiology

- Force-velocity curve
- The length-tension curve
- Acceleration, Torque and Impulse
- Elastic energy, the stretch reflex and momentum
- Dynamic Power Expression
- The trade – off between strength and speed
- Where does optimal sport specific power lie?
- Sport and position specific power analysis

Session 2: Developing a Power Profile

During this practical workshop participants will be lead through a series of specific and general strength, speed, and power tests. They will learn to administer the test protocols, interpret the results and set training priorities and goals based on the testing and how the results match the strength-speed-power continuum analysis.

Session 3: The 5 Step Power Program

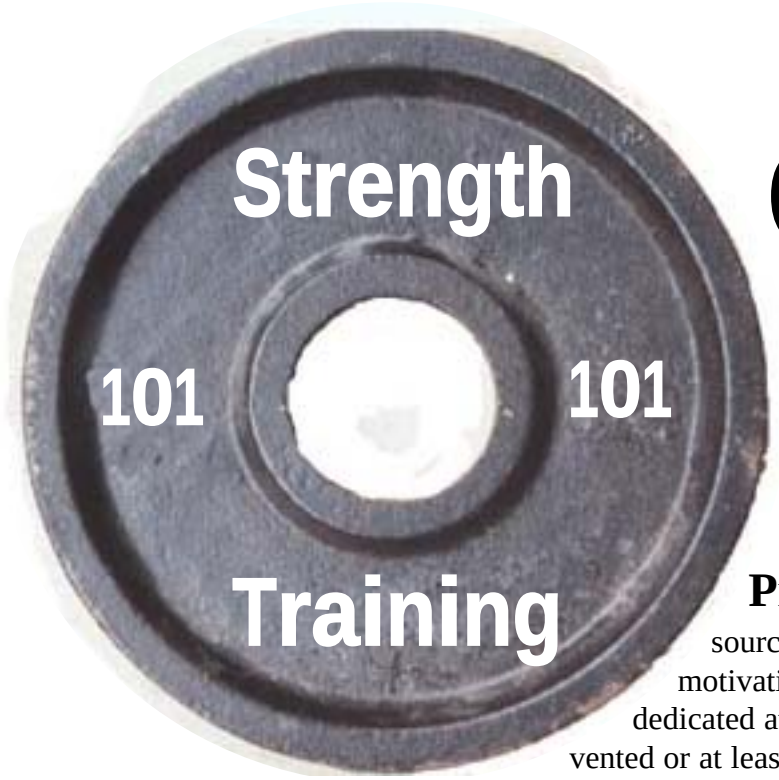
This lecture session provides the program variables and theoretical framework for designing specific power programs. The 5 step model provides participants with a simple, effective means of ensuring that they are covering ever aspect of power development. Topics covered include:

- Training muscles vs. training movements
- Replication and skill transfer
- The weight training paradox
- Power periodization cycling
- Antagonistic power combinations
- Volume-intensity relationships
- Overload
- Acceleration and deceleration

Session 4: Power Techniques

Building on the previous session, this hands on session features the drills, exercises and training methods discussed in the previous lecture. The group will be broken into smaller groups and cycle through four different stations where participants will learn and learn to teach ten different exercises and drills for a total of 40 new exercises ranging from releases and throws to plyometrics and Olympic lifts.

For information on a certification course in your area call 1-800-255-1017 www.strengthpro.com



Overcoming Plateaus

Plateaus. You've got to hate them. They are a source of frustration and aggravation, they decrease motivation and increase your risk of injury. While most dedicated athletes will experience plateaus, they can be prevented or at least shortened with careful planning and adherence to a few simple training principals.

Value of Variety

Frequently changing your program prevents your body from adapting and allows you to continue to make gains. One of the most common sources of variety is a change in exercise. If you've been doing squats for the past month and find that you aren't seeing anymore gains, it may be time to switch to front squats or leg press to stimulate new growth and strength. You don't even have to completely change exercises, sometimes a change in the range of motion is sufficient. Bench press lockouts, working just the top 4-6 inches of the bench press, are a great way to stimulate progress by changing the range of motion. After a couple of weeks of lockouts when you come back to bench press you'll once again see improvement.

Recovery is Key

While a change in exercise is the most common way to put variety in a training program it isn't the only way. Changes in training volume are a good way to break through plateaus. Occasional decreases in training volume can promote growth and increases in strength by allowing your body to fully recover and regenerate, helping to prevent burnout and overtraining. Think back to the last time that you missed a week of training due to work, family commitments, or illness. Remember how much stronger you were when you came back and how good your workouts were for the next few weeks. This was because the decrease in training volume has allowed you body not only to recover but improve. Adding a recovery week to your training every few weeks will give your body the rest it needs to maximize your progress. While there are many ways to schedule a recovery week, the simplest is to plan one down week ever month this gives your body the time it needs to replenish energy reserves, restore psychological balance, and overcome the fatigue that has accumulated during the preceding three weeks. A recovery week isn't a week off, rather it is a week where you cut the number of repetitions that you

do in half and decrease the intensity by 10-15%. If you normally do 3 x 10 in the bench, incline, and decline for your chest your volume in each session is 90 reps. During the recovery week you will cut this back to 45 reps and cut the weight you are lifting by 10%.

Focus Your Training

Plateaus in muscle mass often occur when different types of training are being done at the same time and the program is unfocused. It is very difficult to increase muscle mass and get leaner at the same time particularly if you are relying on aerobic exercise to burn fat. Aerobic exercise interferes with your ability to build muscle. Weight training tells your body that there is a need to increase size to make it easier to handle heavy loads with less stress on the body. Aerobic training tells your body that it needs to decrease muscle size to make working for long periods of time less demanding. It takes a lot more energy to move a 220 lb. body than it does to move a 160 lb. body. Aerobic training decreases muscle mass to conserve energy and make oxygen transport in the muscles more efficient. Does this mean you need to eliminate aerobic training from your program if you want to gain size? Of course not. Aerobic training is an important part of a balanced fitness program and helps you perform better in sporting events and speeds your recovery between sets.

Periodization is the process of focusing on one aspect of training while maintaining others so that different types of training complement each other rather than compete against each other. When you are trying to maximize muscle mass you will want to limit your aerobic conditioning to three 30 minute sessions per week. This is enough to keep you healthy without interfering with mass building. After 10-12 weeks of mass building you can increase the volume of aerobic training to 5-6 30-60 minute sessions to burn more calories and help you get leaner. Don't expect to see significant increases in size during this time keep in mind that your training is now focused on something else.

Breaking through a plateau can take time and patience. Experiment with these methods the next time you run into problems. Try them one at a time for 3-4 weeks before moving on to something else. Use a training log to keep track of how you are sleeping, what you are eating and what you are doing in training. It is only by keeping good records that you can figure out what works and what doesn't.