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Encyclopedia of Muscle & Strength

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Encyclopedia of Muscle & Strength

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PART I

Training Essentials

Strength training can be traced back to the beginning of recorded time. As early as 2000 B.C.E., the ancient Egyptians lifted sacks of sand to strength-train for hunting and military duty. According to military records, the Chinese also used strength training for their military personnel as early as 700 B.C.E. But the historical association that most people are familiar with is the ancient Greeks. Many of the athletes who competed in the ancient Olympics lifted heavy stones to develop strength and boost their athletic performance. Besides those functional results, strength training provided the development of a muscular physique. This masculine physique was honored in classic Greek art and writing. In fact, it may be the ancient Greek culture's celebration of muscle that is responsible for spawning the modern sport of bodybuilding. Several famous athletes during that period, such as Milo and Heracles, often performed feats of strength and displayed their muscularity to spectators who gathered to watch. In the 19th century, the appreciation by the masses for heavily muscled physiques made celebrities out of many performing strongmen of that time. The most famous was Eugen Sandow, who is considered the father of bodybuilding.

Despite the fact that humans have a longstanding fascination with strength and muscularity, the concept of strength training is one that few have familiarized themselves with. Even during the fitness boom of the 1970s in the United States, most Americans participated in some form of aerobic exercise but neglected the strength component of physical fitness. Over the years, with help from pioneers of strength training (such as Bob Hoffman, Joe Weider, and Charles Atlas) and through advances in research on the developing science of resistance training, strength became viewed as a necessary component of physical fitness and athletic performance. And participation in strength training grew faster than participation in any other physical activity.

As the popularity of strength training grew, so did awareness that this practice was a complicated science that participants must fully understand in order to reap the true benefits. That is why this part of the book is so important for anyone interested in strength training at any level. Unless you clearly understand the principles of strength training, you will never fully comprehend how to implement an effective strength training program.

So before you skip ahead to one of the strength training programs in parts II and III, be sure you have a decent grasp of the fundamentals presented in these first four chapters. Armed with this background, you will have a much fuller understanding of the exercises, techniques, and programs presented in the other chapters. You also will be more capable of individualizing these techniques to create specialized programs for yourself and for others.

CHAPTER 1

Core Concepts

Strength training is performed by a wide range of people for a variety of reasons. Most are interested in gaining muscle strength and muscle mass with a concomitant loss of body fat. In addition, many people expect these physical adaptations to carry over into improvements in performance of athletic endeavors and daily life activities. Strength training can provide these adaptations as long as you follow certain principles, which are discussed here to help you realize your strength training goals. These principles are integral to understanding how strength training works, how to individualize it to meet your needs and goals, and how to change it to continue making adaptations as you progress.

In addition to understanding the concepts of strength training, you must be familiar with the terminology that is often used in discussions of strength training. Having the ability to understand and use this lexicon will help you to learn the fundamentals of strength training and to communicate with others who participate in strength training. To familiarize yourself with this vocabulary, refer to the glossary on pages 381 to 386.

Before we can discuss the principles of strength training, we must define the major terms that will be discussed throughout this book. First and foremost is the actual term *strength training.* If you've done a fair share of reading on the topic of strength training—be it on the Internet, in magazines, or in other books—you've probably discovered that the terms *strength training, weight training,* and *resistance training* are often used interchangeably. While there are definite similarities in the three terms, a more precise interpretation of the definitions points out the differences. *Resistance training* is the broadest of the three terms. It describes any type of training in which the body must move in some direction against some type of force that resists that movement. This could include lifting free weights, pushing against a hydraulic apparatus, or running up a set of stairs. Strength training is a type of resistance training (although not all types of resistance training are strength training). Specifically, strength training refers to any type of training that involves the body moving in some direction against a force that specifically induces changes in muscle strength or hypertrophy (muscle growth). This could include lifting free weights or moving against a hydraulic apparatus, but not running up a set of stairs. Weight training is also a type of resistance training and can be a type of strength training. By strict terms of its definition, it refers to any type of training in which the body moves in some direction against a force that resists that movement and is supplied by some type of weight. This could include free weights and weight machines but not training with a hydraulic apparatus or running up a set of stairs. See table 1.1 for a list of training methods that are categorized under each of these types of training.

This book covers strength training (most of it will be weight training), because it best describes the types of training that we are interested in—exercise that involves the body moving against a force in an effort to induce changes in muscle strength or hypertrophy.

DEFINITIONS OF STRENGTH

The basic definition of strength is the maximal amount of force a muscle or muscle group can generate in a specified movement pattern at a specified velocity (speed) of movement (Knuttgen and Kraemer 1987). But defining strength is not that simple. That's because strength has many manifestations. The following definitions are all forms of strength.

Table 1.1 Categories and Methods of Training

Type of training	Sample training methods
Resistance training	Free weights (including common objects) Weight machines (linear guided, cable or pulley system, cam based) Hydraulic machines Pneumatic machines Isokinetic machines Body-weight training Sled dragging Parachute running
Strength training	Free weights (including common objects) Weight machines (linear guided, cable or pulley system, cam based) Hydraulic machines Pneumatic machines Body-weight training
Weight training	Free weights (including common objects) Weight machines (linear guided, cable or pulley system, cam based)

absolute strength—The maximal amount of force a muscle can produce when all inhibitory and protective mechanisms are removed. Because of this, it is rare that a person could ever demonstrate his or her absolute strength. This can take place only under extreme measures such as during an emergency, under hypnosis, or with certain ergogenic aids.

maximal strength—The maximal amount of force a muscle or muscle groups can produce in a specific exercise for one repetition. This is also referred to as *one-repetition maximum,* or *1RM.* Some estimate that the 1RM usually amounts to only about 80 percent of absolute strength. This type of strength is important for powerlifters.

relative strength—The ratio between a person's maximal strength and his or her body weight. This is important when comparing the strength of athletes who are much different in body size. Relative strength is determined by dividing the 1RM by the body weight of the person. For example, a 200-pound (91-kilogram) athlete who can bench-press 400 pounds (400 ÷ 200 = 2) has the same relative strength as a 100-pound (45-kilogram) athlete who can bench-press 200 pounds (200 ÷ 100 = 2). This type of strength is important for powerlifters as well as for football players and other strength athletes who are often compared with other teammates as a means of predicting performance on the field.

speed strength—The ability to move the body or an object quickly. This term is more commonly known as *power.* This type of strength is important for most sports but is most critical in track and field events such as the shot put, javelin, and long jump.

starting strength—The ability to generate a sharp rise in power during the initial phase of the movement. This type of strength is important in Olympic weightlifting, deadlifts, boxing, martial arts, and offensive line positions in football, where strength must be generated immediately.

acceleration strength—The ability to continue the sharp rise in power throughout most of the movement of the exercise. This type of strength takes over after starting strength and is important for sports such as judo, wrestling, and sprinting.

endurance strength—The ability to maintain force production for a longer time or through multiple repetitions of an exercise. This type of strength is important in wrestling, cycling, swimming, and training for bodybuilding.

Considering these numerous types of strength that a person can train for specifically, it's easy to understand that the term *strength training* encompasses many types of training approaches. Regardless of whether you are training for maximal

strength, power, or endurance strength, you are following some form of strength training. Each of these types of strength is developed with the use of resistance of some type, be it free weights, machines, or body weight. Although this book focuses on strength training for muscle mass and strength, other muscle adaptations can take place with the use of strength training.

TYPES OF MUSCLE ACTION

During a typical strength training session, muscles may contract from tens to hundreds of times to move the body or the implement they are training with. Neural stimulation of the muscle causes the contractile units of the muscle to attempt to shorten. But contraction does not always involve shortening of the muscle fibers. Depending on the load and the amount of force supplied by the muscle, three different muscle actions may occur during a muscle contraction:

1. *Concentric muscle action.* This type of muscle action occurs when the muscle force exceeds the external resistance, resulting in joint movement as the muscle shortens (see figure 1.1*a*). In other words, concentric contractions are those in which the muscle fibers shorten while contracting to lift the weight. This is demonstrated by the upward phase of a biceps curl and is often referred to as the *positive phase of the repetition.*

2. *Eccentric muscle action.* This type of muscle action occurs when the external resistance exceeds the force supplied by the muscle, resulting in joint movement as the muscle lengthens (see figure 1.1*b*). Eccentric muscle actions are demonstrated by the downward phase of the biceps curl. This is often referred to as the *negative portion of the repetition.* Even though the fibers are lengthening, they're also in a state of contraction, permitting the weight to return to the starting position in a controlled manner.

3. *Isometric muscle action.* This type of muscle action occurs when the muscle contracts without moving, generating force while its length remains static (see figure 1.1*c*). Isometric muscle actions are demonstrated in an attempt to lift an immovable object or an object that is too heavy to move. The muscle fibers contract in an attempt to move the weight, but the muscle does not shorten in overall length because the object is too heavy to move.

Among strength training scientists there is much debate about the importance of each of these types of muscle actions regarding increases in strength and muscle mass. Studies have been conducted in an effort to determine whether one type of muscle action is most important for enhancing muscle strength and mass. Because it is possible to produce greater force during eccentric and isometric muscle actions as compared to concentric muscle actions, it has been hypothesized that these muscle actions may be more important than concentric muscle actions for inducing changes in muscle strength and size.

Researchers have found that training with isometric muscle actions can increase muscle strength and size (Fleck and Schutt 1985). However, the

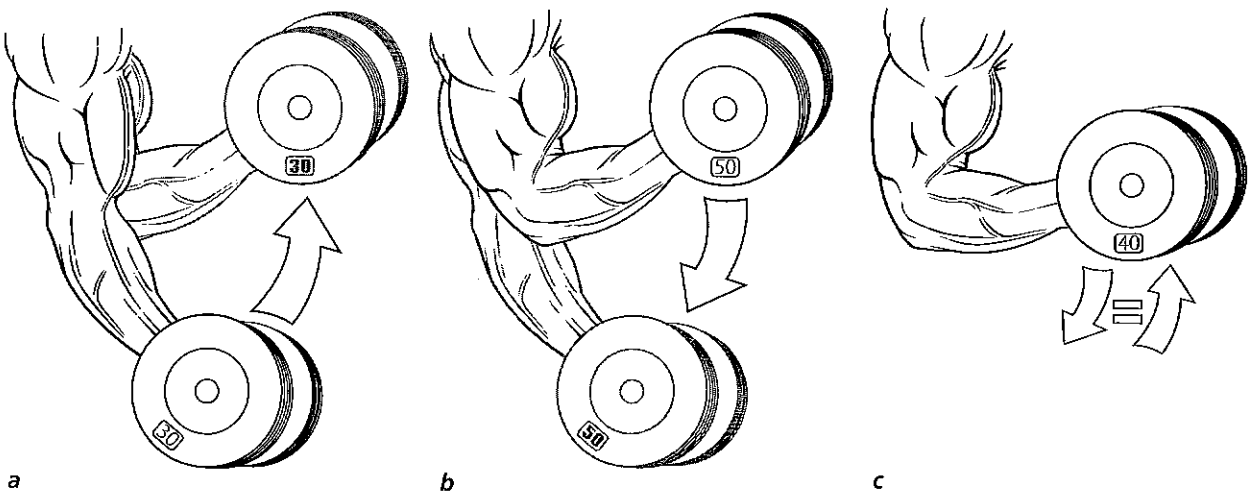


Figure 1.1 Major types of muscle actions: *(a)* concentric, *(b)* eccentric, and *(c)* isometric.

strength gains from isometric training are realized only during the specific joint angles at which the muscles were trained. In other words, if someone trains isometrically on the bench press at the point halfway between the start and finish, that person will gain muscle strength only at that specific point in the exercise. This would not equate to greater overall strength in the bench press unless a variety of joint angles between the start and finish were also trained isometrically. Therefore, while isometric training can be beneficial, concentric and eccentric muscle actions should also be included for better overall muscle adaptations. For a sample training program that uses isometric muscle actions, see Static Strength Training on page 170 in chapter 9.

Because it is possible to overload a muscle more during eccentric muscle contractions, these contractions cause more muscle damage. It has been hypothesized that this greater overload can induce greater gains in strength. Indeed, research has shown that eccentric-only training does induce significant strength gains; however, this training appears to offer no greater strength benefit than concentric-only training. Therefore, to maximize muscle adaptations, strength training programs need to incorporate both concentric and eccentric muscle actions. For sample training programs that incorporate eccentric training, see Negative Repetitions on page 89 in chapter 6 and Negative-Rep Strength Training on page 177 in chapter 9.

The use of concentric, eccentric, and isometric muscle actions in strength training will yield somewhat different adaptations. Although isometric muscle actions can improve strength and muscle size to some degree, they provide mainly static strength. This does not necessarily carry over to dynamic strength used for most sports. Therefore, most strength training programs should focus on concentric and eccentric muscle actions. Greater improvements in strength and muscle mass can be achieved when repetitions include both concentric and eccentric muscle actions.

Another type of muscle action that should be considered here is called *voluntary maximal muscle action*. This type of muscle action does not refer to the actual movement of the muscle but to the intensity of the resistance. When a muscle undergoes a voluntary maximal muscle action, it is moving against as much resistance as its current fatigue level will allow. Regardless of how many repetitions are performed in a set—whether it be 1 or 10—it is the last repetition, when momentary concentric muscle failure is reached, that is considered the voluntary maximal muscle action. In other words, not another single repetition can be performed. This is also referred to as the *repetition maximum (RM)* and is usually represented with a number preceding the RM. For example, 1RM would represent the amount of weight that induces a voluntary maximal muscle action with one repetition. A 10RM is the amount of weight that induces a voluntary maximal muscle action on the 10th repetition.

PRINCIPLES OF STRENGTH TRAINING

Countless principles of strength training are being employed today. But the validity of many of these principles is questionable, because few strength training professionals agree on the majority of them. However, there are a few principles that are revered by all strength training professionals: the principle of specificity, the principle of progressive overload, the principle of individuality, the principle of variation, the principle of maintenance, and the principle of reversibility. So important are these principles that few would argue against their being considered laws of strength training.

principle of specificity—One of the seminal principles in designing strength training programs. It is often referred to as SAID, which stands for "specific adaptation to imposed demands." In its most basic definition, it means to train in a specific manner to produce a specific outcome. For instance, if the immediate goal is to increase 1RM strength, then training with the appropriate range of repetition, proper rest periods, and apposite frequency to optimize strength gains is a necessity. Or if the goal is to increase athletic performance in a specific sport, the exercises should mimic the types of movements performed in the sport, and they should be performed at a similar speed as those movements. This principle is one of the most important in strength training because if it is not being met, all other principles are negated.

principle of progressive overload—The practice of continually increasing the intensity of the work-

out as the muscle becomes accustomed to that intensity level. This can be done by increasing the weight lifted, the number of repetitions performed, or the total number of sets; or it can be done by decreasing the rest between sets. Continually increasing the stress placed on the muscle allows the muscle to increase its strength and prevents stagnation. This is one of the most critical principles of strength training as well as one of the earliest developed. This principle was established just after World War II by the research of DeLorme and Watkins (1945, 1948). Without providing the muscles with progressive overload, continual adaptations in muscle strength and size would cease. For example, at the start of a strength training program, performing three sets of 10 reps on the bench press with 135 pounds may be a challenge. After several weeks of training, performing three sets of 10 reps on the bench press with 135 pounds will become easy. At this stage, training adaptations will cease unless the weight is increased above 135 pounds, the reps are increased above 10 reps, the sets are increased to more than three, or the rest between sets is decreased.

principle of individuality—The theory that any training program must consider the specific needs or goals and abilities of the person for whom it is designed. For example, a beginning bodybuilder with the goal of adding muscle mass would have a much different training program than an advanced bodybuilder with the same goal. The difference in their training programs is based not on their desired training outcomes but on their training experiences. The advanced trainer would require more volume and high-intensity training techniques to reach the same goal as the beginner. On the other hand, an advanced lifter who has the goal of gaining muscle mass would train much differently than an advanced lifter with the goal of gaining muscle strength. Here the difference in their training programs is based on their different goals. In general, the advanced lifter with the goal of gaining more muscle strength would train with fewer reps, heavier weight, and lower volume than the advanced lifter with the muscle mass goal.

principle of variation—The simple fact that no matter how effective a program is, it will be effective only for a short period. Once a person has experienced the specific adaptations that a particular training program is designed to provide, a new stimulus must be imposed on the muscles or continued progress will be stagnated. This is the foundation of periodization (discussed in chapter 3) and is the reason that training cycles must be employed.

principle of maintenance—As a person reaches his or her goals, it takes less work to maintain that level of strength or muscle mass. If he or she is happy with that level, the frequency of training can be reduced. This is typically a good time to involve more cross-training so that other fitness components can be developed.

principle of reversibility—The fact that once the strength training program is discontinued or not maintained at the minimal level of frequency and intensity, the strength or hypertrophy adaptations that were made with that program will not only stop forward progression but will also revert back to the starting level.

SUMMARY

To properly apply any discipline, you must first familiarize yourself with the principles of the discipline. Without a clear understanding of the foundation of strength training, the application of it will be lacking. Just as an athlete who doesn't understand the basics of his sport will do poorly in that sport, not understanding the basics of strength training will severely limit your potential. Regardless of whether your goal is to increase muscle mass or muscle strength, having this knowledge will have a positive effect on your ability to reach your goal.

First you must understand the different types of strength that you can train for: absolute, maximal, relative, speed, starting, acceleration, and endurance. Being familiar with the different muscle actions is essential to understanding the components of any repetition you perform. You will learn the concepts to follow in order for adaptations to take place. This basic information is just the starting point. This knowledge base will continue to grow with information contained in the following chapters of part I. Once you are armed with this seminal information, applying the training techniques and programs in the later sections will be easier and the results will be more substantial.

CHAPTER 2

Training Variables

The average strength training program will last several weeks to several months before a new training phase is implemented. Considering this time frame, a single workout may seem inconsequential to the overall program. Yet the design of each single workout is just as important as the overall program. This is because each workout adds up sequentially to create the long-term training program that will provide the adaptations that the program imparts. This chapter discusses the principles involved in designing a single strength training workout.

Every workout is composed of at least five specific program variables that you can manipulate in order to alter the workout: choice of exercises, order of exercises, number of sets, resistance, and rest taken between sets. You must carefully choose these variables to get a workout that is appropriate for your level of fitness and that initiates the desired adaptations.

Although strength athletes such as Olympic weightlifters, powerlifters, and bodybuilders have manipulated these variables for many years, William J. Kraemer, PhD, is credited with scientifically determining and recording what he has termed the five specific clusters of acute program variables (see table 2.1). The systematic alteration of these acute variables results in the periodized training program.

CHOICE OF EXERCISES

While all acute variables of a program are critical to a person's progress, choice of exercise is arguably one of the most critical. The reasoning behind this is that if you are not training the appropriate muscle groups, then all other variables are somewhat meaningless. Simply put, muscles that are not trained will not benefit from the program. Therefore, choosing the proper exercises for each workout is the first step in creating an effective strength program.

For those interested in gaining muscle strength, all exercises in a workout can be categorized as either a primary exercise or an assistance exercise. Refer to table 2.2 for a list of common primary and assistance exercises. Primary exercises are those that are most specific to the goals of the individual. These exercises must involve the muscle groups in which the person is most interested in gaining strength. For competitive athletes, the primary exercises not only should target the same muscle groups that are used in competition but should also include some exercises that mimic the movements performed in their sports. For example, the primary exercises for an Olympic weightlifter are the clean and jerk and the snatch; for a powerlifter they are the bench press, squat, and deadlift; for an offensive lineman they are the squat and incline bench press.

Primary exercises usually are multijoint movements such as the bench press, squat, and deadlift. These exercises require the coordinated use of multiple muscle groups. Because several large muscle groups are used in performing these exercises, they tend to be the ones in which the most weight can be lifted. For instance, the world records in the deadlift and the squat are well over 900 and 1,100 pounds (408 and 499 kilograms), respectively. The world record in the barbell biceps curl (although this is not a lift that is sanctioned by any powerlifting federation), a single-joint exercise (typically referred to as an assistance exercise), is not much more than 400 pounds (181 kilograms). Because the primary exercises call for great strength and coordination, they should be performed early in the workout when the muscle groups are the least fatigued.

Assistance exercises typically are single-joint exercises such as the biceps curl, triceps extension, and deltoid lateral raise. These exercises

Table 2.1 Program Design Details

Variable	Specifics
Choice of exercises	Primary exercises Assistance exercises Multijoint exercises Single-joint exercises Exercise equipment
Order of exercises	Primary exercises followed by assistance exercises Larger muscle groups followed by smaller muscle groups Lagging muscle groups trained first Straight sets for each exercise Supersets
Number of sets	Volume effects Single sets Multiple sets Number of sets performed per exercise Number of sets performed per muscle group Number of sets performed per workout
Resistance (intensity)	Percentage of 1RM RM target zone OMNI-resistance exercise scale
Rest period between sets	Dependent on resistance used Dependent on muscle adaptation desired Dependent on metabolic pathway being trained Dependent on training technique

Adapted, by permission, from S.J. Fleck and W.J. Kraemer, 2004, *Designing resistance training programs*, 3rd ed. (Champaign, IL: Human Kinetics), 158.

Table 2.2 Primary and Assistance Exercises

Primary exercises	Assistance exercises
Power clean	Knee extension
Deadlift	Leg curl
Squat	Chest fly
Leg press	Deltoid lateral raise
Bench press	Biceps curl
Military press	Triceps extension
Barbell row	Wrist curl
Pull-up	Calf raise
	Abdominal crunch

involve only a single muscle group. Because only one muscle group is working to lift the weight, these exercises usually involve much lighter weight than primary exercises do. For powerlifters and other strength athletes, assistance exercises are usually done toward the end of the workout after the major muscle groups are fairly fatigued from performing the primary exercises. An exception to the rule that all assistance exercises are single-joint exercises is core training. Training the core (the deep muscles in the abdominal cavity and lower back) involves complicated movement patterns that involve multiple joints and force the core musculature to work at stabilizing the body.

For those interested in building muscle size, all exercises also can be divided into multijoint and single-joint exercises. However, the terms used in bodybuilding circles are *multijoint* and *isolation exercises*. *Isolation* implies that the single-joint movement is isolating the major muscle group and forcing it to perform all the work in that exercise without the help from other muscle groups. An example of this is the leg extension. While most major muscle groups have both multijoint and isolation exercises that target them, the biceps, forearms, hamstrings, calves, and abdominals are muscle groups that are trained usually with just isolation exercises. For a list of multijoint and isolation exercises for most major muscle groups, refer to table 2.3.

Table 2.3 Multijoint and Isolation Exercises

Muscle group	Multijoint exercises	Isolation exercises
Chest	Bench press Dumbbell bench press	Dumbbell fly Cable crossover
Shoulders	Barbell overhead press Upright row	Lateral raise Front raise
Triceps	Close-grip bench press Dips	Triceps pressdown Lying triceps extension
Biceps		Barbell curl Seated incline curl
Forearms		Wrist curl Reverse wrist curl
Quadriceps	Squat Leg press	Leg extension
Hamstrings		Leg curl Romanian deadlift
Calves		Standing calf raise Seated calf raise
Abdominals		Crunch Reverse crunch

Exercise equipment is another factor to consider when choosing exercises for an individual workout. While free weights are used in the majority of the primary exercises, other equipment has its benefits depending on the overall goals of the person. For example, to mimic movements that occur in a more horizontal plane while an athlete is in an upright position (such as swinging a baseball bat), free weights are a poor choice because they offer resistance only in a vertical plane. Here, the use of a cable apparatus or resistance tubing would be a better exercise choice. Choosing appropriate strength training equipment is discussed in more detail in chapter 4.

ORDER OF EXERCISES

How the specific exercises that make up a single workout are ordered will determine not only the effectiveness of the workout but also the particular adaptations that the program imparts. Therefore, the order in which exercises are performed must correspond with the specific training goals.

In training for strength, the primary exercises are performed first in the workout relative to assistance exercises. The logic behind this is the fact that primary exercises typically involve numerous large muscle groups working together to lift relatively heavy weight. Therefore, these exercises must be done early enough in the program that fatigue is not an issue. Performing single-joint exercises first will compromise the amount of weight a person can lift on the primary exercises and may even make the person more susceptible to injury, because form tends to suffer when muscles are fatigued.

If building muscle size is the primary goal, then multijoint exercises should be performed first with isolation exercises performed later in the workout. The multijoint exercises help to build muscle size because it is possible to train with heavier weight on them. An exception to this rule involves a common bodybuilding technique known as preexhaust. This technique involves the use of single-joint exercises before multijoint exercises in an effort to exhaust a particular muscle group so that it becomes the weak link in the multijoint exercise. This concept is discussed in detail in chapter 6.

If multiple muscle groups are trained in a workout, such as in whole-body workouts, and only one exercise per major muscle group is performed, then ordering exercises involves determining the most critical muscle groups based on the goals of the

person. Typically, larger-sized muscle groups (such as the legs and back) are trained before smaller muscle groups (such as the shoulders and biceps) for the same reason mentioned previously: Larger muscle groups need to be trained before fatigue is an issue.

NUMBER OF SETS

A set is a grouping of repetitions that is followed by a rest interval. The number of sets performed in a workout is one of the factors affecting the total volume (sets × repetitions × resistance) of exercise. Therefore, it must be consistent not only with the individual's strength goals but also with his or her current level of fitness.

Generally speaking, it is accepted that multiple sets are more beneficial for developing strength and muscle mass. In fact, this stance is supported in guidelines set by the National Strength and Conditioning Association (Pearson, Faigenbaum, Conley, and Kraemer 2000) and the American College of Sports Medicine (Kraemer et al. 2002). Single sets are effective for building strength for beginning weightlifters or for maintaining strength during periods when it is necessary or desired to reduce the volume performed. Beginners starting with a single-set program should progressively increase the number of sets to make continued adaptations in strength.

When designing a workout, one should consider the number of sets performed per exercise, the number of sets per muscle group, and the total number of sets for the workout. The number of sets per exercise typically varies depending on the strength training program. Most programs designed for the intermediate to advanced weight trainer incorporate between three and six sets per exercise. This set range is considered optimal for increasing strength. How many sets one should perform per muscle group is a question that is most applicable to bodybuilding-type training, in which numerous exercises are performed for each muscle group. This is in opposition to strength training programs for conditioning athletes, which may typically involve only one exercise per major muscle group. The number of sets per muscle group may range from 3 to 24 but ultimately depends on the number of exercises performed for that muscle group, the number of muscle groups trained in that workout, the intensity used, and where the person is in his or her training cycle. The total number of sets performed for a workout may vary from about 10 to 40, depending on the type of training and the number of sets per exercise. Care must be taken so that not too many total sets are performed, particularly when intensity is high, since these variables greatly influence total work. Performing too much total work over time stresses the body and can lead to overtraining. Although defining how much work is too much is a difficult task because many factors are involved, such as the person's training experience and genetics, general recommendations can be made. Typically doing more than 20 sets per muscle group for an extended period can lead to overtraining. In addition, doing more than 40 sets per workout, even when multiple muscle groups are trained in that workout, can lead to overtraining if done too frequently.

As for any other acute variables of training, the number of sets should be manipulated to prevent stagnation of training adaptations. The most important variable of training that influences the number of sets that should be performed is intensity (the amount of weight lifted). The greater the intensity, the greater the stress placed on the muscle, and thus the lower the number of sets that should be performed. Therefore, the total number of sets in a training cycle should vary inversely with training intensity. In fact, training with too many total sets can be detrimental to the adaptations of strength training and lead to overtraining.

RESISTANCE

The term *intensity* refers to the amount of weight lifted (or resistance used) on a particular set. Alternatively, many bodybuilders use *intensity* to refer to the difficulty of a set or a workout, regardless of the amount of weight used. For example, a bodybuilder may perform a high-intensity set involving very light weight at extremely high repetitions until muscle failure is reached. The intensity of that set would be even higher if the spotter helped the bodybuilder get three extra forced reps at the end of that set. However, according to the formal definition of *intensity,* that set would be categorized as low intensity. Therefore, to avoid confusion, the term *resistance* will be used when referring to the amount of weight used.

The resistance used is one of the most important variables in a training program, ranking second only to exercise choice. The amount of resistance used for a set is inversely related to

the number of repetitions performed. That is, the heavier the weight, the fewer the repetitions that can be performed. One of the most common ways that resistance is measured is through the use of a percentage of the repetition maximum (RM). For example, an exercise can be prescribed at 80 percent of the individual's 1RM.

If, for instance, the person's 1RM on the bench press is 300 pounds (136 kilograms), then

300 pounds × .80 = 240 pounds

Using this method does require frequent 1RM testing to ensure that accurate training resistance is used. This method may be desirable for certain strength athletes because recurrent testing is a commonly used measure of an athlete's progress and a predictor of preparedness for competition. Olympic weightlifters should use this method regularly because of the skill component required for that type of lifting. Competitive weightlifters must use precisely measured resistance for their training phases. Powerlifters also commonly use this method because the defining moment in their sport is the amount of weight they can perform at 1RM on the bench press, squat, and deadlift. However, many top powerlifters train with percentages that are based on the 1RM they are predicting to lift in competition. The down side to prescribing exercise intensity with RM percentages is the fact that the amount of reps you can perform at a certain percentage of 1RM can vary depending on experience, the muscle group being trained, and the exercise equipment used.

For bodybuilders and other fitness enthusiasts, frequent testing of 1RM is not convenient or often feasible. It would be too time consuming because of the larger number of exercises they typically use. In addition, many of the exercises they perform are not conducive to 1RM testing. Although charts are devised for estimating 1RM based on the number of reps that can be completed at a certain weight, these are far from accurate. For serious weight trainers, an RM target zone is the easiest way to monitor training resistance. This is depicted as 10RM or 5RM and refers to a resistance that limits them to that number of repetitions. As their strength increases, they simply move to a heavier weight but shoot for the same RM goal. This allows them to continually stay in the repetition range they are shooting for without the need to test their 1RM. Worth mentioning here is that many strength coaches and strength training scientists suggest that repetitions (resistance) should be kept in a fairly small range for any given workout. They believe that muscle can be trained for only one goal in any acute situation. Yet bodybuilders often train with a wide range of repetitions in a single workout. For example, they may do one set of an exercise with a very heavy weight for 5 to 7 reps and follow it with another set with light weight for reps in the 15 to 20 range.

A more recently developed method of prescribing and monitoring resistance involves the use of the OMNI-resistance exercise scale (Robertson et al. 2003; Robertson 2004). This is a 10-point subjective scale (see figure 2.1) that is a modified version of the rating of perceived exertion (RPE) scale that was originally described by Borg (1982) and used mostly for monitoring aerobic exercise. Each value from 1 to 10 on the OMNI represents approximately a 10 percent increase in repetition maximum. For example, the use of 100 percent of a person's 1RM elicits a rating of 10 on the OMNI-resistance exercise scale, while the use of 50 percent of the person's 1RM corresponds to a rating of 5 on the scale. The OMNI-resistance exercise scale is not a precise quantitative scale but more a qualitative scale that determines how hard the weight feels to the lifter. For this reason, it is best used by trainers who are prescribing strength training to inexperienced lifters.

Today, thanks to the many years of trial and error by athletes and the numerous research studies to confirm the original inclinations, it is now well established that using certain resistance intensities provides corresponding results. This information can be used in designing a repetition maximum continuum as seen in figure 2.2. This figure is a modification of the continuum devised by Fleck and Kraemer (2004) that is recognized as the most acceptable by exercise scientists and strength coaches. The continuum in figure 2.2 ranges in maximal repetitions from 1 to 25, as does the original, but adds the adaptation of muscle hypertrophy. On the lower end of the continuum, strength gains are more pronounced, particularly when using maximal repetitions in the range of 1 to 6, or about 80 to 100 percent of 1RM (O'Shea 1966; Weiss, Coney, and Clark 1999). Enhanced muscle hypertrophy is most notable when training with repetition maximums in the 8 to 12 range, which corresponds to about 70 to 80 percent 1RM (Kraemer, Fleck, and Evans 1996). And muscular endurance benefits occur with repetition

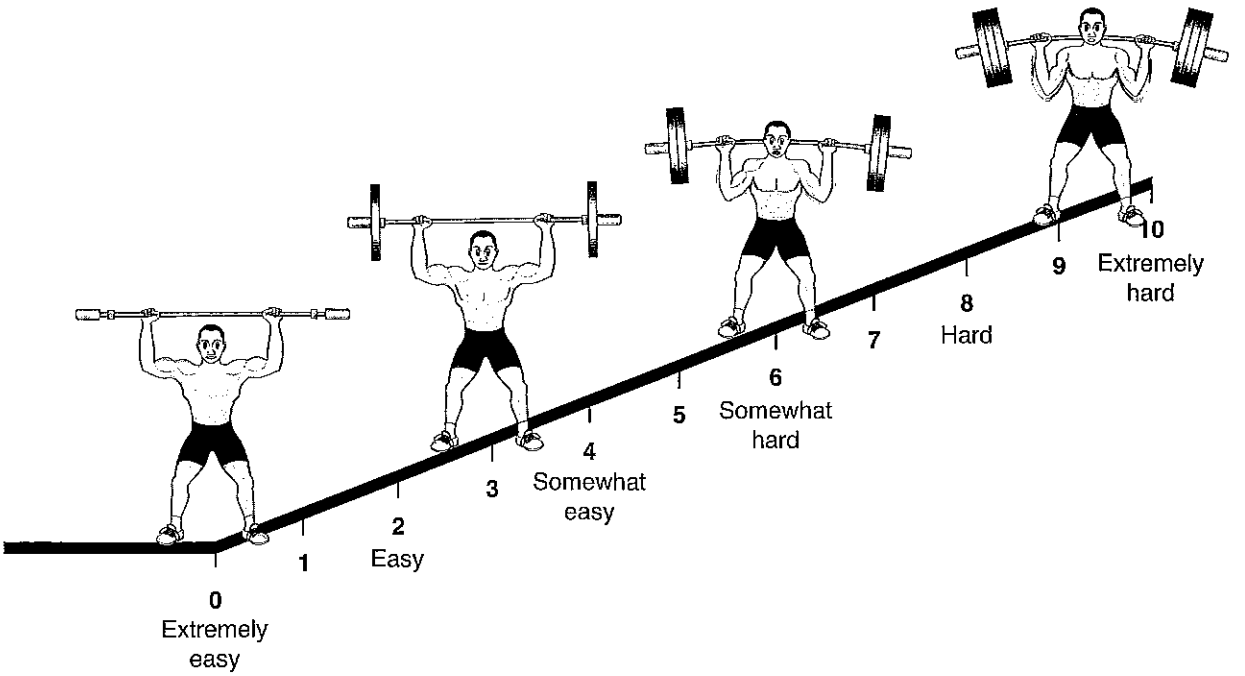


Figure 2.1 OMNI-resistance exercise scale.
Reprinted, by permission, from R.J. Robertson, 2004, *Perceived exertion for practitioners* (Champaign, IL: Human Kinetics), 49.

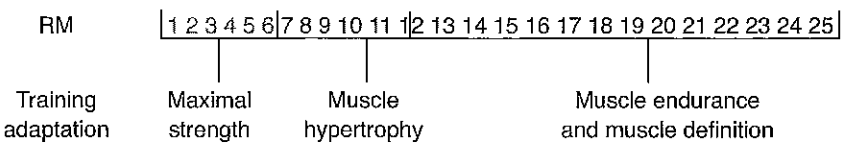


Figure 2.2 Continuum of repetition maximums.
Modified from S.J. Fleck and W.J. Kraemer, 2004, *Designing resistance training programs*, 3rd ed. (Champaign, IL: Human Kinetics), 167.

maximums of 12 and above, or 70 percent of 1RM and below, are used (Stone and Coulter 1994). These varied muscle adaptations underscore the importance of periodization for producing the most desirable changes in a muscle, whether the person's goal is increasing muscle endurance or increasing maximal strength. This is because each adaptation is related to the others. For example, increasing both maximal strength and muscle endurance beneficially affects muscle hypertrophy. So while the person should spend the majority of training time using the repetition range that best fits his or her major goals, the periodic cycling of other intensities will enhance this goal.

One major assumption that the continuum of repetition maximums makes is that all repetitions are performed at a moderate speed. Yet the speed of a rep can be increased or decreased, particularly at light to moderate loads. And this change in speed will dramatically alter the muscle adaptations. In general, fast repetition speeds with very light weight are best for building speed strength, or power, when few repetitions are performed. In contrast, slow to moderate repetitions with a submaximal weight are better for producing adaptations in muscle endurance and hypertrophy as the time the muscle is under tension is increased. As an example, using a weight that is about 30 to 45 percent of 1RM to do three reps as fast as possible builds speed strength (power) and has little effect if any on muscle hypertrophy or endurance.

REST PERIOD BETWEEN SETS

How long a weightlifter should rest between sets is dependent on numerous factors. These include the resistance being used, the goals of the lifter, and the metabolic pathways that need to be trained. The general consensus is that the lower the reps being performed (that is, the higher the resistance intensity), the longer the rest periods that should be taken. And so as the periodized routine alters resistance intensity, so too do the rest periods change accordingly.

If a person is training for maximal strength or power, he or she should take long rest periods between sets. This is because lifting heavy weight for low reps requires energy derived from anaerobic metabolism, called the ATP-PC (adenosine triphosphate-phosphocreatine) system. This metabolic pathway provides the immediate energy required for lifting heavy weight or performing explosive movements for a short period. This system requires more than 3 minutes of rest for the majority of recovery to occur. Therefore, the recommendation is to rest at least 3 to more than 5 minutes when training for maximal strength or power. The general guidelines are as follows: resistance at less than 5RM requires over 5 minutes of rest, 5-7RM requires 3-5 minutes, 8-10RM requires 2-3 minutes, 11-13RM requires 1-2 minutes, and over 13RM requires about 1 minute (Kraemer 2003). This level of rest ensures that fatigue will be minimal at the start of a new set, and in turn, strength can be near maximal. Similarly, if a strength athlete or other athlete performs short bouts of high-intensity exercise with long rest periods between, the athlete should rest at least three minutes between sets.

When training for muscle hypertrophy (which is best attained with reps in the range of 8 to 12), shorter rest periods appear to be the most beneficial. Resting less than three minutes between sets stresses the anaerobic energy systems, and this is often recommended for bodybuilding training. This is because fatigue is believed to play some role in the pathways leading to muscle growth. One possibility involves lactate, which dramatically increases as reps increase and rest between sets decreases. There is a strong relationship between lactate and levels of growth hormone after a bout of weightlifting. Increased levels of growth hormone are associated with a higher anabolic response.

For athletes interested in improving muscle endurance, low intensity (less than 60 percent 1RM), high repetitions of 15 and beyond, and short rest periods (under one minute) seem to be the best plan. This plan allows them to train to the point of fatigue and beyond, which enhances the body's ability to use lactate as an energy source and even improves aerobic capacity to some degree. Because fatigue is associated with muscle hypertrophy, many bodybuilders also frequently use this style of training.

Some styles of training use such minute rest periods between sets that they are classified in gym circles as using "no rest" between sets. This means that you would take no deliberate rest but instead immediately move to the next exercise. Such training methods include circuit training and the various forms of superset training, which includes compound sets, triple sets, and giant sets (see chapter 6 for more detailed explanations of these methods). With each of these methods, a certain number of sets of different exercises are done back to back with no rest between exercise sets. Only after you complete the prescribed number of exercises (which can vary from 2 to as many as 12) would you take a rest period. Then you would repeat the cycle anywhere from one to five times depending on the program.

ADDITIONAL FACTORS

Besides determining the best exercises to use, the correct order of those exercises, the proper resistance to use, the optimal number of sets to do, and the right amount of rest to take between sets, other factors are to be considered. Some strength training experts believe that repetition speed—the length of time it takes to complete one rep—should also be manipulated. Typical rep speed in strength training lasts about three to five seconds. This is considered a controlled pace and is the pace taught by most strength coaches and personal trainers. However, some programs rely on the manipulation of rep speed. Speeding up the time it takes to complete a rep—in the range of two seconds or less—has been shown to be

an effective way to increase muscle power. See Ballistic Strength Training on page 175 in chapter 9 for an explanation of how to train with fast reps. Some strength training experts also believe that slowing down a rep—in the range of 10 to 20 seconds—can also enhance muscle strength as well as size. Research in this area is lacking, but anecdotal reports are positive. See Slow-Repetition Training on page 89 in chapter 6 for an explanation of how to train using very slow reps.

Another factor you should also be concerned about is how frequently you train. The frequency at which muscle groups are trained can be more critical than any of the acute variables of training discussed previously. The reason has to do with recovery. It is generally accepted that you should wait until a muscle has recovered from a previous workout before training the muscle again. Muscle recovery, however, is an individual thing that is influenced by factors such as lifting experience, intensity of the workout, and total volume. In most instances it is best to get 2 to 7 days of rest for each muscle group. This will be determined by how you split your training. *Training splits* refer to how you break down training days. For example, do you train your whole body during every workout, or do you train only one or two muscle groups each workout? For obvious reasons, the more workouts it takes you to train all the major muscle groups of the body, the more rest you will take between workouts for the same muscle group. Training splits and training frequency are discussed in more detail in chapters 5 and 8.

SUMMARY

The design of every workout is a critical component of the design of the strength training program. Regardless of your goal, you must carefully select appropriate acute variables to optimize the adaptations that occur in every workout. In designing the most effective training programs to reach your goals, you must carefully consider the choice of exercises and the order, intensity used, number of sets performed, and rest periods between sets. In addition to these variables, you may want to consider the speed at which you perform your reps. Last but not least is the frequency at which you train muscle groups. This basic information in this chapter will make more sense after you read about training details in parts II and III.

CHAPTER 3

Training Cycles

The term *periodization* refers to the systematic manipulation of the acute variables of training (as discussed in chapter 2) over a period that may range from days to years. The original concept was developed in the former Eastern Bloc countries in the late 1950s to optimize athletes' adaptations to resistance training. More important, periodization revolves around the athlete's competitive calendar so that he or she is at a competitive peak for competition.

The basis of periodization is general adaptation syndrome (GAS), which describes three stages that an organism—such as an athlete—goes through when exposed to a novel stress (Selye 1936). As a new stress is placed on the body (for example, heavy training in the range of three to five reps), the muscle first goes through an alarm reaction. During this stage the athlete momentarily gets weaker. But with continued exposure to the stress (successive workouts), the body enters the stage of adaptation. In this stage the body supercompensates for the stress—such as increasing muscle strength—to better deal with the stress. If the body is continually exposed to the same stress for too long, it may enter the stage of exhaustion, where its adaptation to the stress may actually decline. This may mean that the strength gains the athlete made during the adaptation stage will cease, and stagnation may set in. It may even lead to an actual decline in strength. Although this theory is now considered a simplistic take on the body's response to stress, it does hold true and explains the reason periodization is so important for proper adaptation to strength training.

You must expose the muscle to any one training style for just long enough to reap the benefits but avoid a nosedive of those positive adaptations. At this stage a new training style should be introduced, and the cycle continues. A simplistic take on periodization is the maxim of "everything works, but nothing works forever." This is a major theme of this book and is the reason it offers so many training methods. Having a large arsenal of training methods (as provided in chapters 6 and 10) to use for short periods and continually cycling them in a systematic order will prevent stagnation and maximize training adaptations.

The three periodization schemes most commonly used by strength coaches, which are the three most extensively researched, are classic strength and power periodization, reverse linear periodization, and undulating periodization. Although there are many other more obscure periodization schemes out there, a discussion including these three will cover the premise behind periodization. Regardless of the exact plan, periodized strength training programs have been shown through research to be significantly more effective than nonperiodized programs for increasing strength, power, and athletic performance in both men and women (Kraemer et al. 2003; Marx et al. 2001; Rhea and Alderman 2004; Willoughby 1993).

CLASSIC PERIODIZATION

The name implies that this system is the hallmark periodization scheme most associated with the term *periodization*. In its most general form, classic periodization divides a long-term training period called the *macrocycle* (which typically involves six months to one year but may be up to four years, such as with Olympic athletes) into smaller phases called *mesocycles* (usually lasting several weeks to months), which are also subdivided into weekly *microcycles*. The strength training progresses over the macrocycle from low resistance (intensity) to high intensity with total volume following the opposite progression, from high to low. A

schematic overview of the classic strength and power periodization scheme can be seen in figure 3.1 and table 3.1.

Figure 3.1 represents the most common periodization format used for increasing strength and power. The first phase, or mesocycle, is classified as the hypertrophy phase and is categorized as being low intensity. Reps are around 8 to 12 and sometimes as high as 20. It is considered very high in volume because sets are usually in the range of 4 to 5 for each exercise. The goal of this phase is typically to prepare the athlete for the high-intensity training that is to follow. The muscle hypertrophy experienced in this phase will enhance the gains in strength and power an athlete will make in the later stages. Although this is termed the *hypertrophy phase,* it should not be confused with a periodized program a bodybuilder would use. Hypertrophy is the main goal in a bodybuilding program, not something an athlete may do only for several months. In some periodized programs designed for athletes, the hypertrophy phase may be preceded by what is known as a *general preparedness (GP) phase*. This is especially true if the person being trained is a rank beginner or an athlete who is returning after an off-season where little, if any, training took place. This would provide a means of preparing an athlete for the hypertrophy phase with very low intensity and moderate- to high-volume training.

The next mesocycle is usually the strength phase. As the name implies, the major goal during this phase is to maximize muscle strength. This phase is typically moderate to high in intensity with reps in the range of two to six and the goal to build up muscle strength. It's somewhat high in volume, with three or four sets performed per exercise and fewer total exercises performed per muscle group than during the hypertrophy phase. Following the strength phase is the power phase. It is similar to the strength phase in that the intensity is high (reps are in the range of two to three). The volume is a bit lower; sets usually are about three per exercise. The point of this phase is to start transferring the strength gains made during the first two phases into more explosive power that serves well for competition.

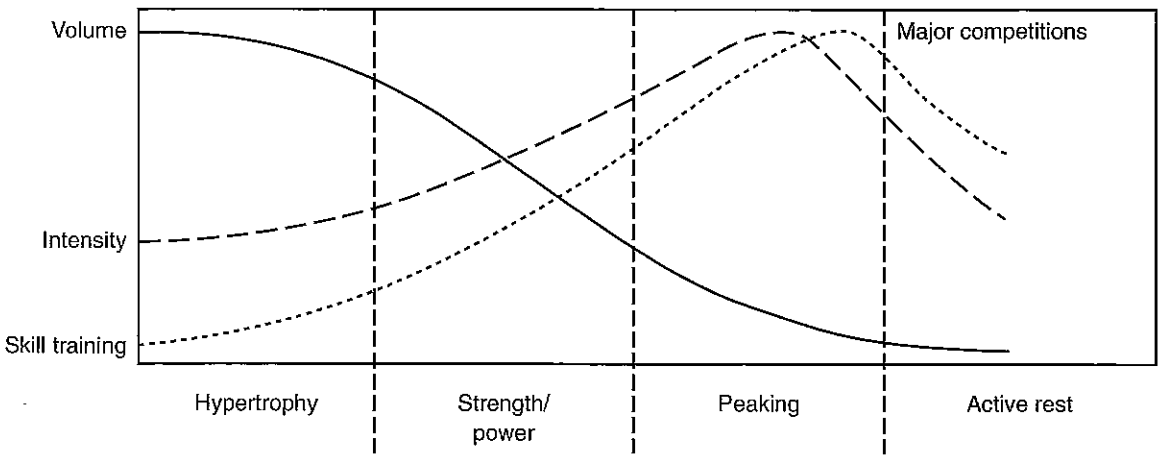


Figure 3.1 Classic strength and power periodization scheme.

Adapted, by permission, from S.J. Fleck and W.J. Kraemer, 2004, *Designing resistance training programs*, 3rd ed. (Champaign, IL: Human Kinetics), 213.

Table 3.1 Classic Strength and Power Periodization Model

Training phase	Hypertrophy	Strength	Power	Peaking	Active rest
Sets	3-5	3-5	3-5	1-3	Light physical activity
Reps per set	8-12	2-6	2-3	1-3	
Intensity	Low	Moderate	High	Very high	
Volume	Very high	High	Moderate	Low	

Adapted by permission of Edizioni Minerva Medica from: *Journal of Sports Medicine and Physical Fitness* 1981; 21(4) 344.

The final two mesocycles prepare the athlete for competition. The peaking phase follows the power phase. It is categorized by low volume (only one to three sets per exercise are formed) and very high intensity (reps as low as one per set). This phase gets the athlete ready for competition by maximizing strength and power. After this phase, the athlete drops the strength training and undergoes a period of active rest just before competition. The active rest phase is categorized by activity other than strength training such as swimming, hiking, or sport activities like basketball and tennis. This phase usually lasts for only about one to two weeks before a competition to allow the body to recover from all the strenuous training so that it can perform at its best. After competition, this phase may actually continue for several weeks before the periodized training scheme starts again. For this reason, the active rest phase is often referred to as the *transition phase*. Most strength experts using the classic strength and power periodization program will continue the mesocycle phases for anywhere from three weeks to three months. However, a compressed version of this program would involve changing the phases (hence the intensity and volume) every week. Then the cycle repeats itself.

Although classic strength periodization schemes can allow for adaptations in strength training, some issues need to be considered with these models. The first consideration is the fact that the higher-volume training phase may lead to fatigue if followed consecutively for too long. This could be a problem for athletes who must compete at various times throughout the year. The second consideration is the fact that the muscle hypertrophy gained during the hypertrophy phase may not be maintained very well during the later stages, where volume gets considerably low. This could be a problem for bodybuilders and other athletes who are concerned about muscle mass. Therefore, other periodized schemes have been developed and tested in the gym as well as in the lab.

REVERSE LINEAR PERIODIZATION

Reverse linear periodization takes the classic strength and power periodization scheme and runs it backward. Whereas the goal of the classic periodization model is to maximize an athlete's strength and power, the goal of the reverse linear model is to maximize muscle hypertrophy or endurance strength, depending on the rep range that the program concludes with (8 to 12 for hypertrophy and 20 to 30 for endurance strength).

Research supports the concept that the reverse linear periodization scheme is more effective for increasing endurance strength than the classic model (Rhea et al. 2003).

In essence, the reverse linear model starts with the power phase, where intensity is very high (two or three reps per set) and volume is low (three sets per exercise). The peaking phase is usually skipped because the athlete is not preparing for a competition in which power and strength matter. After the athlete follows the power phase for several weeks, the strength phase starts. Again, the strength phase uses moderate to high intensity (two to six reps per set) and slightly higher volume than the power phase (three or four sets per exercise). The goal of these first two phases is to build the strength and power to optimize gains in mass or endurance strength.

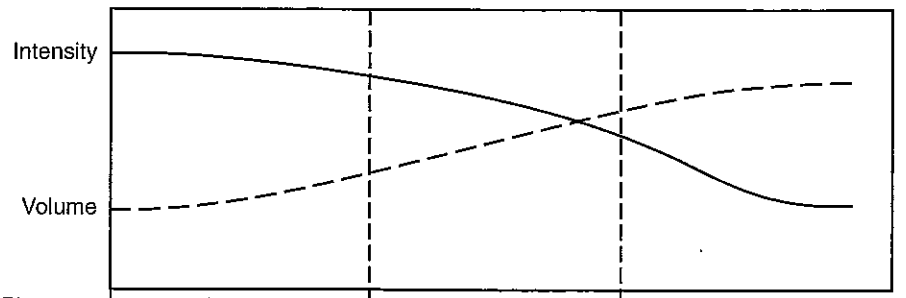
Being able to lift heavier weight for the desired number of reps during the hypertrophy phase can result in significant gains in muscle mass as well as muscle endurance. The hypertrophy stage comes last in the program and involves lower intensity (8 to 12 reps per set) and high volume, which is the best prescription for building muscle mass. This stage is a good systematic approach to gaining muscle mass, which makes it a smart periodized plan for bodybuilders. See figure 3.2 for a sample reverse linear periodization scheme for muscle hypertrophy.

To make the reverse linear model a better fit for optimizing endurance strength, the power phase can be eliminated. That means it would start with the strength phase, then move to the hypertrophy phase, then move to an endurance phase (where the reps are in the range of 20 to 30), and finally move to an active rest phase if the athlete is training for a competition. A diagram of this model is shown in figure 3.3. As with any periodization scheme, the acute variables can be manipulated within each stage to improve the result of the program. For instance, a reverse linear model can start with reps in the 8 to 10 range, then progress to the range of 12 to 15, and end in the range of 20 to 30.

UNDULATING PERIODIZATION

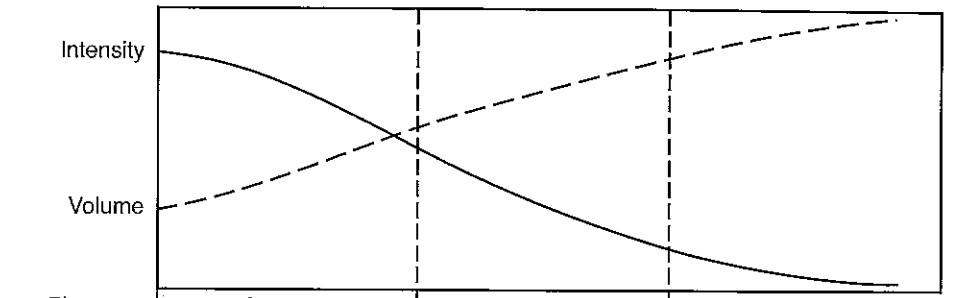
As the name implies, undulating periodization follows a less linear scheme than does the classic strength (power) scheme or the reverse linear periodization scheme. Undulating models are gaining in popularity in strength rooms because of their convenience and effectiveness.

Undulating periodization schemes typically follow a 14-day mesocycle with three or four different workouts to stagger (see table 3.2). This way, instead of sticking with one training phase for several weeks or more, the lifter can change intensity and volume from one workout to another. For example, if the lifter were following a whole-body training split, he or she might perform the strength workout on Monday, the endurance strength workout on Wednesday, and the hypertrophy workout on Friday. The following week the lifter may train the endurance strength workout on Monday, the hypertrophy workout on Wednesday, and the strength workout on Friday. If the lifter trained the upper body on Mondays and Thursdays and the lower body on Tuesdays and Fridays, he or she might then do hypertrophy workouts on Monday and Tuesday and strength workouts on Thursday and Friday. The following week the lifter might train



Phase	Power	Strength	Hypertrophy
Sets	3	3-4	3-6
Reps/set	2-3	2-6	8-12
Intensity	Very high	High	Low
Volume	Low	Moderate	High

Figure 3.2 Reverse linear periodization scheme for hypertrophy.



Phase	Strength	Hypertrophy	Endurance
Sets	3-4	3-6	3-6
Reps/set	2-6	8-12	15-30
Intensity	High	Low	Very low
Volume	Moderate	High	Very high

Figure 3.3 Reverse linear periodization scheme for endurance strength.

Table 3.2 Undulating Workouts

Type of workout	Sets	Reps	Rest between sets
Strength workout	3-5	2-4	4-5 min
Hypertrophy workout	3-4	8-12	2-3 min
Endurance strength workout	3-4	15-30	1-2 min

with endurance workouts on Monday and Tuesday and strength workouts on Thursday and Friday. After the two-week mesocycle the lifter could switch back to a different workout and perform the mesocycle over again, or the lifter can take a week off (especially if a competition is scheduled) and then return to the 14-day mesocycle.

One of the great things about undulating periodization is that it requires less organization and planning than linear periodized programs require. For instance, if a person felt tired or sick (or conversely, the person felt exceptionally motivated and strong one day), the workout could be changed for that day to better suit mood and physical health. Or if scheduling was a problem and the lifter was short on time one day, he or she could switch to a workout with lower volume. Although it seems that such a training system that requires little planning would be less effective than a program that is scheduled months in advance, research has found that undulating periodized programs are just as effective as linear periodized models for the development of strength, power, and muscle mass (Marx et al. 2001; Kraemer et al. 2000) and are more effective than nonperiodized programs. One study by Rhea, Ball, Phillips, and Burkett (2002) found that undulating periodized training was more effective for developing strength compared to a linear periodized plan.

In actuality, the sporadic nature of the undulating program works as a default for building muscle, strength, and power. That's because periodization is based on the fact that a physiological system makes adaptations to a stress that it is exposed to. Yet if the system is exposed to the stress for too long, the adaptations will plateau and even reverse to some degree. Given that, the undulating periodized scheme allows the stress (strength training) to be encountered for very short periods before it is changed and then cycled back in. In this model, the different types of strength training (heavy, light, fast, or whatever) are cycled repeatedly from day to day. So it helps to keep the muscle from getting used to the stimulus, yet it exposes it frequently enough to cause progressive adaptations.

TYPES OF TRAINING CYCLES

Periodization is a term used by strength coaches, experts, and athletes who have been educated on the matter. Rarely will you hear the term used in the gym by bodybuilders or powerlifters. These athletes refer to the concept of periodization as *cycling*. It may sound cooler, but cycling is just a simpler term for periodization. Although the minor details of cycling for powerlifters and bodybuilders are slightly different from the three periodized schemes discussed previously, they rely on the same premise: Change is good.

Powerlifters use several types of cycles to prepare for a competition. A multitude of these are presented in chapters 9 and 10. The most common cycle uses a gradual increase in the amount of weight used over time. Usually this starts out as low as 50 percent of the lifter's 1RM and progresses up to 100 percent of the 1RM weight for that lift over a 6- to 12-week period. See table 3.3 for a sample 11-week powerlifting cycle.

Bodybuilders also use numerous cycling strategies. In fact, an unlimited number of bodybuilding cycles could be used. These are covered in chapters 6 and 7. The most common ones used are similar to the reverse linear periodization scheme (table 3.4) and the undulating periodization scheme (table 3.5). Although these athletes mix up their training frequently, the focus tends to stay on reps in the moderate to high range (8 to 20). Occasionally, these athletes train with heavy weight and low reps, but these phases are short and infrequent.

Table 3.3 Strong Cycle

Week	% 1RM	Reps	Sets
1	55%	5	5
2	60%	5	5
3	65%	5	5
4	70%	5	5
5	75%	5	5
6	85%	3	3
7	90%	3	3
8	95%	3	3
9	95%	2	2
10	100%*	2	2
11**	–	–	–

*Based on previous max.
**Active rest

Table 3.4 Linear Muscle

Weeks	Reps	Sets (per exercise)	Rest between sets
1-2	6-8	3	3-4 min
3-4	8-10	3	2-3 min
5-6	10-12	3	1-2 min
7-8	12-15	3	<1 min

Table 3.5 Undulating Muscle

WEEK 1			
Day and muscle groups	Reps	Sets (per exercise)	Rest between sets
Monday (chest, shoulders, triceps)	8-10	3	2-3 min
Tuesday (back, biceps)	12-15	3	<1 min
Wednesday (legs)	6-8	3	3-4 min
Thursday (chest, shoulders, triceps)	12-15	3	<1 min
Friday (back, biceps)	6-8	3	3-4 min
Saturday (legs)	10-12	3	1-2 min
WEEK 2			
Day and muscle groups	Reps	Sets (per exercise)	Rest between sets
Monday (chest, shoulders, triceps)	6-8	3	3-4 min
Tuesday (back, biceps)	10-12	3	1-2 min
Wednesday (legs)	8-10	3	3 min
Thursday (chest, shoulders, triceps)	10-12	3	1-2 min
Friday (back, biceps)	8-10	3	3 min
Saturday (legs)	12-15	3	<1 min

SUMMARY

Regardless of whether the goal is to increase power and strength or muscle growth, periodization (or cycling) is a necessary method for making continual progress. Only by cycling the training phases is it possible to keep the muscles adapting and prevent them from stagnating. Fortunately, numerous periodization methods can be employed. These include classic linear periodized schemes, reverse linear schemes, and undulating schemes. So while any one periodization scheme will provide sufficient variability in the training program, using different periodization schemes promotes training variability and progress. Over time you should try them all to decide what scheme works best for you. From there, you can choose to use that cycle as your primary scheme or frequently change up your cycles as you should for acute variables of training.

CHAPTER 4

Strength Training Equipment

There is an abundance of equipment that you can use for the purpose of strength training. Although some of these pieces of equipment are more complicated or sophisticated than others, all have their advantages and disadvantages. Regardless of how simple or innovative, most strength training devices fall into one of three categories: those that provide constant resistance throughout the range of motion, those that provide variable resistance (whether controlled or not) throughout the range of motion, and those that provide a constant speed throughout the entire range of motion. In addition, some novel pieces of strength training equipment do not fit into the standard categories, such as vibration. This chapter covers the more common forms of strength training equipment as well as some that are not so common.

SIMPLE RESISTANCE

The first category of strength training equipment provides constant resistance throughout the entire range of motion. This is the simplest form of resistance and is composed of little more than objects that provide weight. The mass of the object, whether it be a dumbbell or a weight stack, provides resistance through gravity. Any time you attempt to pick up a free object, you are fighting the force of gravity, which pulls the object to the ground. The type of contraction that the muscle goes through when lifting a free object is termed *isotonic*. It literally means same tone or tension, because the weight stays the same while you lift it. If the object is too heavy to move, the type of contraction the muscle goes through is *isometric*. Because the mass of any object can be used in this manner, this category of strength training equipment is the largest and is composed of the widest range of equipment.

Free Weights

The term *free weights* refers to equipment moved in the performance of an exercise, which is simply raised and lowered as a complete unit. It is called *free weight* because the weight is free to move in any direction and in any manner. Technically, any object can be considered free weight; however, the term usually refers to the weight plates and barbell or dumbbell systems and related items found in home and commercial gyms.

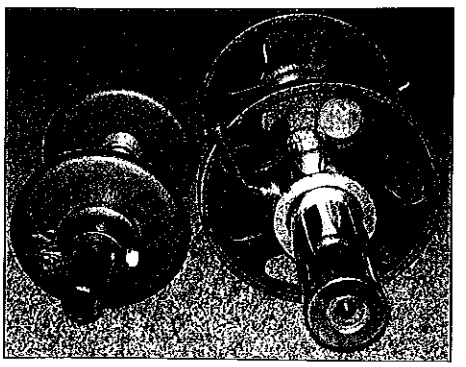


Figure 4.1 Standard bar and plates (left) contrasted with Olympic bar and plates (right).

barbell—The bar that weight plates are loaded onto for purposes of strength training. Barbells normally measure between five and seven feet in length, depending on the type of barbell. There are several different types of barbells:

Olympic barbell—A special type of barbell used in Olympic weightlifting and in powerlifting competitions as well as in gyms (see figure 4.1). These bars weigh 20

kilograms (just under 45 pounds) and are seven feet in length. The ends of the bar are two inches (five centimeters) in diameter to fit Olympic weight plates, and the handle section where you grab the bar is one inch (two and a half centimeters) in diameter. Parts of the handle section are knurled for better gripping. Some gyms have shorter versions of these bars.

standard barbell—Similar to Olympic barbells in that the gripping portion is usually one inch in diameter and knurled in sections. However, these barbells have ends that are one inch in diameter to fit standard weight plates.

fixed barbell—A barbell with a predetermined weight (see figure 4.2).

EZ curl bar—A special type of barbell that is bent at several points so that it looks like a stretched-out W (see figure 4.3). This allows the user to have a grip that is somewhere between a fully supinated grip (underhand grip) and a neutral grip. The purpose of this is to take stress off the wrists as well as place more stress on the long head of the biceps (outer biceps). An EZ curl bar is occasionally called a cambered curling bar.

fat bar—A special barbell or dumbbell that is larger in diameter on the gripping portion of the bar than the conventional bars that are one inch in diameter. Fat bars usually come in two-inch and sometimes three-inch (five- or eight-centimeter) diameters. Training with fat bars allows users to develop greater grip strength than they would by using a standard one-inch bar.

safety squat bar—A bar that resembles a barbell with two short padded bars (about 12 inches, or 30 centimeters) that run perpendicular to the bar from the middle. These padded bars rest on the shoulders and allow the user to grab them as a handle while squatting (see figure 4.4).

trap bar—A weight bar with a diamond-shaped section in the middle. During the exercise, the lifter stands inside the diamond and grips the transverse handholds on either side of the diamond. This type of bar is typically used for shrugs and deadlifts (see figure 4.5).

weight plates—The round steel plates that add weight to barbells and plate-loaded weight machines. There are generally two types of weight plates, but regardless of the type of weight plate, these are commonly available in weights of 1.25, 2.5, 5, 10, 25, 35, 45, and even 100 pounds:

Olympic weight plates—These plates have center holes that are 2-1/8 inches (about 5.4 centimeters) in diameter to fit on Olympic barbells.

standard weight plates—These plates have center holes that are about 1-1/8 inches (about 3 centimeters) in diameter to fit on a 1-inch standard bar.

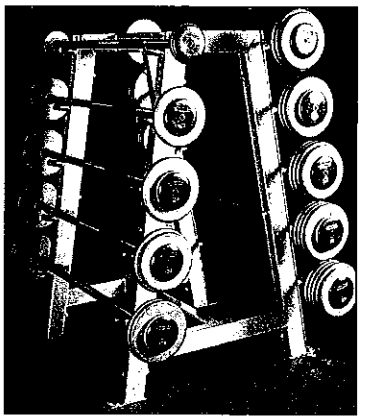


Figure 4.2 Fixed barbells on a rack.

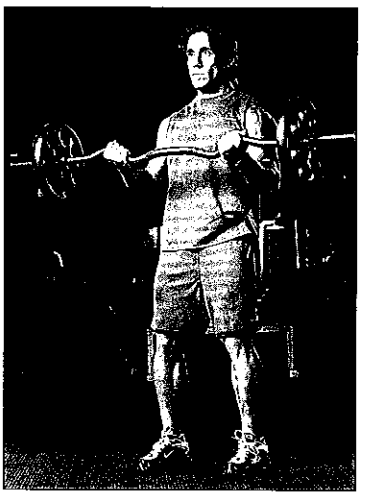


Figure 4.3 Curls with an EZ curl bar.

Figure 4.4 Squatting with a safety squat bar.

bumper plates—An Olympic weight plate with a rubber outer rim to reduce damage to the floor and the weight plate in the event that it is dropped. These are most commonly used in Olympic weightlifting where very heavy weights are lifted overhead and then dropped.

collar—The clamp used to hold plates securely in place on a barbell or adjustable dumbbell. The collars used in powerlifting and Olympic weightlifting weigh 5.5 pounds (2.5 kilograms).

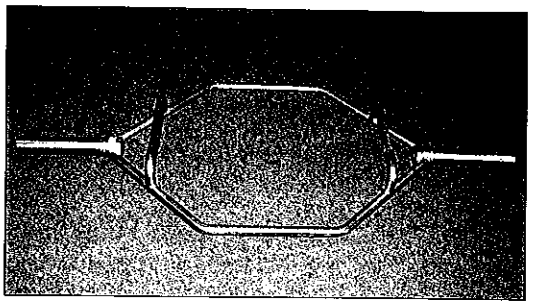


Figure 4.5 Trap bar.

dumbbell—A short-handled barbell intended primarily for use with one hand. It is usually about 8 to 12 inches (20 to 30 centimeters) in total length; the knurled gripping portion is about 6 inches (15 centimeters) on most dumbbells. Some dumbbells are solid steel with round or hexagon ends, while others use weight plates and can be adjusted to different weights.

Specialty Free-Weight Objects

Some free-weight objects don't fall under the typical category of dumbbell or barbell. These unique objects provide weight for many conventional and unconventional exercises.

medicine ball—A weighted leather or rubber ball that varies in size from that of a volleyball to a basketball, depending on the weight (2 to 30 pounds, or 0.9 to 14 kilograms). Medicine balls can be used for throwing exercises or to simulate most typical exercises done with barbells or dumbbells (see figure 4.6).

kettlebell—This cast-iron free weight resembles a cannonball with a solid handle welded to it. Kettlebells come in weights as low as 15 pounds to as high as 50 (about 7 to 23 kilograms), usually in 5- or 10-pound increments. They can be used for a variety of exercises but are mainly used for performing swings, snatches, and cleans.

head harness—A leather or nylon head strap that has a chain attached from one side to the other. Weight plates are added to the chain and the device is worn on the head to provide resistance for neck-strengthening exercises (see figure 4.7).

weighted belt—This equipment resembles a short weight belt that fits around the small of the back along with a long chain that runs from one side of the belt to the other. Weight plates are added to the chain and supported around the waist for adding resistance during body-weight exercises such as dips and pull-ups.

weight vest—This device is simply a nylon vest with pockets that hold 1- to 2-pound weights. Total weight usually adjusts between 2 and 40 pounds (0.9 to 18 kilograms). This is often used to increase the weight on body-weight exercises such as push-ups as well as bounding and running exercises.

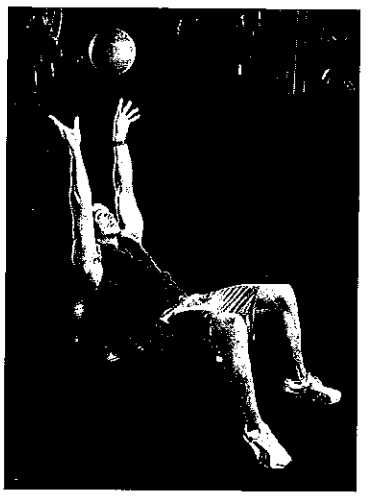


Figure 4.6 Throwing a medicine ball.

Figure 4.7 Neck extensions with a head harness.

wrist roller—This device is simply composed of a short steel or wooden handle with a three- to four-foot (91- to 122-centimeter) rope attached to it (see figure 4.8). On the other end of the rope weights are attached. To train the forearm flexors, a lifter would roll the handle with a forward motion to lift the weight from the floor until the rope is completely wrapped around the handle. To train the forearm extensors, the lifter would roll the handle in a reverse motion.

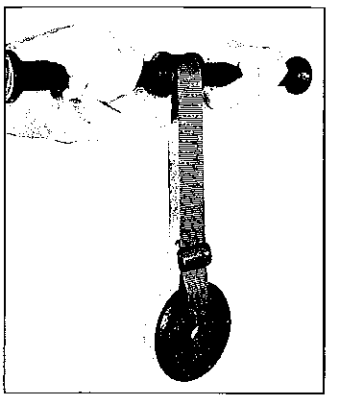


Figure 4.8 Wrist curls with a wrist roller.

arm blaster—This aluminum device is used to prevent movement of the upper arms when doing biceps curls. It has straps that suspend it from the shoulders so that it sits firmly against the waist allowing the backs of the arms to press against the arm blaster while the lifter performs curls (see figure 4.9).

Free-Weight Accessories

Besides the resistance component of strength training with free-weight objects, many exercises require the use of various benches and racks to support the lifter and the free weight.

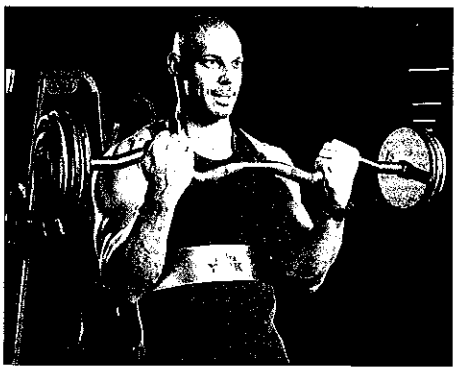


Figure 4.9 Barbell curls with an arm blaster.

weight benches—Various benches are used along with free weights and are specifically designed for certain barbell exercises. These weight benches have supports for barbells to allow the lifter to easily rack the barbell at the end of the set. Following are some types of benches:

bench-press bench—A horizontal bench with vertical barbell supports.

incline bench-press bench—A bench that is angled up at about 35 to 45 degrees from the floor so that when a lifter sits on it the head is higher than the hips. The bench is welded to a steel structure that has vertical barbell supports and a step platform for a spotter to watch over the lifter performing the incline bench press exercise.

decline bench-press bench—A bench that angles down about 30 to 40 degrees so that the head is lower than the feet. There are barbell supports for doing decline barbell bench presses.

shoulder press bench—A bench that has a padded seat and vertical seat back so that when the lifter sits on it the torso is vertical, as it should be when doing the barbell shoulder press exercise. The bench is welded to a steel structure that has vertical barbell supports that sit behind the lifter's head so that he or she can easily grab the bar at the start of the set and can rack it without stressing the shoulder joint at the end of the set.

preacher bench—A bench that has a seat and a padded armrest that is angled at about 45 degrees to the floor and set in front of the lifter. In front of the armrest is a barbell support. The lifter sits on the seat with the upper arms supported on the armrest and performs biceps curls.

free-standing benches—Some benches do not have barbell supports because they are used mainly with dumbbells. These benches consist of just the padded bench and leg supports and include the following:

flat bench—A fixed horizontal bench that is used for seated or lying exercises that are performed prone or supine.

adjustable-incline bench—A bench that allows the angle of the surface to be adjusted from horizontal to vertical with various points in between.

adjustable-decline bench—A bench that angles down at varying degrees so that the head is lower than the feet. This is often used for chest and abdominal exercises.

low-back bench—A bench that has a short horizontal seat and a low vertical back pad to support the back during exercises such as overhead presses and triceps extensions.

weight rack—A rack that supports a barbell to allow the lifter to grab it from a variety of positions. The following are some types of weight racks:

power rack—The most versatile rack is this safety apparatus that is made of four vertical steel beams to create a cage that is usually about five feet (one and a half meters) long, five feet wide, and seven feet (two meters) tall. The vertical beams have holes drilled into them every one to two inches from top to bottom. The holes allow the barbell hooks to be adjusted to different heights. The holes also fit safety bars that can be used to catch the barbell if the lifter fails to lift the weight. Power racks are typically used for squats, shrugs, and presses (see figure 4.10*a*).

squat rack—A steel structure that has barbell-support hooks at different heights so that lifters of various statures can easily unrack the barbell to perform the squat or other standing exercises. Some squat racks have two horizontal beams that are about three feet (91 centimeters) high and run parallel to each other off the front of the squat rack. These beams act as a safety rack so that if a lifter fails to complete a squat, he or she can rack the weight on the safety beam (see figure 4.10*b*).

stability objects—A multitude of objects can provide unstable support. Unlike a bench, which has a stable foundation to support the lifter's body weight, stability objects are unstable objects that make an exercise more difficult to perform. This helps to develop the strength of the core and stabilizer muscles.

exercise ball—Also known as a stability ball. These inflatable balls come in several sizes (30 to 85 centimeters in diameter). They offer a platform that rolls and gives when a person sits or lies on it, making seated or lying exercises with dumbbells or barbells much more difficult to perform (see figure 4.11). These can also be used with body-weight exercises such as crunches and push-ups.

BOSU balance trainer—This object resembles the top half of a large exercise ball with a solid and stable base. It offers most of the benefits of an exercise ball without the rolling, which makes it ideal for building core strength with standing exercises (see figure 4.12).

stability disc—Small (about 12 to 14 inches in diameter and 2 to 3 inches in height) pancakelike disc made of pliable plastic that a person can stand on or sit on while doing strength exercises (see figure 4.13).

balance board—A wooden base that has a rounded bottom to provide "wobbling" when stood on. These are sometimes used for performing standing strength exercises (see figure 4.14).

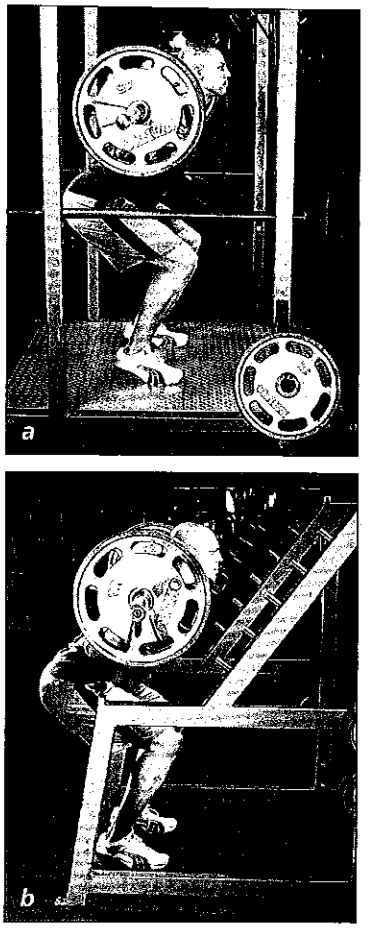


Figure 4.10 *(a)* Squatting in a power rack contrasted with *(b)* squatting in a squat rack.

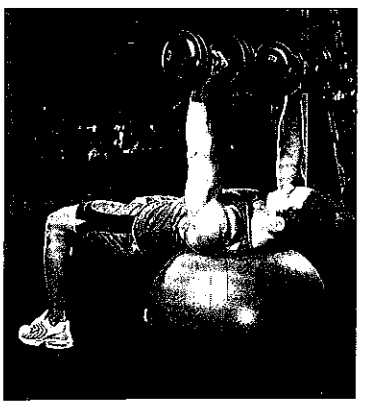


Figure 4.11 Dumbbell presses on an exercise ball.

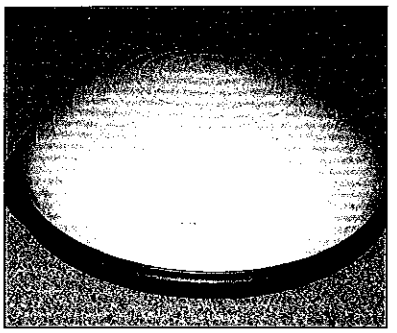


Figure 4.12 BOSU balance trainer.

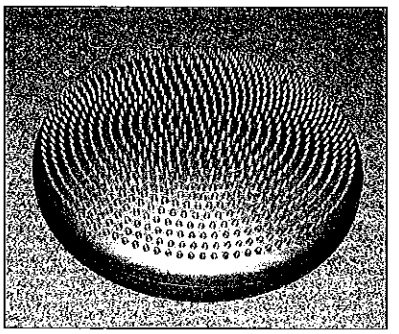


Figure 4.13 Stability disc.

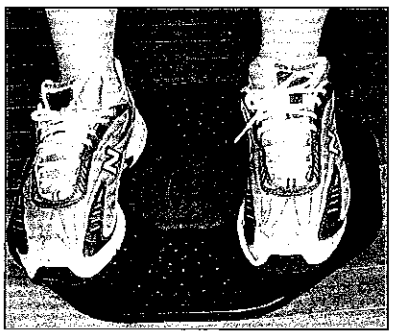


Figure 4.14 Balance board.

Common Objects

Long before dumbbells and barbells were available, athletes and others needing to enhance their strength and fitness used a variety of common objects that served as free weight, such as stones and sacks of sand. Today, although balanced barbells and dumbbells are available, some people use common objects (such as food cans or gallon milk jugs) when they don't have access to standard free-weight implements or choose to lift awkward and unbalanced objects (such as stones and beer kegs) to develop more functional strength. Obviously, any object with mass can be used as a strength training tool—a can of soup, a bucket of water, or a cement cylinder block. Rocks, logs, and tires are common implements to be lifted in strongman competitions. The disadvantage to lifting common objects is the awkwardness. Without a clear handle to grab and without an even balance of weight, lifting common objects requires more functional ability than free weights require. But lifting such awkward implements helps to develop core strength and functional strength.

strongman implements—Strongmen are required to lift a number of awkward objects during competition. Most events combine strength and muscle endurance by requiring the competitors to outdo each other by lifting such objects for the most repetitions or carrying them the most quickly over a certain distance. Some common strongmen implements include the following:

Atlas stone—Atlas stones are large, heavy balls made of granite or concrete that strongmen must lift and carry in competition. Sizes range from 14 inches to more than 60 inches (36 to 152 centimeters) in diameter and weights range from about 140 pounds to well over 300 pounds (64 to 136 kilograms). Competitors typically must lift progressively heavier Atlas stones from the ground and load them onto progressively higher pedestals (up to 60 inches). The competitor who completes the task in the least amount of time wins.

logs—These awkward objects are common to strongman competitions. The modified ones found in competitions have handles carved into them for easier gripping when lifting. These can range in weight from about 200 to well over 300 pounds (91 to 136 kilograms). The winner is the competitor who lifts the heaviest log from the ground to overhead. Aluminum logs are available that have Olympic barbell ends to allow Olympic weight plates to be added for training with different weights.

tractor tires—These can range in weight from about 500 pounds to more than 900 pound (227 to 408 kilograms), depending on the size. In strongman competitions the competitor who flips the tire the fastest over a predetermined distance is the winner.

training adjuncts—Some common objects are used for enhancing strength in the gym or on the playing field. The unique mass characteristics of the object (unbalanced weight or progressive weight) offer benefits that free weights don't. Such implements include the following:

chains—Steel chains can be attached to an Olympic bar to provide progressive resistance during barbell exercises such as the bench press or squat. The unique thing about chains is that as each link lifts off the ground, the weight being lifted increases, offering progressive resistance throughout the range of motion.

beer keg—An empty beer keg weighs approximately 30 pounds (14 kilograms). The handles on a beer keg make it easy to grip, but the rotund shape makes it awkward to lift and control. Some strength coaches have their football, basketball, baseball, and hockey players as well as other athletes lift kegs as a way to develop more functional strength.

everyday objects—Objects that are found in most homes can be used in place of free weights when free weights are unavailable for standard strength training exercises. Some objects commonly used include the following:

soup cans—These can range in weight from 10 ounces to a little over 1 pound (.28 to .45 kilogram). Similar to dumbbells, soup cans can be held in the hands for almost any exercise that would normally be performed with dumbbells. Because of the limit in weight available, cans are best suited for people with poor strength or for those performing workouts that have very high reps.

gallon jugs—Plastic gallon jugs weigh about 8 pounds (4 kilograms) when filled with fluid or 14 pounds (6 kilograms) when filled with sand. The handles allow them to be gripped in a fashion similar to that of dumbbells (although they're more awkward to lift). The weight can be adjusted by altering the amount of fluid or sand in the jugs.

Human Body

Your own body weight or that of a training partner can be used as a form of resistance.

own body weight—Exercises such as push-ups, chin-ups, dips, body-weight squats, and crunches use pure body weight, nothing else, to get the job done (see figure 4.15).

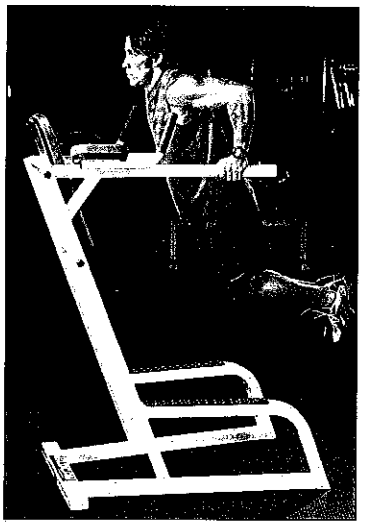


Figure 4.15 Dips.

partner body weight—When training with a partner, you can do a variety of exercises that use the partner's body weight as resistance. For example, rows, bench presses, and squats can all be done with the weight of a training partner (see figure 4.16).

body-weight exercise accessories—Certain equipment has been designed for use with exercises that primarily rely on one's body weight:

chin-up bar—A chin-up bar is simply a horizontal bar that is mounted to its own stand, wall, ceiling, doorway, or other exercise apparatus (such as a power rack or cable crossover).

dip bars—Parallel bars set high enough above the floor to allow dips to be performed between them. They can also be used for leg raises for the abdominals and for a variety of other exercises. Some dipping bars are angled inward at one end so that the distance between the two bars is different. This allows you to perform dips with varying grip width.

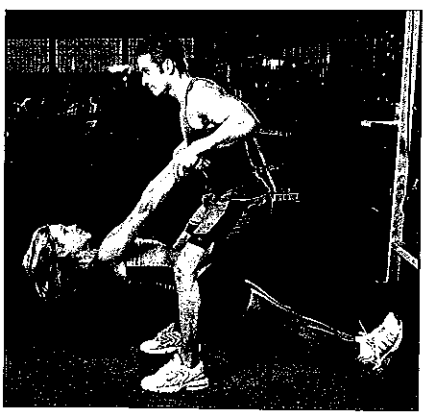


Figure 4.16 Body rows.

vertical bench—This device is composed of a long, vertical, padded bench that is attached to a metal platform that has handles and armrests. The lifter suspends the body by supporting the weight with the forearms and pressing the back against the pad. This bench is used for leg raises (see figure 4.17). Some vertical benches have dip bars extended off the front.

back extension bench—A high, short, padded bench that has leg pads set at the same height as the bench. This allows the lifter to lie prone with the pelvis resting on the padded bench and the feet secured under the leg pads while doing back extensions.

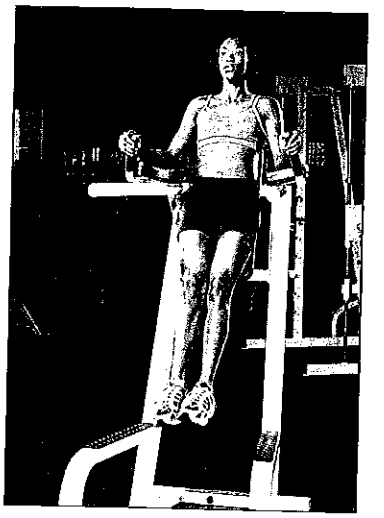


Figure 4.17 Knee raises on a vertical bench.

Simple Weight Machines

Simple weight machines are those machines and apparatuses that provide a constant level of resistance throughout the entire range of motion. These devices include linear guided machines and cable pulley machines. They contain a weight that must be moved. The lifter directly moves the weight along its guide rods or through a cable pulley system.

Linear Guided Machines

Linear guided machines consist of an apparatus that rides on two guide rods. This limits the movement to a linear, or straight, movement. These types of machines usually require the addition of weight plates for added resistance.

Smith machine—A type of machine that consists of a barbell that rides along two vertical rods that serve as guides. The bars permit the barbell to move only in a vertical direction, but they have safety catches at several points from the bottom of the machine to the top to allow the user to start or stop the exercise at any point. This machine is typically used just for exercises that require vertical pushing or pulling, such as the squat, bench press, and row (see figure 4.18).

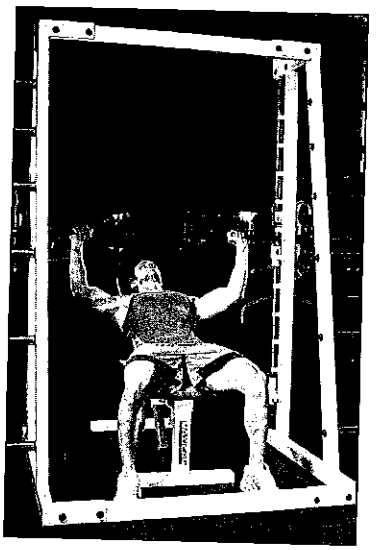


Figure 4.18 Incline bench press on a Smith machine.

leg press—This machine consists of a sled that rides along two rods that are angled at approximately 45 degrees. There is a seat for a lifter to sit in while placing the feet on the sled. After the lifter disengages the safety bar, the sled is free to move up and down the linear guide rod. However, the natural arc of motion of the legs in that position is curvilinear (a combination of a curve and a straight line). This has prompted some manufacturers of weight machines to design leg press machines that follow a curvilinear path. This more natural motion places less stress on the knees.

hack squat—This machine for leg exercises is similar to the leg press except that the lifter stands rather than sits (see figure 4.19). A padded sled rides along two guide rods that are angled at about 50 to 80 degrees. The lifter stands in the hack squat with the back against the padded sled and the shoulders under the shoulder pads. After disengaging the safety bars, the lifter squats down and back up, allowing the sled to follow.

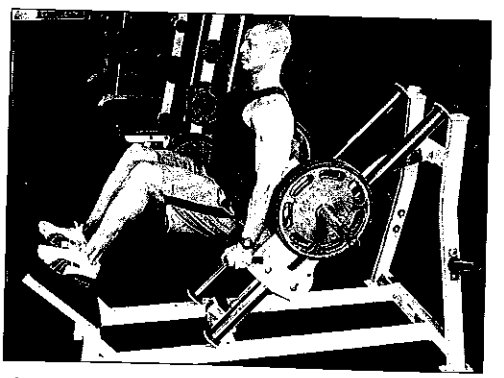


Figure 4.19 The hack squat.

Cable Pulley Machines

Cable pulley machines refer to exercise machines that are based on a simple system of cables and pulleys. In their most basic form they consist of a cable that routes through a pulley (or several pulleys) and connects to a weight stack. A pulley is a freely rotating wheel used to change the direction of force applied by a cable. This allows for force to be applied to a muscle in a variety of directions, such as horizontal. A weight stack is a stack of specialized weight plates (usually rectangular in shape and weighing 10 to 20 pounds each) that are fixed so that they can slide vertically on the guide rods of a weight machine. Each weight plate is drilled with a horizontal hole that allows a pin to be placed through the plate. This weight and all those above it may then be lifted by the moveable rod, which is typically attached to a cable or lever arm. When tension is placed on the cable (that is, the cable is pulled), the weight stack is lifted along its guide rods, thereby supplying resistance. Some home machines, such as Bowflex, use flexible rods for resistance instead of a weight stack. Cables offer a number of benefits to weightlifters. Because the cable can be pulled in a number of directions, it offers constant tension on the muscle throughout the entire range of motion (see figure 4.20).

Figure 4.20 The cable crossover.

cable attachments—A handle must be attached to the end of the cable in order for a cable machine to be used. A variety of cable attachments are used for a variety of exercises:

carabiner—This clip mechanism allows for easy attachment of bars to the cable (see figure 4.21).

lat bar—Primarily used when training the latissimus dorsi and other back muscles on the pulldown machine. The most common lat bar is a long shaft that bends down on both sides (see figure 4.22).

parallel-arm lat bar—This bar has handles on the end that are perpendicular to the bar and allow a neutral grip to be maintained during pulldowns and cable rows (see figure 4.22).

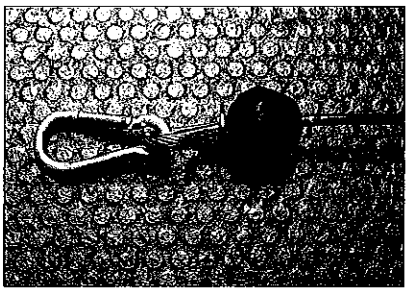


Figure 4.21 A carabiner attached to a cable.

EZ bar—The EZ bar attachment is shaped similar to the EZ curl bar: a stretched-out W (see figure 4.23). Most have a rotating sleeve that allows the bar to swivel to reduce the stress placed on the wrists. This bar is typically used for cable biceps curls and triceps pressdowns.

short straight bar—This bar attachment is similar to an Olympic bar in shape but is much shorter in length (about 20 inches or 51 centimeters). Most have a rotating sleeve. This bar can be used for a variety of exercises, including triceps pressdowns, curls, reverse curls, and upright rows (see figure 4.23).

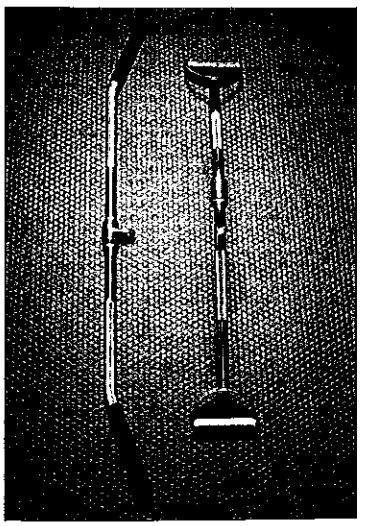


Figure 4.22 Lat bar and parallel-arm lat bar.

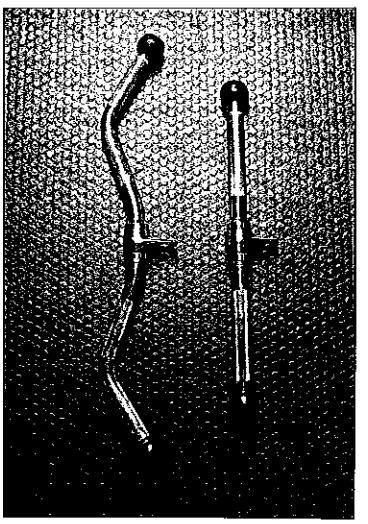


Figure 4.23 EZ bar and short straight bar attachments.

low row bar—This attachment has two short parallel handles connected to two triangle-shaped bars (see figure 4.24). It is used primarily for cable rows and close-grip pulldowns.

long multiple-use V-bar—This bar looks like an upside-down V, with long handles for gripping projecting out to the sides. Because of its design, this bar may relieve some of the load on the wrists during heavy triceps pressdowns. Rows and pulldowns are other exercises that can be performed with the V-bar.

single-handle D-grip—This handle looks like a stirrup with a swiveling handle to grasp (see figure 4.25). It is designed for unilateral cable exercises such as lateral raises, rows, curls, and triceps pressdowns.

pressdown bar—This bar looks like an inverted V or U and is used primarily for triceps pressdowns.

rope—As the name implies, this attachment is literally a thick rope with a metal sleeve where it attaches to the cable (see figure 4.26). This attachment can be used for performing various cable exercises such as triceps pressdowns, hammer curls, and cable crunches.

ankle collar—A wide ankle bracelet that clips to pulleys to allow leg exercises to be performed with cables, such as leg lifts and leg curls (see figure 4.27).

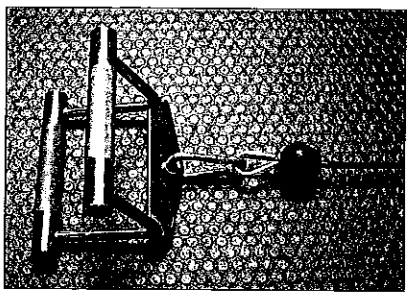


Figure 4.24 Low row bar.

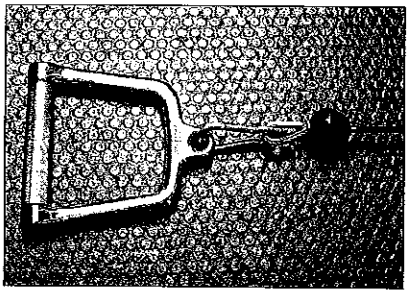


Figure 4.25 Single-handle D-grip.

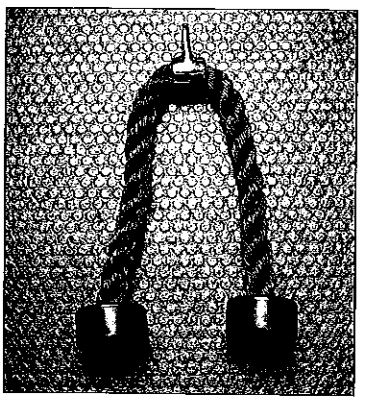


Figure 4.26 Rope attachment.

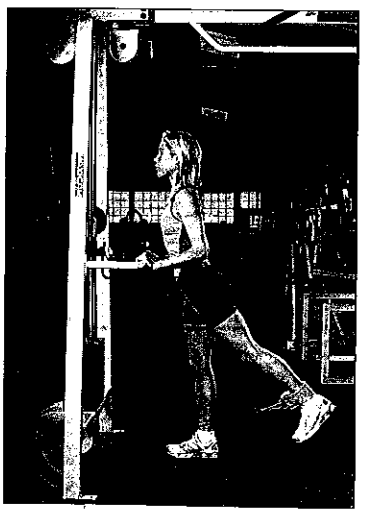


Figure 4.27 Leg raises with an ankle collar attachment.

VARIABLE RESISTANCE

This category of strength training equipment provides variable resistance, whether controlled or not. It includes machines that purposely vary the resistance throughout the range of motion and equipment that varies the resistance throughout the range of motion in an uncontrolled fashion.

Cam-Based Resistance Machines

Cam-based resistance machines are the type of weight machines found in most gyms. They are often called *selectorized machines* because of the weight stack that is on most of these machines. However, some cam-based machines are plate loaded. The most popular brands are Cybex, Body Masters, Maxicam, Nautilus, and Paramount.

The cam is an ellipse connected to the movement arm of the machine on which the cable or belt travels. The purpose of the cam is to provide variable resistance, which changes how heavy the weight feels (but the actual weight never changes) as the lifter moves through the range of motion of the exercise. The reason the perception of the weight needs to change is that each joint movement has an associated strength curve. That is, at different angles of the joint the strength of the agonist muscle varies. For example, during a biceps curl, the strength of the agonist muscles (mainly the biceps) progressively gets stronger up to about 90 degrees of bend at the elbow. After that, the strength progressively decreases as the curl continues. This is known as an ascending and descending strength curve.

There are three types of strength curves and, therefore, three basic cam shapes that correspond to each strength curve:

ascending and descending curve—This type of strength curve was described previously with the biceps curl as an example. In this type of curve the strength increases up to about the halfway point of the movement and then decreases through the rest of the movement. For this reason it is often referred to as bell shaped. The shape of the ascending and descending cam is similar to a bell or an inverted U with the largest radius in the middle (see figure 4.28*a*).

ascending curve—In the ascending curve the strength progressively increases through the entire range of motion. An example of this is the bench press. The farther the weight moves away from the chest, the stronger the agonist muscles are. The shape of the ascending cam is oblong with the largest radius at the distal end (see figure 4.28*b*).

descending curve—In the descending curve the strength progressively decreases through the entire range of motion. This type of strength curve can be experienced during the row exercise. As the handles are pulled closer to the body, the strength of the agonist muscles decreases. The shape of the descending cam is oblong with the largest radius at the proximal end (see figure 4.28*c*).

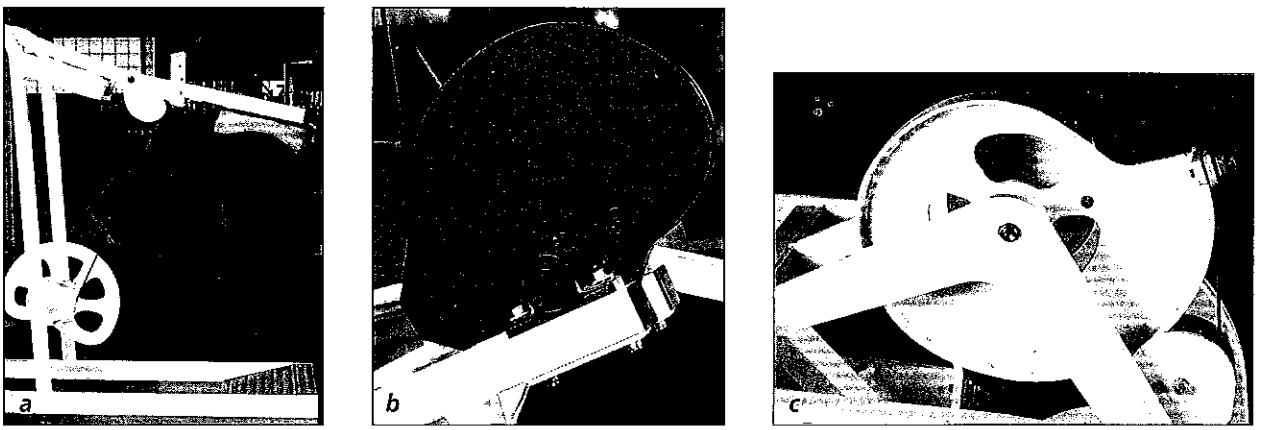


Figure 4.28 Types of cam machines: *(a)* ascending and descending cam, *(b)* ascending cam, and *(c)* descending cam.

Lever-Arm Resistance Machines

Lever-arm resistance machines use counterbalanced lever arms to mimic the strength curves of the muscles being trained. Therefore, much like cam-based machines, the counterbalanced lever arms vary the resistance throughout the range of motion by altering the amount of weight that counterbalances the weight being moved. These are usually plate-loaded machines; however, some of them use a weight stack system. The most popular line of lever-arm resistance machines is Hammer Strength by Life Fitness (see figure 4.29).

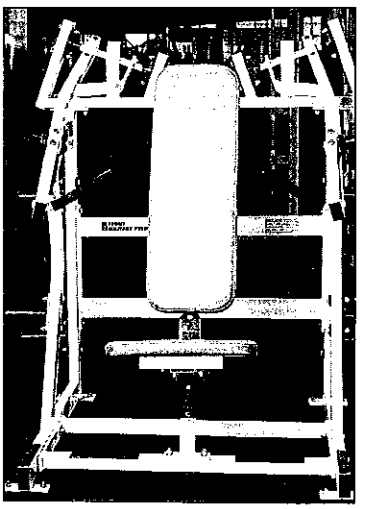


Figure 4.29 A Hammer Strength chest press.

Resistance With Pull

Some exercise devices don't rely on mass for resistance but on the energy their material supplies. Springs, bands, and other material that resist being pulled are such devices. These devices provide only ascending resistance, because the resistance progressively increases over the range of motion.

Springs

The force generated by a spring is a restoring force, which attempts to move the two attachment points back to their original resting positions when they are either pulled farther apart or pushed closer together. The force a spring supplies depends on its material and the diameter of its coils. The distance the spring is pulled or compressed also changes the force, because the farther the ends are moved away from their original position, the more force they will supply. This is known as the spring rate—the rate at which tension increases as the ends move. This characteristic makes it impossible to maintain a particular resistance level over the movement of the exercise. As the spring is deflected, resistance goes up; as it is relaxed, resistance goes down. Because of spring rate, users are forced to select a resistance that will be within their strength capability at maximum deflection, or they won't be able to do the exercise movement at all. As a result, during the first 50 percent or more of the movement, resistance is often too low to produce much benefit. Spring-resistance exercise devices come in a variety of setups. These include simple handheld devices that were popular in the 1950s, such as the Bull Worker, Chest Expander, and Grip Master (see figure 4.30). Although strength training has progressed far beyond spring resistance, some spring devices are still being used in certain products such as hand grippers (see figure 4.31), Pilates exercise machines, and the Stamina Gyrotonics spring-resistance exercise machine.

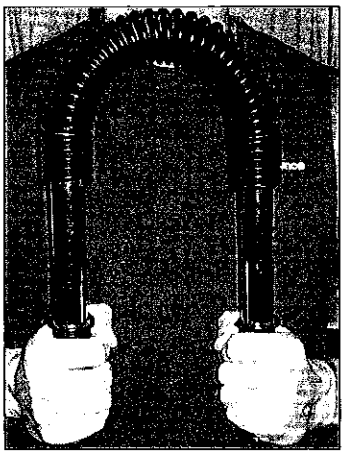


Figure 4.30 Bull Worker.

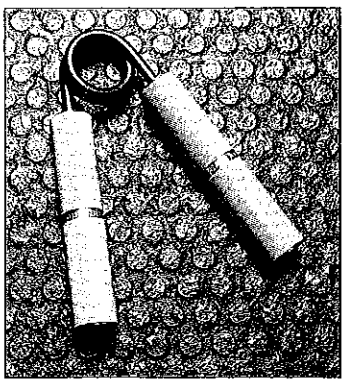


Figure 4.31 Hand gripper.

Elastic Bands and Tubing

Elastic bands and tubing supply a restoring force similar to that of springs. However, the force is applied only when the ends of the material are being pulled away from one another. Like springs, elastic bands and tubing have a spring rate. That is, as they are lengthened, the resistance they provide increases (see figure 4.32). Because they are lightweight and portable, bands and tubing allow exercisers to work out at home or while away from home. Bands and tubes are color coded to represent a certain resistance level. See table 4.1 for color and resistance codes. Although bands and tubing come in a variety of resistance levels, they ultimately allow for a limited amount of strength gain because the amount of resistance they provide is not as great or broad as that of other strength training equipment.

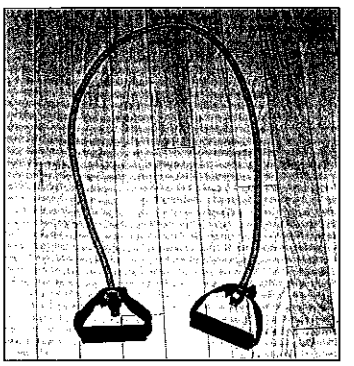


Figure 4.32 Elastic bands.

Table 4.1 Tube and Band Resistance

Band/ tube color	Resistance level	User recommendations
Yellow	Extra light	Youth and those with little or no exercise activity.
Green	Light	Some exercise experience.
Red	Medium	Advanced beginners and those who regularly exercise. Starting size for most men.
Blue	Heavy	More advanced exercisers; good for training large muscle groups.
Black	Extra heavy	Highly trained with correct form and technique.

Resistance levels are measured at 100 percent elongation and twice the unstretched length. They should not be stretched beyond this point.

SPEED MACHINES

This category of strength training equipment deals with machines that control the rate of speed of movement. The type of muscle contraction where the speed remains constant is considered isokinetic. Equipment that controls the speed of movement provides resistance simply by moving through a range of motion at a particular set speed while the lifter applies as much force as possible to the lever arm without altering the speed at which the lever arm moves. Because the lever arm must be moved at a controlled, constant rate, the machines that provide this type of resistance—known as isokinetic dynamometers—are controlled by a computer.

isokinetic dynamometer—This computerized resistance machine can be programmed to move at a variety of set speeds. These are commonly found only in laboratory settings or sports medicine clinics as a tool for measuring the amount of force that an athlete can apply. This type of equipment is usually interfaced with a computer to not only control the rate of speed of the movement but to measure force applied as well. There are several disadvantages of isokinetic dynamometers. The first is the fact that the only motion they permit is angular. In other words, they permit only flexion or extension at the elbow, wrist, knee, or ankle. They cannot be used for pressing exercises, such as the bench press, shoulder press, or squat. The other disadvantage of isokinetic dynamometers is that no isokinetic muscle actions actually occur in real-life movements.

NONTRADITIONAL AND NEW APPARATUS

The last category of strength training equipment covers equipment that is typically not categorized among the other more common forms of strength training equipment. These devices include vibration machines, electronic and computerized resistance machines, pneumatic resistance machines, hydraulic resistance machines, and the Bodyblade. Common to them all is the fact that the way they provide resistance is novel.

Vibration Machines

Whole-body vibration machines usually consist of a device that the user can stand, lie, sit, or place the hands or any other part of the body on to transmit vibration to the body tissues the user wishes to stimulate (see figure 4.33). Most of these vibration machines are about the size of a typical stair stepper, and the vibration platform is about 32 inches by 20 inches (81 by 51 centimeters). The control panel allows the user to change the speed (or frequency) and the magnitude of the vibration.

Most machines have vibration plates that move up and down and side to side, while others work as a high-speed wobble board. The energy from the mechanical vibration (of the plate) is transferred through the body, causing the muscle fibers to contract and relax at an extremely rapid rate and with very high force. Research shows that performing vibration training for several weeks can increase muscle strength and power (Issurin and Tenenbaum 1999) as well as increase the release of growth hormone and testosterone, which are anabolic hormones (Bosco et al. 2000). Although most people cannot understand how vibration can be considered a method of strength training, it is slowly being recognized for its ability to increase strength, power, and possibly muscle growth.

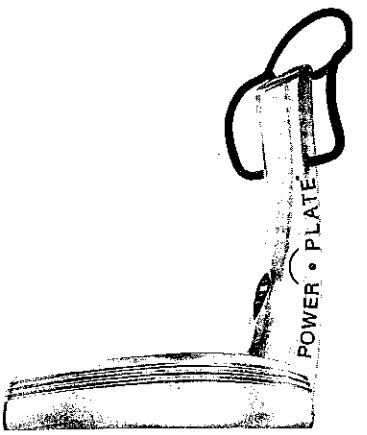


Figure 4.33 Vibration machine.

Electronic and Computerized Resistance Machines

Electronic and computerized machines provide resistance through gears and belts connected to a motor. These are programmed to provide variable resistance throughout the range of motion to follow the strength curve of the muscle being trained. Resistance can be increased in increments as small as one pound through a touch screen, button, or foot pedal. Some machines can be programmed to provide greater resistance during the eccentric portion of the exercise.

Pneumatic Resistance Machines

Pneumatic resistance machines use a compressor to supply air pressure for resistance. This allows the lifter to adjust the resistance on his or her own throughout the range of motion (see figure 4.34). The benefit of this is that as the muscles fatigue during a set, the resistance can be reduced to allow more reps to be completed.

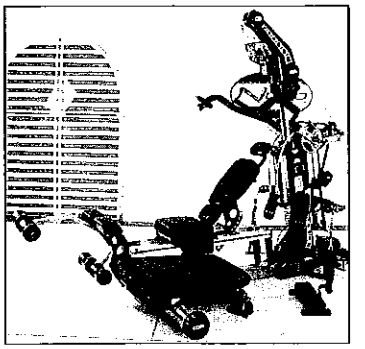


Figure 4.34 Pneumatic machine.

Both electronic and pneumatic machines work in one plane, so the user's motion is predefined. Electronic and pneumatic machines can be less intimidating and safer for beginning exercisers because weight stacks aren't visible and plates do not have to be loaded. Some exercisers do not like electronic or pneumatic equipment, however, because they don't provide the feel of lifting an actual weight stack, dumbbell, or barbell. These modalities also can be more expensive than other strength training equipment, and they require special wiring for electricity or a layout to accommodate an air compressor and hoses.

Because of their uniqueness and ability to suit any population, electronic and pneumatic machines can be an excellent investment and provide variety in strength training for all exercisers.

Hydraulic Resistance Machines

Hydraulic resistance machines provide resistance through hydraulics. The lever arm on these machines is connected to a hydraulic piston that provides resistance against the oil-filled chamber it resides in. The problem with hydraulic resistance machines is that they allow for concentric contractions only. Therefore, most hydraulic machines train dual muscles but only through the concentric portion. For instance, the hydraulic biceps machine is a biceps–triceps machine because after the user curls the weight up, he or she must press it back down using the triceps muscles.

Bodyblade

Bodyblade, shown in figure 4.35, is a five-foot-long fiberglass beam that resembles a snow ski and works by the laws of inertia (an object set in motion remains in motion until another force acts on it to stop or change its direction). The user holds the middle of it and pushes and pulls on the apparatus to start it oscillating. During use, it oscillates at an average rate of about 270 times per minute. These oscillations in the ends of the blade create a force that the holder must resist to literally keep it from flying out of the hands. With each oscillation the muscles of the arms and core must resist the movement by contracting. The greater the amplitude of the blade ends (the farther they flex up and down), the more force the user must apply to resist the movement. By varying the positions of the body or direction of the flexing blade, the user can target

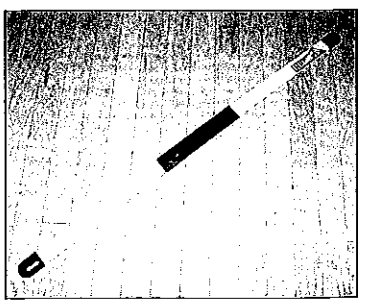


Figure 4.35 Bodyblade.

specific muscle groups throughout the body. Since the blade can be used at any angle and position, a major benefit to this piece of equipment is that it can mimic the movements in a particular sport and provide the required specificity of training. The disadvantage of the Bodyblade is the fact that it is limited mainly to upper-body and core exercises with little application for the lower-body muscles.

SUMMARY

Strength training equipment has developed over the decades from simple free weights to complex machinery that provide resistance through novel mechanisms. This, however, is not to say that the more modern equipment is better than the simplest form of free weights. In fact, free weights have many advantages and very few disadvantages. Modern resistance machines, on the other hand, tend to have many more disadvantages than free weight equipment. Because all forms of strength training equipment offer different advantages and are limited by different disadvantages, it is best to use a variety of training equipment in your strength training program.

PART II

Training for Muscle Mass

Muscle growth—known scientifically as muscle hypertrophy—involves a complex integration of multiple factors. Strength training initiates many of these factors through both the mechanical stress and the metabolic stress that it places on the muscle fibers. The mechanical stress is the actual physical weight the muscle fibers must resist by contracting. This damages muscle fibers and initiates a biochemical cascade that leads to growth of muscle fibers. The metabolic stress comes from the energy demands placed on the muscle to fuel muscle contractions. This type of stress initiates biochemical cascades that influence growth of muscle fiber through various mechanisms. Although the details of many of these biochemical cascades are well defined, it is currently unknown exactly how all these factors work together to result in muscle growth. Yet, through both trial and error and scientific investigation, we do know what training techniques and programs work best to influence the factors that are responsible for causing muscle growth. These techniques and programs are presented in part II.

Chapter 5 covers the basics of creating strength training programs for maximizing muscle growth. This chapter teaches you how to organize your workouts for the week based on your training experience and schedule. It presents guidelines for designing workouts that are effective at producing gains in muscle mass. In addition, it breaks down training into exercises for each major muscle group to allow maximal growth of each.

Chapter 6 introduces you to more advanced training strategies that you can add to the training foundations in chapter 5. These techniques are designed to exaggerate the mechanical stresses and metabolic stresses that are placed on the muscle fibers to encourage muscle growth. These are strategies that are critical to the advanced lifter because the advanced lifter's muscle fibers are better able to handle the stress of strength training.

Chapter 7 concludes this section with long-term training cycles that are designed for beginning, intermediate, and advanced lifters. In addition, training cycles are designed for specific overall goals as well as for emphasizing the growth of specific muscle groups. Whether you're a beginner or an advanced weightlifter, if your current goal is to build more muscle, in part II you will discover all you need to know to realize that goal.

CHAPTER 5

Tactics for Building Muscle Mass

Regardless of whether your goal is to maximize muscle mass or strength gains, knowing how to develop an individualized training program that delivers results is critical to your pursuit. While advanced training techniques—like those described in chapter 6—can help you rapidly advance muscle gains, you must first understand how to organize a basic training program. This chapter demonstrates how to put together a basic yet highly effective program that you can build on later with more advanced training methods as you progress.

If your primary goal is to build muscle mass, then you must consider several things when structuring your strength training program. You will need to consider the variables discussed in chapter 2. These include the choice of exercises you will perform, the order of those exercises, how many sets of each exercise you will do, how heavy a weight you will use on those exercises, and how much rest you will allow between sets. You will also need to consider how often you will train each muscle group, how you will split up your training, and how you will periodize (or cycle) your training for optimal results.

WEEKLY SPLITS

Most weightlifters break their training down into a weekly period. While this isn't a necessity, it seems to be the simplest approach to split up training days because our calendar revolves around a weekly schedule. All other activities in our lives—school, work, television programs, and leisure activities—all follow a weekly schedule. It's only logical to break your strength training down into a similar period. How you split your training will influence how often you train each muscle group per week. Choosing a training split that is the most advantageous for you depends on several factors, such as your training experience, your overall goals, your schedule, and even convenience.

The following seven training splits are the most common and effective for the majority of bodybuilders. These splits start with the easiest (whole-body training) split for beginners (those with less than six months of consistent strength training) and progressively become more intense as they advance through push–pull training splits and two-day training splits, which are ideal for intermediate lifters (those with less than one year of consistent strength training) and end with five-day training splits and twice-a-day training splits, which are geared for the advanced lifter (those with over a year of consistent strength training). Choosing the right split will depend primarily on your training experience, but you should also take into consideration your schedule.

Whole-Body Training

Whole-body training refers to single workouts that stress every major muscle group. In other words, the entire body is trained in every workout. Because you will need to train up to 11 major muscle groups (chest, shoulders, back, quadriceps, hamstrings, biceps, triceps, forearms, trapezius, calves, and abdominals) in each workout, the number of exercises and sets you can do per muscle group is minimal. This allows you to train each muscle group more frequently because it receives a limited amount of stress at

each workout. Typically, most whole-body training workouts use one or two exercises per muscle group, and total sets per muscle group rarely exceed six. Compare this to the four-day and five-day training splits, which allow the weightlifter to hit three to six exercises and a total of 12 to 30 sets per muscle group. The fewer total sets a muscle group receives, the less recuperation it usually needs before being trained again.

Whole-body training splits allow you to train each muscle group about three times per week. This type of training split is best for beginning weightlifters (those with up to six months of training experience), those who want to train each muscle group more frequently, and those who are interested in cutting down on body fat. The reason whole-body training is the best choice for beginners is that the initial adaptations made in a strength training program involve the nervous system. That is, in the first few months of strength training, the primary improvements are seen in the motor units (the nerve fibers that serve the muscle cells). These improvements allow the muscles to contract more efficiently and are best trained by repetition. This means that the best way for beginners to train is with high repetitions and more frequent training to program the nervous system. They should use the same exercises in each workout to maximize the learning effect that will have the greatest benefit on the nervous system.

Whole-body training is effective for building muscle mass for two reasons. The first benefit is known as the staircase effect. Training each muscle group every other day (or about three days per week) allows you to build onto the effects of the previous workout. If you wait too long between workouts, you're back to square one—almost as if you are starting over from the original point. Some experts believe that the staircase effect is critical to muscle adaptation. The second benefit to whole-body training is that it stimulates a large portion of the body's muscle mass. This leads to higher production of growth hormone and testosterone (important for stimulating muscle growth) than workouts that train fewer muscle groups. If you are an advanced weightlifter, the best way to use whole-body training is to mix up the exercises at every workout. This allows you to hit each muscle group from a variety of angles for better stimulation of the majority of muscle fibers within each muscle group.

When it comes to shedding body fat, no workout split is more conducive to that goal than whole-body training. Training all the major muscle groups revs up cellular processes in all the muscle cells, which increases the metabolic rate for up to 48 hours after the workout is over. This means you will burn more calories while sitting around doing nothing. See tables 5.1 and 5.2 for beginner and advanced whole-body training splits.

Table 5.1 Beginner Whole-Body Training Split

Exercise	Sets	Reps
Incline barbell bench press	3	8-10
Dumbbell row	3	8-10
Barbell shoulder press	3	10-12
Leg press	3	8-10
Triceps pressdown	3	8-10
Standing dumbbell curl	3	10-12
Standing calf raise	3	12-15
Crunch	3	15-20

Upper- and Lower-Body Training

Upper- and lower-body training is a training split that simply breaks the body down into upper-body (chest, back, shoulders, trapezius, biceps, triceps) and lower-body (quadriceps, hamstrings, calves, and often abdominals to limit the volume of work done in upper-body workouts). This allows you to train each muscle group two or three times per week depending on whether your schedule allows for four or six days of training each week. The four-day-per-week schedule is a good advancement for the beginner who is progressing from whole-body training. The advantage of upper- and lower-body training over whole-body training is that you can do more volume for each muscle group with upper- and lower-body training. Because you train fewer muscle groups each workout, you have the time to do more exercises and total sets for each muscle group. This means you can train each muscle group more intensely than with whole-body training. However, this means the muscles will require more rest on an

Table 5.2 Advanced Whole-Body Training Split

MONDAY		
Exercise	Sets	Reps
Bench press	4	8-10
Pulldown	4	8-10
Lateral raise	4	10-12
Squat	4	8-10
Barbell curl	4	8-10
Triceps extension	4	10-12
Seated calf raise	4	12-15
Crunch	4	15-20
WEDNESDAY		
Barbell row	4	8-10
Barbell shoulder press	4	8-10
Incline fly	4	10-12
Leg extension	3	10-12
Lying leg curl	3	10-12
Lying triceps extension	4	8-10
Incline dumbbell curl	4	10-12
Standing calf raise	4	10-12
Reverse crunch	4	12-15
FRIDAY		
Incline dumbbell press	4	8-10
Dumbbell row	4	8-10
Upright row	4	10-12
Leg press	4	8-10
Preacher curl	4	8-10
Close-grip bench press	4	8-10
Leg press calf raise	4	15-20
Hanging leg raise	4	10-12

upper- and lower-body training split. For this reason most bodybuilders using this split train four days per week, as shown in table 5.3. This allows for two or three days of rest for each muscle group between workouts and allows for different exercises to be done for each muscle group on the separate workouts.

Table 5.3 Upper- and Lower-Body Training Split

UPPER BODY (MONDAY)			
Muscle group	Exercise	Sets	Reps
Chest	Incline bench press	3	6-8
	Dumbbell fly	3	8-10
Back	Pull-up	3	6-8
	Dumbbell row	3	8-10
Shoulders	Dumbbell shoulder press	3	6-8
	Lateral raise	3	10-12
Trapezius	Smith machine shrug	3	6-10
Biceps	Barbell curl	3	8-10
	Preacher curl	2	10-12
Triceps	Close-grip bench press	3	8-10
	Triceps pressdown	2	10-12
LOWER BODY (TUESDAY)			
Quadriceps	Leg press	3	6-8
	Leg extension	3	10-12
Hamstrings	Seated leg curl	3	10-12
Calves	Leg press calf raise	3	15-20
	Seated calf raise	3	15-20
Abdominals	Hanging leg raise	3	10-12
	Crunch	3	15-20
UPPER BODY (THURSDAY)			
Chest	Dumbbell bench press	3	8-10
	Incline dumbbell fly	3	8-10
Back	Barbell row	3	6-8
	Reverse-grip pulldown	3	8-10
Shoulders	Barbell shoulder press	3	6-8
	Upright row	3	10-12
Trapezius	Dumbbell shrug	3	8-10
Biceps	Incline dumbbell curl	3	8-10
	Cable curl	2	10-12
Triceps	Lying triceps extension	3	8-10
	Triceps dip	2	8-10
LOWER BODY (FRIDAY)			
Quadriceps	Squat	3	6-8
	Dumbbell lunge	3	10-12
Hamstrings	Romanian deadlift	3	8-10
Calves	Seated calf raise	3	15-20
	Standing calf raise	3	15-20
Abdominals	Cable crunch	3	10-12
	Reverse crunch	3	15-20

Two-Day Training Split

The two-day training split is very similar to the upper- and lower-body training split. The minor difference is that some upper-body muscle groups are trained with the legs (see table 5.4). This is because the upper body is composed of more muscle groups than the lower body. Many weightlifters use a scheme similar to the upper- and lower-body training split, but they train biceps and triceps with legs. This splits the two workouts into a workout for the chest, back, shoulder, trapezius, and abdominals and a workout for the quadriceps, hamstrings, calves, biceps, and triceps. The benefits of the two-day training split are the same as for the upper- and lower-body training split. However, the advantage to the two-day training split is that it better balances the number of muscle groups trained for each workout. You can use the two-day training split to train each muscle group either twice a week or three times per week, depending on your schedule and the amount of time you want to allow muscle groups to heal.

Three-Day Training Split

The three-day training split is a common training split used by many bodybuilders to break the major muscle groups into three separate workouts. Although it is not critical how you pair muscle groups, a very common way to break up muscle groups with a three-day split is to separate workouts into a leg day (quadriceps, hamstrings, calves), a push day that trains the muscle groups involved in pushing movements (chest, shoulders, and triceps), and a pull day that trains muscle groups that perform pulling movements (back and biceps). Muscle groups such as abs can be trained on the first and third workout (if training each muscle group once per week) or on the second workout (if training each muscle group twice per week). Dividing the body into three separate workouts allows you to further increase the volume that is typically used in whole-body training and upper- and lower-body training splits. This type of split allows you to give each muscle group three to seven days of rest between workouts. Most bodybuilders using this system train each muscle group either once or twice per week. When training muscle groups just once per week, the typical three-day training split is done

Table 5.4 Two-Day Training Split

Muscle Group	Exercise	Sets	Reps
	MONDAY		
Chest	Decline bench press	3	6-8
	Incline cable fly	3	8-10
Back	Close-grip pulldown	3	8-10
	Smith machine row	3	8-10
Shoulders	Smith machine shoulder press	3	6-8
	Cable lateral raise	3	10-12
Trapezius	Barbell shrug	3	6-8
Abdominals	Hanging leg raise	3	10-12
	Oblique crunch	3	15-20
	TUESDAY		
Quadriceps	Smith machine squat	3	6-10
	One-leg leg extension	3	12-15
Hamstrings	Dumbbell Romanian deadlift	3	8-10
Calves	Donkey calf raise	3	15-20
	Seated calf raise	3	15-20
Biceps	Barbell curl	3	8-10
	Cable concentration curl	2	10-12
Triceps	Seated triceps extension	3	8-10
	Triceps pressdown	2	10-12
	THURSDAY		
Chest	Incline dumbbell press	3	8-10
	Machine fly	3	10-12
Back	Seated cable row	3	8-10
	Wide-grip pulldown	3	8-10
Shoulders	Dumbbell shoulder press	3	8-10
	Barbell front raise	3	10-12
Trapezius	Behind-the-back barbell shrug	3	8-10
Abdominals	Hip thrust	3	15-20
	Exercise-ball crunch	3	15-20
	FRIDAY		
Quadriceps	Leg press	3	6-8
	Dumbbell lunge	3	10-12
Hamstrings	Lying leg curl	3	10-12
Calves	Seated calf raise	3	15-20
	Leg press calf raise	3	15-20
Biceps	Alternating dumbbell curl	3	8-10
	Preacher curl	2	10-12
Triceps	Triceps dip	3	6-10
	Lying triceps extension	2	8-10

on Monday, Wednesday, and Friday, as shown in table 5.5. Although the training doesn't have to take place on these precise three days, it is best to provide one day of rest between workouts. However, if your schedule does not allow for this, it is perfectly fine to train two or even all three of the workouts on consecutive days. This three-day training split is convenient for bodybuilders who train with high intensity or high volume because of the amount of rest allowed. For those interested in training each muscle group twice per week, the three-day training split can be done on Monday, Tuesday, and Wednesday and then repeated Thursday, Friday, and Saturday with a rest day on Sunday. Lower volume should be used for most muscle groups when training this frequently.

Table 5.5 Three-Day Training Split

Muscle group	Exercise	Sets	Reps
	MONDAY		
Chest	Bench press	3	8-10
	Incline dumbbell press	3	8-10
	Cable crossover	3	10-12
Shoulders	Dumbbell shoulder press	3	8-10
	Upright row	3	8-10
	Bent-over lateral raise	3	10-12
Trapezius	Dumbbell shrug	3	6-8
Triceps	Seated triceps extension	3	8-10
	Triceps pressdown (rope)	3	10-12
Abdominals	Hanging leg raise	3	10-12
	WEDNESDAY		
Quadriceps	Squat	3	8-10
	Leg press	3	6-8
	Leg extension	3	10-12
Hamstrings	Lying leg curl	3	10-12
Calves	Standing calf raise	3	10-12
	Seated calf raise	3	12-15
	FRIDAY		
Back	Pull-up	3	6-10
	Barbell row	3	6-8
	Seated cable row (wide grip)	3	8-10
	Straight-arm pressdown	3	10-12
Biceps	Barbell curl	3	8-10
	Preacher curl	3	8-10
Forearms	Wrist curl	3	10-12
Abdominals	Standing cable crunch	3	10-12
	Reverse crunch	3	12-15

Four-Day Training Split

The four-day training split divides all the major muscle groups of the body into four separate training days. This allows you to train fewer muscle groups each workout. By training fewer muscle groups per workout, you can increase the volume and intensity of your workouts. Both of these factors are important for continued progress as your training experience grows. Most four-day training splits are done on a Monday, Tuesday, Thursday, and Friday schedule, and rest days are taken on Wednesday, Saturday, and Sunday. A common way to break up the body's muscle groups is by training chest, triceps, and abdominals on Mondays; quadriceps, hamstrings, and calves on Tuesdays; shoulders, trapezius, and abdominals on Thursdays; and back, biceps, and forearms on Friday, as covered in table 5.6.

The four-day training split pairs larger muscle groups with smaller ones that assist the larger muscle groups, such as chest with triceps. The triceps assist the chest muscles (pectorals) in all pressing exercises such as the bench press. The logic behind this technique is that the chest workout also works the triceps muscles. With this in mind, it makes sense to continue with exercises that further target the triceps. This is the same with pairing back, biceps, and forearms as well as quadriceps, hamstrings, and calves. Along this line of reasoning, you could also pair chest with shoulders and trapezius because the shoulder (deltoid) muscles assist the chest during all exercises that target the chest. The most important rule here is that larger muscle groups are trained before the smaller muscle groups that assist them, because if you train the smaller muscle groups first, they will be fatigued when you are training the larger muscle group and will limit strength on the exercises for the larger muscle group.

Of course, this isn't your only option for pairing muscle groups. On the flip side of pairing muscle groups that work together is the concept of separating muscle groups that work together. The reasoning for this is that the smaller muscle group is often fatigued after training the larger

Table 5.6 Four-Day Training Split for Pairing Like Muscle Groups

Muscle group	Exercise	Sets	Reps
MONDAY			
Chest	Incline bench press	3	8-10
	Dumbbell bench press	3	8-10
	Incline dumbbell fly	3	10-12
	Cable crossover	3	10-12
Triceps	Triceps dip	3	6-10
	Lying triceps extension	3	8-10
	Overhead rope extension	3	10-12
Abdominals	Hanging leg raise	3	10-12
	Crunch	3	15-20
TUESDAY			
Quadriceps	Smith machine squat	4	8-10
	Lunge	3	8-10
	Leg extension	3	10-12
Hamstrings	Lying leg curl	3	10-12
	Romanian deadlift	3	8-10
Calves	Standing calf raise	3	10-12
	Seated calf raise	3	12-15
THURSDAY			
Shoulders	Barbell shoulder press	3	8-10
	Lateral raise	3	10-12
	Front raise	2	10-12
	Standing cable reverse fly	2	10-12
Trapezius	Barbell behind-the-back shrug	4	8-10
Abdominals	Hip thrust	3	12-15
	Cable crunch	3	12-15
FRIDAY			
Back	Wide-grip pulldown to front	3	8-10
	One-arm dumbbell row	3	8-10
	T-bar row	3	8-10
	Reverse-grip pulldown	3	10-12
Biceps	EZ bar curl	3	8-10
	Dumbbell concentration curl	3	10-12
	Alternating hammer curl	3	8-10
Forearms	Dumbbell wrist curl	3	10-12
	Reverse wrist curl	3	10-12

muscle group. This will limit the strength of the smaller muscle group and cause it to fatigue earlier when doing exercises that target it. This in turn can limit growth of that muscle. The option here would be to split up the muscle groups into those that perform opposite actions. For example, on Monday train chest and back; Tuesday train shoulders, trapezius, and abdominals; Thursday train quadriceps, hamstrings, and calves; and Friday train biceps, triceps, forearms, and abdominals, as shown in table 5.7. The Monday and Friday workouts best exemplify this training strategy. Training chest and back allows you to train two muscle groups that don't fatigue each other. The same can be said for training biceps and triceps together. Each muscle group performs an opposite motion of its training pair. The biceps flex the elbow while the triceps extend it. Not only does this help to prevent fatigue of the second muscle group trained, but it can also enhance muscle strength, as explained in chapter 9, with the technique known as *front-to-back training*.

Five-Day Training Split

The five-day split lets you train most muscle groups solo. This means that each workout you can focus on one major muscle group. Training this way lets you radically increase the intensity factor of training and the total volume you perform. This is because each major muscle group is trained when it is rested and at its strongest. A sample five-day training program might be chest on Monday, legs (quadriceps, hamstrings, and calves) on Tuesday, back on Wednesday, shoulders and trapezius on Thursday, and arms (triceps, biceps, and forearms) on Friday. Abdominals can be thrown in on any day such as Monday and Thursday, as shown in table 5.8. This lets you have the weekends off for rest. When you take the rest days is not critical because you could essentially take any two days off during the week. Rest days with this split are more a matter of your schedule. If training on the weekends is not a problem, then train Saturday and Sunday, but take two weekdays off for rest.

Twice-a-Day Training Split

This is a demanding split that offers several advantages for only the most advanced bodybuilders. As the name implies, the twice-a-day training split involves training at two separate

Table 5.7 Four-Day Training Split for Pairing Opposite Muscle Groups

Muscle group	Exercise	Sets	Reps
MONDAY			
Chest	Smith machine bench press	3	8-10
	Incline dumbbell press	3	8-10
	Dumbbell fly	3	10-12
	Pec deck	3	10-12
Back	Pull-up	3	6-10
	Reverse-grip barbell row	3	6-8
	Seated cable row	3	8-10
	Wide-grip pulldown	3	10-12
TUESDAY			
Shoulders	Dumbbell shoulder press	3	8-10
	Smith machine upright row	3	8-10
	One-arm cable lateral raise	3	10-12
	Bent-over lateral raise	3	10-12
Trapezius	Barbell shrug	4	6-8
Abdominals	Incline sit-up	3	12-15
	Oblique crunch	3	12-15
THURSDAY			
Quadriceps	Squat	3	6-8
	Leg press	3	8-10
	Step-up	3	8-10
	Leg extension	3	10-12
Hamstrings	Standing leg curl	3	10-12
Calves	Smith machine calf raise	3	10-12
	Seated calf raise	3	12-15
FRIDAY			
Biceps	Alternating dumbbell curl	3	8-10
	Lying cable curl	3	8-10
	Dumbbell preacher curl	3	8-10
Forearms	Reverse-grip curl	3	10-12
	Behind-the-back wrist curl	3	10-12
Triceps	Close-grip bench press	3	6-10
	Triceps pressdown	3	8-10
	One-arm overhead dumbbell extension	3	10-12
Abdominals	Exercise-ball crunch	3	10-12
	Reverse crunch	3	12-15

Table 5.8 Five-Day Training Split

Muscle group	Exercise	Sets	Reps
MONDAY			
Chest	Smith machine incline press	4	6-10
	Dumbbell bench press	3	8-10
	Decline dumbbell press	3	8-10
	Incline dumbbell fly	3	10-12
	Cable fly	3	10-12
Abdominals	Hanging leg raise	3	12-15
	Oblique crunch	3	12-15
	Cable crunch	3	10-12
TUESDAY			
Quadriceps	Squat	4	6-10
	Hack squat	3	8-10
	Lunge	3	8-10
	Leg extension	3	10-12
Hamstrings	Romanian deadlift	3	8-10
	Lying leg curl	3	10-12
Calves	Standing calf raise	3	10-12
	Donkey calf raise	3	12-15
	Seated calf raise	3	15-20
WEDNESDAY			
Back	Pull-up	3	6-10
	Barbell row	3	6-8
	One-arm dumbbell row	3	8-10
	Reverse-grip pulldown	3	10-12
	Straight-arm pressdown	3	10-12
THURSDAY			
Shoulders	Barbell shoulder press	3	6-8
	Dumbbell shoulder press	3	8-10
	Cable upright row	3	8-10
	Seated dumbbell lateral raise	3	10-12
	Reverse pec deck	3	10-12
Trapezius	Smith machine shrug	3	6-8
	Dumbbell shrug	3	8-10
Abdominals	Reverse crunch	3	12-15
	Standing cable crunch	3	10-12
	V-up	3	12-15
FRIDAY			
Triceps	Lying triceps extension	3	8-10
	Reverse-grip cable pressdown	3	8-10
	Overhead dumbbell extension	3	8-10
	Dumbbell kickback	2	12-15
Biceps	Barbell curl	3	8-10
	EZ bar preacher curl	3	8-10
	Prone incline dumbbell curl	3	8-10
	Seated hammer curl	2	10-12
Forearms	Dumbbell wrist curl	3	10-12
	Dumbbell reverse wrist curl	3	10-12

times a day. Typically, most bodybuilders who train twice a day train one muscle group earlier in the day and one muscle group later in the day. The break between the two training sessions usually is at least six hours. Depending on your goal, this allows you to either train more frequently or get more complete rest days. With twice-a-day training you can train all the major muscle groups of the body in three or four days. This means you can get either three or four days of rest each week if you respond better to training muscle groups once per week. However, if your muscles respond better to more frequent training, then this method allows you to train each muscle group up to twice per week. Another way to use twice-a-day training is to follow a typical five-day training split that incorporates a not-so-typical twist: train the same muscle group twice per day. (See table 5.9.) According to research, this may be a beneficial way to train muscles. See chapter 6 for more details on this training method.

BODY-PART TRAINING

Regardless of what type of split you choose, you need to be informed about the best ways to train each muscle group according to your training split of choice. The training split you use will influence factors such as the number of exercises you perform and the total number of sets you do per muscle group. But generally speaking, your training split does not have to influence the type of exercises you choose, the amount of weight used, the number of reps performed, or the amount of rest you allow between sets. Therefore, there are general rules to consider when designing a strength training program, regardless of the spilt you are employing.

If your goal is to maximize muscle mass, then your most important rule has to deal with the amount of weight used and, hence, the number of reps performed. Generally speaking, if you want to increase muscle size, your rep range should fall in the ballpark of 6 to 12 reps, and the majority of your training should be done in the range of 8 to 10 reps. Heavier-weight workouts have been shown to increase testosterone levels higher than workouts with lighter weight. Testosterone is an important anabolic hormone that initiates the process of muscle growth. However, higher reps, such as 15 to 20, are often used to stimulate muscle growth as well. These higher-repetition workouts are associated with a higher rate of release of growth hormone compared to workouts involv-

Table 5.9 Twice-a-Day Training Split

Muscle group	Exercise	Sets	Reps
	MONDAY (8:00 A.M.)		
Chest	Bench press	3	8-10
	Incline dumbbell bench press	3	8-10
	Incline dumbbell fly	3	10-12
	Cable crossover	3	10-12
	MONDAY (6:00 P.M.)		
Triceps	Triceps dip	3	6-10
	Dumbbell lying triceps extension	3	8-10
	Triceps pressdown	2	10-12
	Overhead dumbbell triceps extension	2	10-12
Abdominals	Hanging leg raise	3	10-12
	Cable crunch	3	10-12
	TUESDAY (8:00 A.M.)		
Quadriceps	Leg press	4	6-8
	Smith machine squat	4	8-10
	Step-up	3	8-10
	One-leg leg extension	4	12-15
	TUESDAY (6:00 P.M.)		
Hamstrings	Romanian deadlift	3	8-10
	Lying leg curl	3	10-12
	Back extension	2	12-15
Calves	Standing calf raise	4	10-12
	Seated calf raise	4	12-15
	THURSDAY (8:00 A.M.)		
Shoulders	Barbell shoulder press	4	8-10
	Dumbbell upright row	3	8-10
	Dumbbell lateral raise	3	10-12
	Bent-over lateral raise	3	10-12
	THURSDAY (6:00 P.M.)		
Trapezius	Smith machine barbell shrug	3	6-8
	Seated dumbbell shrug	3	8-10
Abdominals	Hip thrust	3	12-15
	Exercise-ball crunch	3	12-15
	FRIDAY (8:00 A.M.)		
Back	Wide-grip pulldown to front	4	8-10
	Barbell row	4	8-10
	Close-grip pulldown	3	10-12
	Seated cable row	3	8-10
	FRIDAY (6:00 P.M.)		
Biceps	Barbell curl	3	8-10
	Incline dumbbell curl	3	10-12
	Cable concentration curl	2	10-12
	Dumbbell hammer curl	2	8-10
Forearms	Dumbbell wrist curl	3	10-12
	Reverse wrist curl	3	10-12

ing heavier weight. Because growth hormone is involved in muscle growth, maximizing its release after a workout can be critical. Higher reps also enhance the capillarization of muscle fibers. That is, the amount of blood vessels that supply the muscles increases with higher-repetition training. By increasing the number of blood vessels that supply a muscle fiber, there is an accompanying increase in the delivery of blood to the muscle fibers. Enhancing blood flow to the muscle fibers increases the supply of critical nutrients for energy and growth such as carbohydrate, amino acids from protein, and fat. There also is greater provision of oxygen. Oxygen not only is essential for muscle energy for recovery between sets but is also critical for lessening the muscle damage that follows a weightlifting workout. Another benefit of increased blood flow to muscle fibers is the greater supply of anabolic hormones, such as testosterone and growth hormone, to the muscles.

Another important consideration for building muscle mass is the rest time allowed between sets. Most bodybuilders use shorter rest periods of around one to two minutes. Shorter rest periods—those that are two minutes or less—have also been shown to increase the surge of growth hormone that follows a weightlifting workout. Shorter rest periods also increase the capillarization of the muscles as well as enhance the activity of enzymes that are involved in energy supply to the muscle.

Exercise selection and order of those exercises are other important things to consider for building muscle mass. For larger muscle groups that employ several multijoint exercises, such as the chest, back, shoulders, and legs, do those multijoint exercises early in the workout when the muscle is strongest. Then follow those exercises with isolation exercises that involve movement at one single joint and best isolate the targeted muscle group. The reason for this is that multijoint exercises recruit the help of other muscle groups to perform the exercise. The targeted muscle group of that exercise is considered the primary mover, while the muscle groups that help the primary mover perform the exercise are considered assistance muscles. An example of this is the bench press, a multijoint exercise for the chest. In the bench press, the chest is considered the primary mover while the shoulders, triceps, and even the lats are considered the assistance muscles. Because multijoint exercises involve synergy of several muscle groups, you can lift more weight with multijoint exercises. There is a definite correlation between the amount of weight lifted and the extent of the muscle gains made. It is a good idea to do the exercises that you can lift the most weight with first. This is when all the muscles used in that exercise are freshest and therefore can all help to lift the greatest amount of weight they are capable of lifting.

For gains in strength, the general consensus among experts is that fewer sets tend to be best. But there is some debate over the ideal volume—or total sets—to use for optimizing gains in muscle mass. One reason may be that there is no ideal number of sets for increasing muscle mass. In general, beginners should start out with fewer sets and gradually increase them as their training experience progresses. But when you consider experienced bodybuilders, there are few generalizations that can be made in regard to volume. Some bodybuilders train with very low volume (6 to 10 total sets per muscle group), while others use extremely high volume (20 to 30 total sets per muscle group), as did the most famous bodybuilder of all time, Arnold Schwarzenegger. One bit of advice for

Changing Your Split

No matter the training split that currently is your best fit, you should consider changing your split to offer your body some variety in the way you train it. Just as it is important to change your weight and reps or rest time between sets, altering how you split up your training is another way to maintain continual progress in training adaptations and avoid stagnation. For beginners, starting on a whole-body training split and then slowly progressing to splits that allow more volume to be done for each muscle group is a necessity. See the table for a suggested succession of training splits based on training experience. Start with the split that corresponds to your level of training experience and progress to the next split as you reach a new level of training experience.

Training experience (months)	Optimal training split
1 to 3	Whole-body training split
4 to 9	Upper- and lower-body training split or two-day training split
10 to 18	Three-day training split
19+	Four- or five-day training split

advanced lifters is to cycle training volume from periods of low volume to high volume. This will depend on the training intensity as well as the training frequency.

Just remember that these are general guidelines for building a solid foundation for your training program. Many of the methods you will read about in chapter 6 contradict these guidelines. The reason is that the techniques presented in chapter 6 are techniques for those with moderate to extensive training experience. For experienced lifters, changing the convention from time to time better enables muscle growth because of the radical change in the training program.

Chest

The chest refers to the muscle group known as the pectoralis major. This consists of the upper pectoralis major and lower pectoralis major (see figure 5.1). The pectoralis muscles perform movements such as horizontal adduction of the upper arms, as in the dumbbell fly. For detailed descriptions of chest exercises, refer to chapter 11. Basic, multijoint exercises for the chest involve pressing movements, such as the bench press, incline dumbbell press, and push-up. Isolation exercises for the chest are flylike exercises that involve movement of the arms without any change occurring at the elbow joint. Examples of isolation exercises for the chest include the dumbbell fly, cable crossover, and pec deck. The upper and lower sections of the chest are hit differently by the various chest exercises. Therefore, the first order of importance when it comes to chest training is to ensure that you include exercises that target the upper, middle, and lower pectoralis. Refer to table 5.10 for basic guidelines in designing a chest workout based on the current training split used.

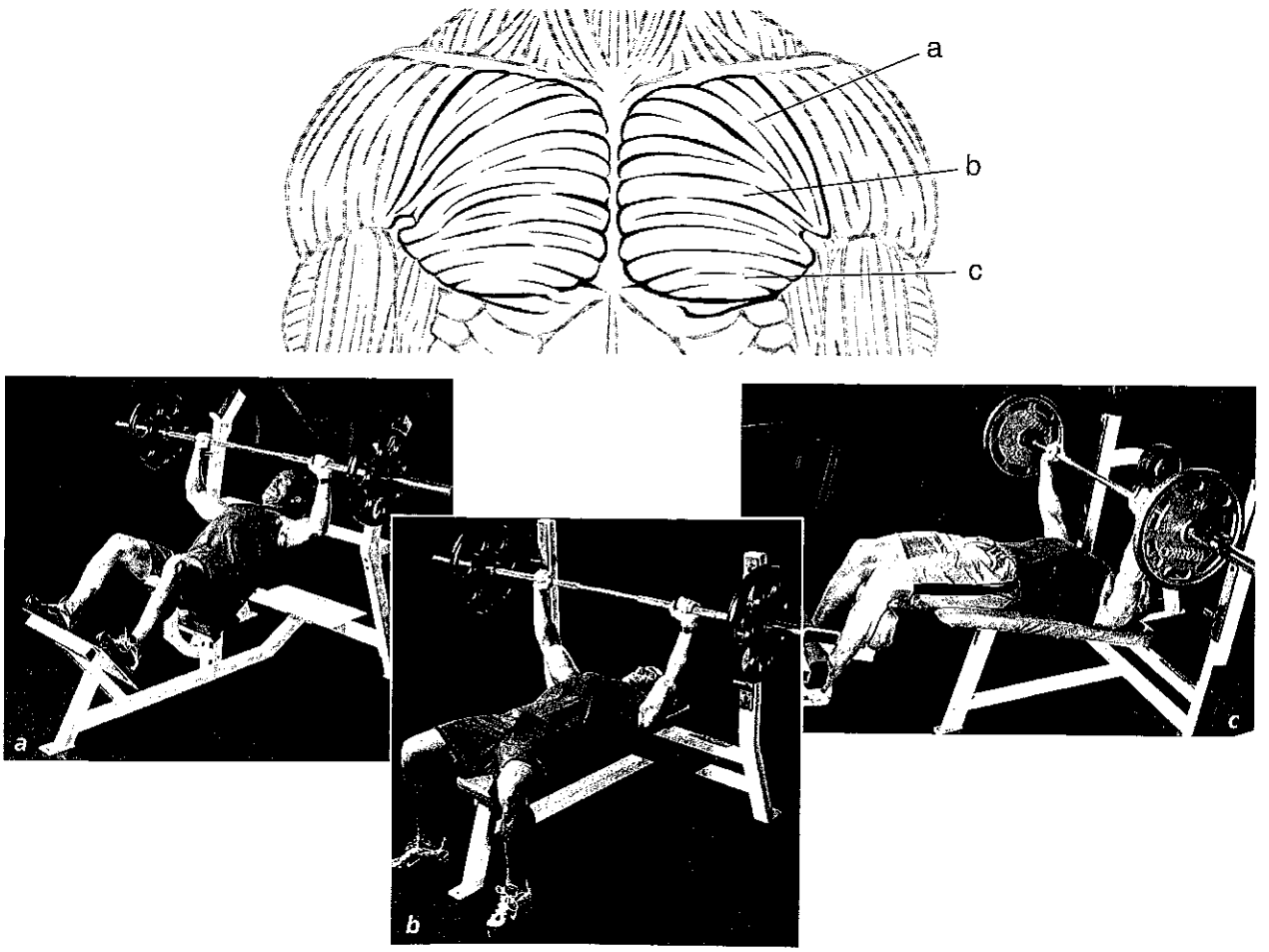


Figure 5.1 Pectoralis muscle: *(a)* the upper pectoralis is targeted by the incline bench press; *(b)* the middle pectoralis is targeted by the flat bench press; and *(c)* the lower pectoralis is targeted by the decline bench press.

Table 5.10 Chest Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Swap pressing exercises and fly-type exercises every other workout. Swap incline- and flat-bench exercises every other workout.	3-6
Upper- and lower-body training split or two-day training split	2	Choose one incline- and one flat-bench exercise every workout. First: A pressing exercise* Second: A fly-type exercise Swap the incline movement from the pressing exercise to the fly-type exercise every other workout. Perform one decline exercise or the cable crossover at least once every other week.	6-8
Three-day training split	3	First: A barbell exercise* Second: A dumbbell press Third: A fly-type exercise Alternate incline and flat benches for the first two exercises every other workout. The third exercise should match the type of incline used for the first. Perform one decline exercise or the cable crossover at least once every other week.	6-12
Four-day training split	4	First: A barbell exercise* Second: A dumbbell press Third: A dumbbell fly exercise Fourth: A machine or cable fly-type exercise Alternate incline and flat benches for the first two exercises every other workout. The third exercise should match the type of incline used for the first. Perform one decline exercise or the cable crossover at least once every other week.	8-16
Five-day training split	4-5	First: A barbell exercise* Second: A barbell or a dumbbell press Third: A dumbbell press exercise if doing five exercises total; if doing only four exercises total, the third should be a dumbbell fly exercise Fourth: A dumbbell, machine, or cable fly-type exercise Fifth: A machine or cable fly-type exercise Alternate incline, flat, and decline benches for the first three exercises every other workout. The fourth exercise should match the type of incline used for the first.	10-20
Twice-a-day training split	4	First: A barbell exercise* Second: A dumbbell press Third: A dumbbell fly exercise Fourth: A machine or cable fly-type exercise Alternate incline and flat benches for the first two exercises every other workout. The third exercise should match the type of incline used for the first. Perform one decline exercise or the cable crossover at least once every other week.	8-16

*Can supplement Smith machine version here.

Shoulders

The shoulders refer to the deltoid muscles found on top of the upper arm. The deltoid is composed of three heads that originate on different points of the shoulder girdle but all converge on one common tendon that inserts on the humerus (upper arm bone). The three heads are the anterior deltoid (front head), the middle deltoid, and the posterior deltoid (rear head). Although these three heads work together to lift the upper arm at the shoulder joint, such as during the lateral raise, each head is stressed differently by different exercises (see figure 5.2). That is why it is important to structure shoulder workouts around basic multijoint movements (such as the overhead press) that hit all three heads as well as isolation exercises (such as front raise for the anterior head, lateral raise or upright row for the middle head, and rear deltoid raise for the posterior head). Refer to chapter 12 for detailed descriptions of all shoulder exercises. See table 5.11 for guidelines for designing a shoulder workout based on the current training split being used.

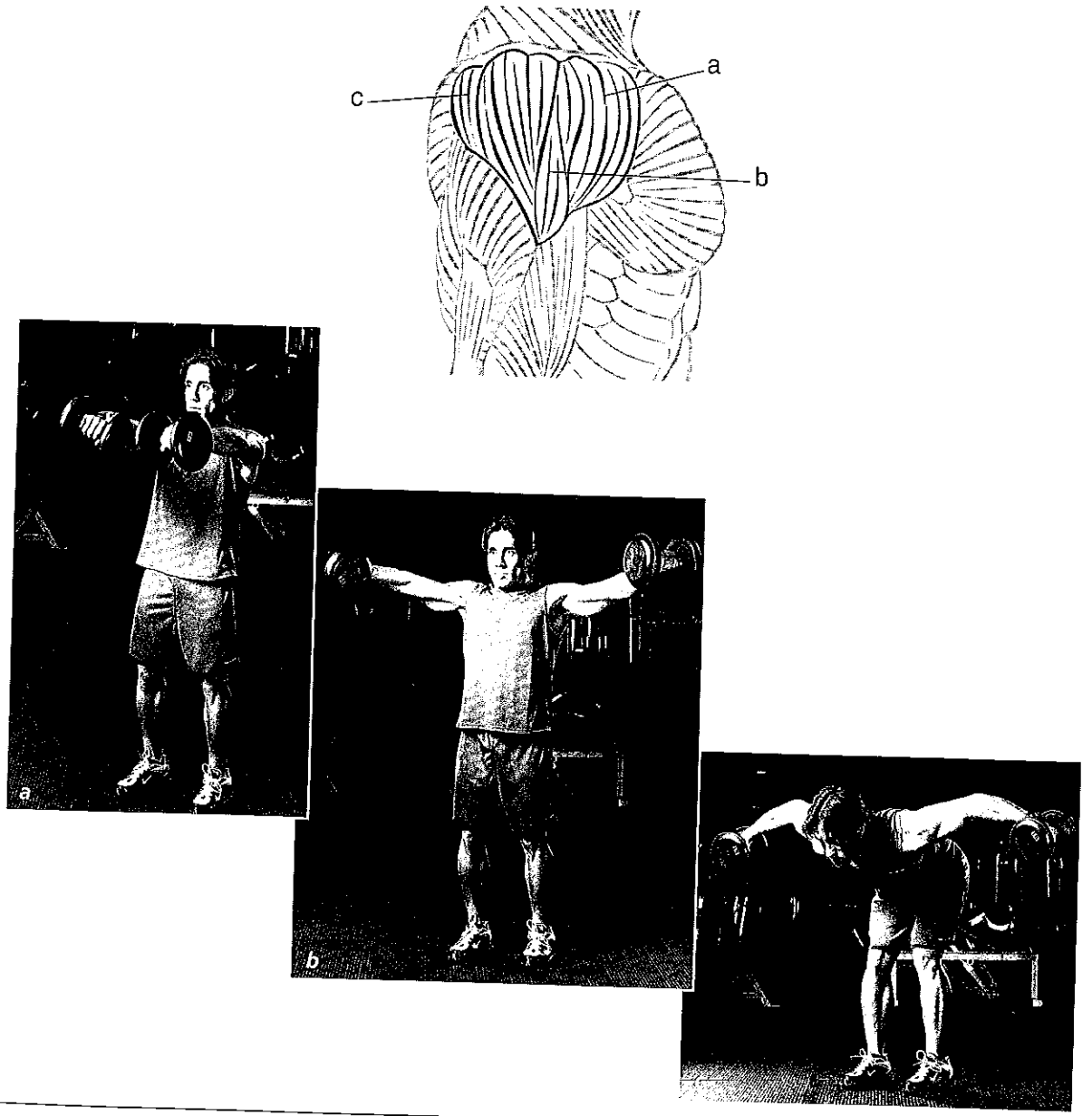


Figure 5.2 Deltoid muscle: *(a)* the anterior head is targeted by the front raise; *(b)* the middle head is targeted by the lateral raise; and *(c)* the posterior head is targeted by the bent-over lateral raise.

Table 5.11 Shoulder Training Guidelines Based on Training Split

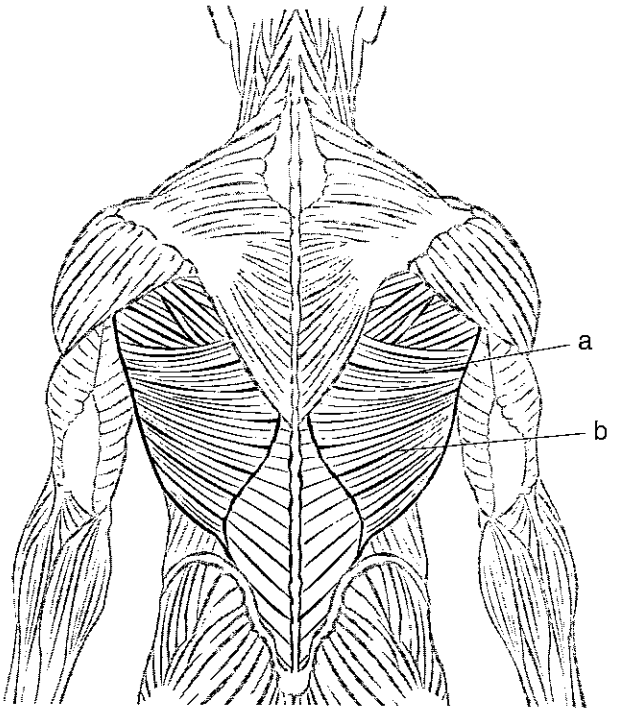
Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Swap pressing exercises and isolation exercises every other workout. Frequently swap between barbell* and dumbbell pressing exercises. Periodically swap upright rows for lateral raises. Try to perform a rear deltoid exercise for the isolation exercise at least once a month.	3-6
Upper- and lower-body training split or two-day training split	2	Choose one pressing exercise and one isolation exercise every workout. First: A pressing exercise Second: An isolation exercise Swap barbell pressing* exercises with dumbbell pressing exercises every other workout. Frequently alternate isolation exercises by switching up on lateral raises, front raises, upright rows, and rear deltoid exercises.	6-8
Three-day training split	3	First: A pressing exercise* Second: A lateral raise or upright row exercise Third: A front raise or a rear deltoid exercise Alternate barbell* and dumbbell presses for the first exercises every other workout. Alternate upright row and lateral raise exercises every other workout. Alternate front raise and rear deltoid exercises every other workout.	6-12
Four-day training split	4	First: A pressing exercise* Second: A lateral raise or upright row exercise Third: A front raise exercise Fourth: A rear deltoid exercise Alternate barbell* and dumbbell presses for the first exercises every other workout. Alternate upright row and lateral raise exercises every other workout.	8-16
Five-day training split	4	First: A pressing exercise* Second: A lateral raise or upright row exercise Third: A front raise exercise Fourth: A rear deltoid exercise Alternate barbell* and dumbbell presses for the first exercises every other workout. Alternate upright row and lateral raise exercises every other workout.	8-16
Twice-a-day training split	4	First: A pressing exercise* Second: A lateral raise or upright row exercise Third: A front raise exercise Fourth: A rear deltoid exercise Alternate barbell* and dumbbell presses for the first exercises every other workout. Alternate upright row and lateral raise exercises every other workout.	8-16

*Can supplement Smith machine version here.

Back

Back refers to the muscles that make up the backside of the torso. Although the term *back* refers mostly to the large latissimus dorsi muscles, or lats, that run from the upper arms all the way down to the buttocks, it can also include the teres major, the rhomboids, and even the middle and lower portions of the trapezius, because these muscles are often involved in performing exercises that are considered back exercises. The two major types of lat exercises are the pulling exercises (which include pull-ups and pulldowns) and rowing exercises (which include bent-over barbell rows, T-bar rows, and seated cable rows). Pull-up and pulldown exercises tend to concentrate more on the upper and outer lats as well as the teres major. Rowing exercises tend to concentrate more on the middle and lower lats as well as the rhomboids and middle trapezius muscles. Other types of lat exercises are the pullover and straight-arm pulldown. For detailed descriptions of all back exercises, refer to chapter 13. See table 5.12 for basic guidelines for designing a back workout based on the current training split used.

The term *back* also refers to the musculature of the low back. The muscles in the lower back are those that support the spinal column and allow it to extend back, such as when you recline in a chair. These are deeper muscle fibers such as the spinal erectors, which include the longissimus thoracis, iliocostalis lumborum, and spinalis thoracis, shown in figure 5.3. Exercises that train the low back are back extension exercises and good mornings.



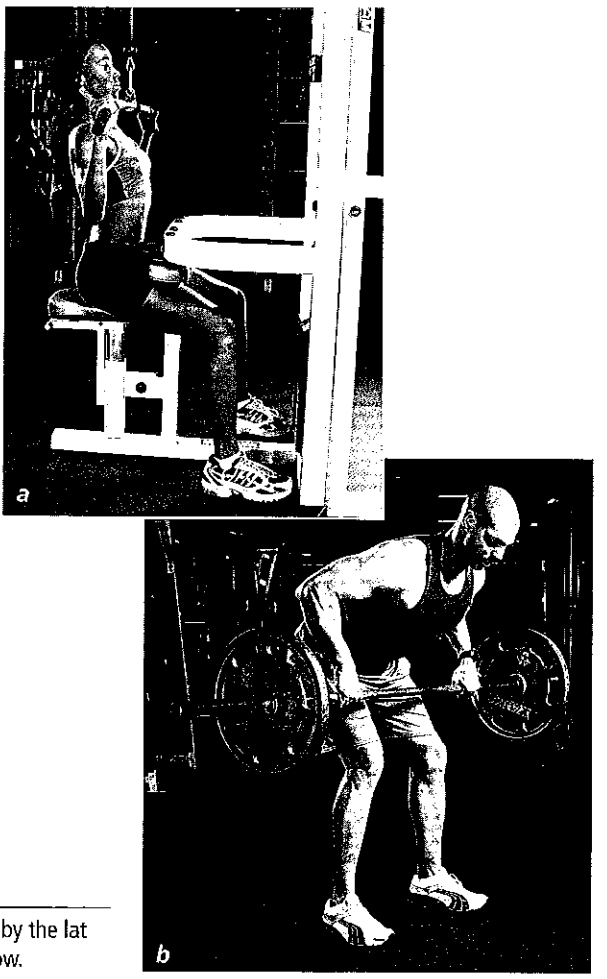


Figure 5.3 Back musculature: *(a)* the upper and outer lats are worked by the lat pulldown, and *(b)* the lower and middle lats are worked by the barbell row.

Table 5.12 Back Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Swap pulling exercises and rowing exercises every other workout. At least once a month include a pullover or straight-arm pulldown exercise. It's also wise to include one low-back exercise once a week.	3-6
Upper- and lower-body training split or two-day training split	2	Choose one pulling and one rowing exercise every workout (swap the order every week). Occasionally replace the pulling exercise with a straight-arm pulldown or pullover exercise. It's also wise to include one low-back exercise once a week.	6-8
Three-day training split	3	Choose one pulling and one rowing exercise as the first two exercises every other workout (swap the order every week). The third exercise should be a straight-arm pulldown or pullover exercise. It's also wise to include one low-back exercise once a week.	6-12
Four-day training split	4	Choose one pulling and one rowing exercise as the first two exercises every other workout (swap the order every week). Third: A pulling or rowing exercise (swap the exercise choice every other week) Fourth: A straight-arm pulldown or pullover exercise It's also wise to include one low-back exercise once a week.	8-16
Five-day training split	4-5	Choose one pulling and one rowing exercise as the first two exercises every other workout (swap the order every week). Third: A pulling or rowing exercise (swap the exercise choice every other week) Fourth: A straight-arm pulldown or pullover exercise Fifth: A low-back exercise	10-20
Twice-a-day training split	4	Choose one pulling and one rowing exercise as the first two exercises every other workout (swap the order every week). Third: A pulling or rowing exercise (swap the exercise choice every other week) Fourth: A straight-arm pulldown or pullover exercise It's also wise to include one low-back exercise once a week.	8-16

Trapezius

The trapezius is the large diamond-shaped muscle on the upper back, often referred to as traps. This muscle has upper, middle, and lower portions that all perform different movements (see figure 5.4). The upper trapezius primarily lifts and rotates the shoulder blades upward as when shrugging the shoulders. The middle trapezius primarily pulls the shoulder blades together. The lower trapezius rotates the shoulder blades downward. Trapezius training can be paired with shoulders or back. Most bodybuilders train the traps after shoulders because their primary interest is in developing the upper portion of the traps. The upper traps are involved in most deltoid exercises. Therefore, they are sufficiently warmed up after training shoulders. Most lifters typically pick one or two exercises for trap workouts and perform three to eight sets. If both a barbell and a dumbbell trap exercise are done in the same workout, the barbell exercise is done first. For detailed descriptions of trapezius exercises, see chapter 14.

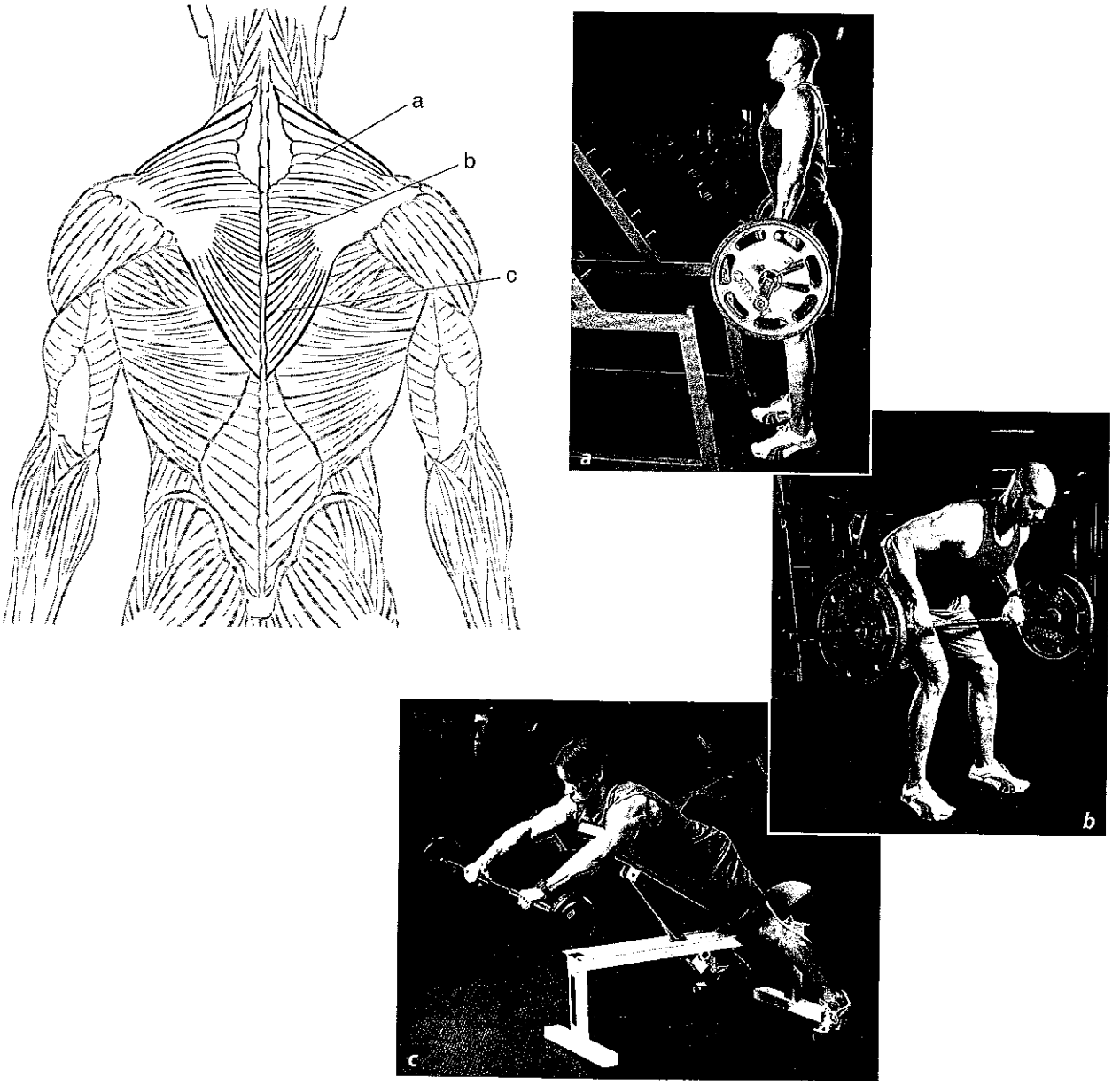
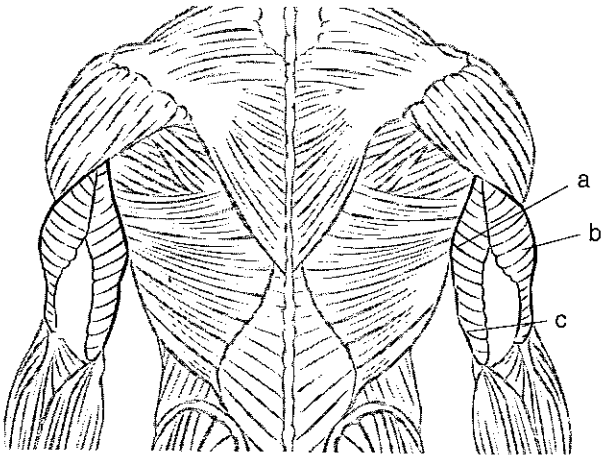


Figure 5.4 Trapezius muscle: *(a)* the upper traps are worked by the barbell shrug; *(b)* the middle traps are worked by the barbell row; and *(c)* the lower traps are worked by the prone front raise.

Triceps

The triceps consist of three muscle heads that are on the back of the upper arm. The three heads of the triceps are the lateral head, long head, and medial head (see figure 5.5). Each head has a distinct attachment on the upper end, but they all meet at one common tendon that crosses the elbow and attaches on the ulna. Contracting the triceps results in extension at the elbow such as the motion the arm makes when hammering.

The two types of triceps exercises are compound movements and isolation movements. Compound triceps exercises involve extension at the elbow and movement at the shoulder. These include close-grip bench presses and dips. Isolation triceps exercises involve just extension at the elbow with no other joint movement, such as dumbbell kickbacks. When choosing triceps exercises, you should include some compound exercises, which are beneficial for adding on overall triceps mass, as well as a good variety of isolation exercises.



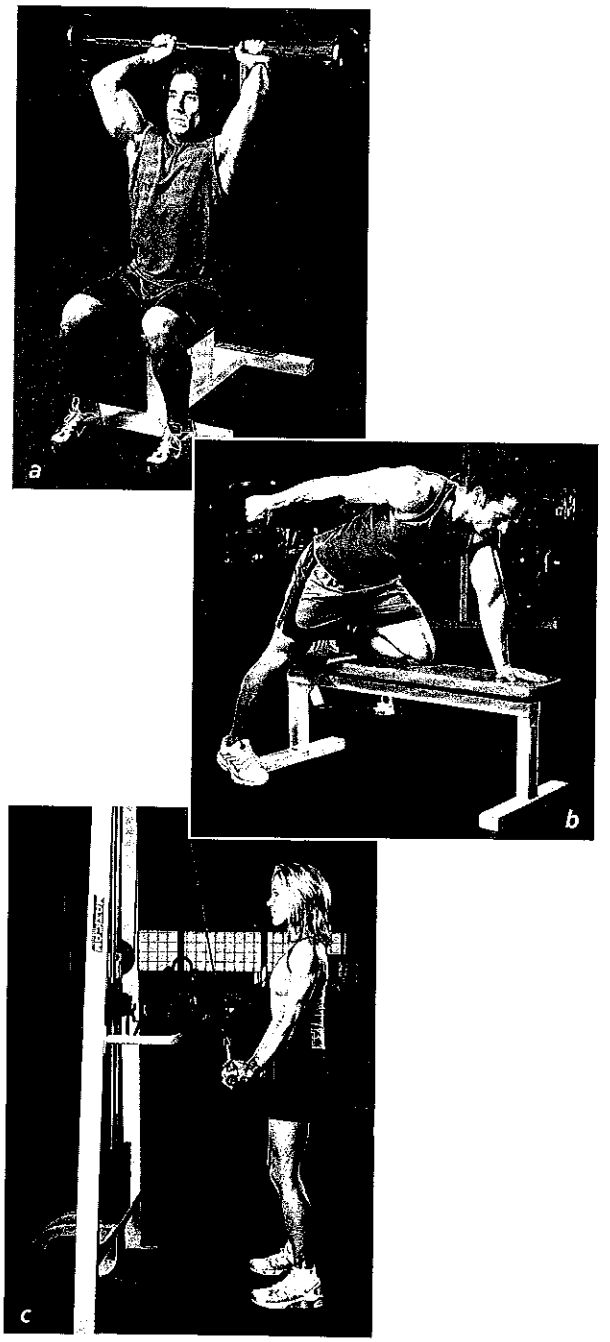


Figure 5.5 Triceps: *(a)* The long head is targeted by the overhead triceps extension; *(b)* the lateral head is targeted by the dumbbell kickback; and *(c)* the medial head is targeted by the reverse-grip cable pressdown.

The isolation exercises you choose should hit the three different triceps heads. While you may not be able to do this in every workout, depending on your split, you should try to rotate your exercise selection from workout to workout to hit the different heads.

Although every triceps exercise hits all three heads to some degree, certain ones are better than others at stressing the different heads because of the biomechanics involved. Because the long head of the triceps attaches to the scapula (shoulder blade), it is more strongly contracted during exercises where the arms are brought overhead or in front of the body. This is because that action stretches the long head. Muscles contract the strongest when they are stretched to their longest length. Therefore, exercises that are done overhead such as overhead extensions (with dumbbells, barbells, or cables) best stress the long head of the triceps. Exercises that place the arms in front of the body, such as lying triceps extensions (with barbells, dumbbells, or cables) also hit the long head to some degree. Extensions that are done with the arms at the sides of the torso while holding a neutral or overhand grip—such as triceps pressdowns and dumbbell kickbacks—best target the lateral triceps head. The same exercises done with an underhand grip seem to stress the medial head. For detailed descriptions of all triceps exercises, go to chapter 15. Refer to table 5.13 for basic guidelines for designing a triceps workout based on the current training split used.

Table 5.13 Triceps Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Swap compound and isolation exercises every other workout. Rotate isolation exercises to target all three triceps heads.	2-4
Upper- and lower-body training split or two-day training split	2	Choose one compound and one isolation exercise every workout. First: A compound exercise (alternate between pressing and dipping exercises every other workout) Second: An isolation exercise (rotate isolation exercises to target all three triceps heads)	4-8
Three-day training split	3	Choose one compound and two isolation exercises every workout. First: A compound exercise (alternate between pressing and dipping exercises every other workout) Second: An overhead or lying extension (alternate between the two every other workout) Third: An extension done with the arms held at the sides (alternate between overhand, neutral, and underhand grips on different workouts)	6-12
Four-day training split	3-4	Choose one compound and two or three isolation exercises every workout. First: A compound exercise (alternate between pressing and dipping exercises every other workout) Second: An overhead or lying extension (alternate between the two every other workout if doing only three exercises) Third: If doing four exercises total, an overhead or lying extension (if the second exercise is an overhead extension the third should be a lying extension, and vice versa); if doing only three exercises total, the third should be an extension with the arms held at the sides Fourth: An extension with the arms held at the sides (alternate between overhand, neutral, and underhand grips on different workouts)	6-16
Five-day training split	3-4	Choose one compound and two or three isolation exercises every workout. First: A compound exercise (alternate between pressing and dipping exercises every other workout) Second: An overhead or lying extension (alternate between the two every other workout if doing only three exercises) Third: If doing four exercises total, an overhead or lying extension (if the second exercise is an overhead extension the third should be a lying extension and vice versa); if doing only three exercises total, the third should be an extension with the arms held at the sides Fourth: An extension with the arms held at the sides (alternate between overhand, neutral, and underhand grips on different workouts)	6-16
Twice-a-day training split	3-4	Choose one compound and two or three isolation exercises every workout. First: A compound exercise (alternate between pressing and dipping exercises every other workout) Second: An overhead or lying extension (alternate between the two every other workout if doing only three exercises) Third: If doing four exercises total, an overhead or lying extension (if the second exercise is an overhead extension, the third should be a lying extension, and vice versa); if doing only three exercises total, the third should be an extension with the arms held at the sides Fourth: An extension with the arms held at the sides (alternate between overhand, neutral, and underhand grips on different workouts)	6-16

Biceps

Biceps refers to two muscle heads that run down the front of the upper arm that are called the biceps brachii (see figure 5.6). The two heads are the long head (or outer head) and the short head (or inner head). The major difference between them is where each muscle attaches on the scapula (shoulder blade). The tendon of the long head attaches farther back on the scapula than the short head. This is why they are referred to as *long head* and *short head*. Both biceps heads converge into one tendon near the elbow, and this attaches to the radius to cause flexion of the elbow when the muscles contract, such as when curling a dumbbell.

To flex the elbow, the biceps brachii receives help from the assistance muscle called the brachialis. This muscle lies underneath the biceps muscles and starts at the humerus (upper arm bone) and attaches to the ulna. The bulk of this muscle is lower than the bulk of the biceps muscle, which allows it to offer the most help during the first 30 degrees of elbow flexion. The brachialis is also strongly involved in elbow flexion when the hands maintain an overhand grip on the bar. The brachioradialis, although considered a forearm muscle, also helps at the initiation of elbow flexion. It is strongly involved in elbow flexion when the hand is in a neutral position, such as during hammer curls.

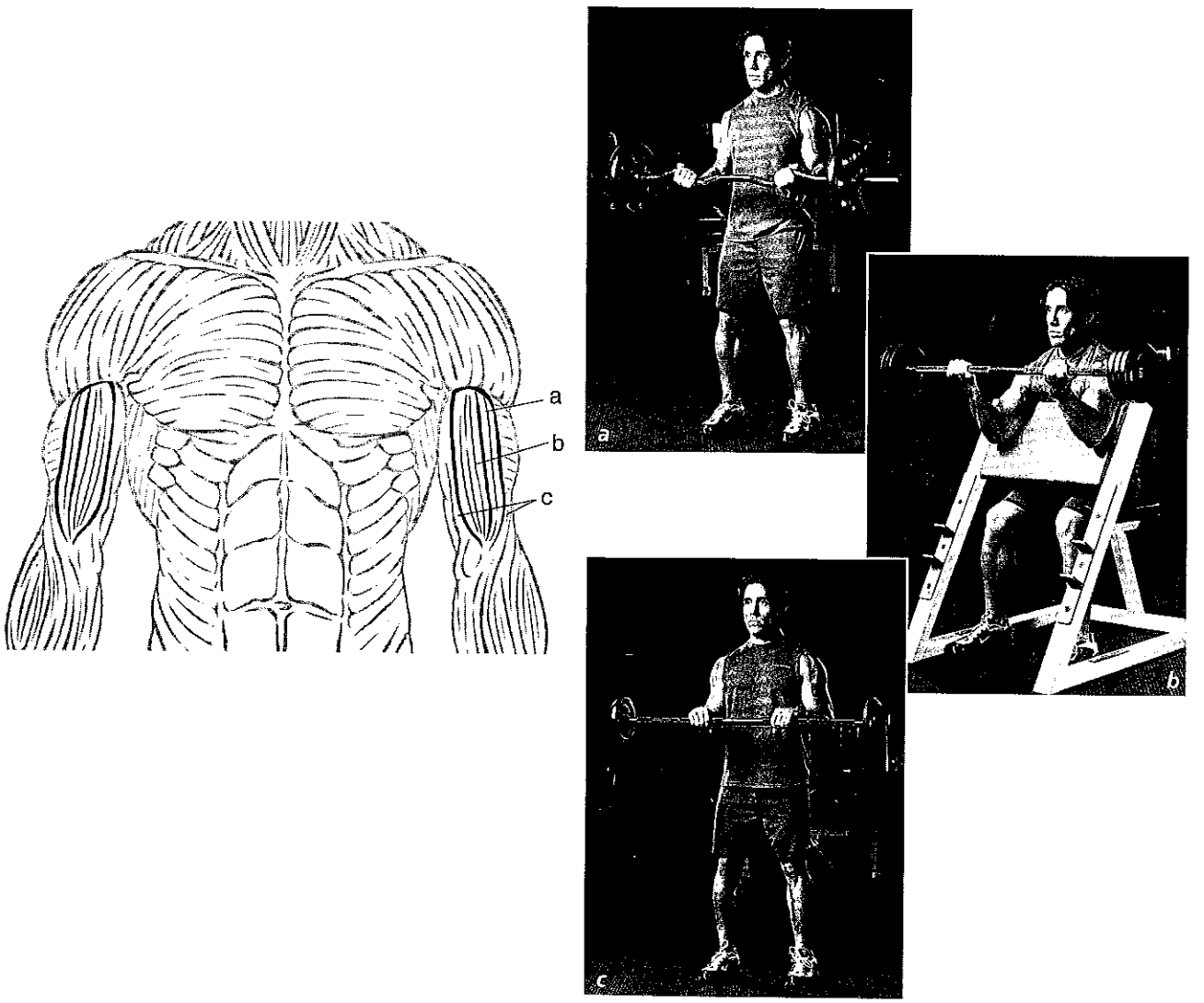


Figure 5.6 Biceps: *(a)* the long head is targeted by the EZ bar curl; *(b)* the short head is targeted by the preacher curl; and *(c)* the brachialis, located beneath the biceps, is targeted by the reverse curl.

With the exception of underhand chin-ups, there are no compound exercises for biceps. Even the underhand chin-up is considered a back exercise. Therefore, almost all biceps exercises are isolation exercises. However, the exercises you choose should stress the different biceps heads as well as the brachialis, which helps to make the biceps appear larger (particularly the lower portion) when it is properly developed. For detailed descriptions of all biceps exercises, refer to chapter 16. For basic guidelines for designing biceps workouts based on the current training split used, see table 5.14. Most exercise choices for the biceps workout should be underhand (supinated) grip curls, such as barbell curls, dumbbell curls, and preacher curls. With barbell curls you should frequently change your grip to stress the heads differently. Doing curls with a closer grip (hip width or closer) puts more stress on the long head of the biceps—the part of the biceps that is responsible for the peak that is seen when a bodybuilder flexes the biceps. Also consider alternating between using a straight barbell and an EZ curl bar. The EZ curl bar places the hands halfway between an underhand and a neutral grip. This places greater emphasis on the long head of the biceps. Therefore, doing hammer curls (using a neutral grip) with dumbbells or a rope attachment emphasizes the long head of the biceps in addition to the brachialis and brachioradialis (forearm muscle on the thumb side of the forearm) muscles. Another exercise that hits the brachialis and brachioradialis and, to a lesser extent, the biceps is reverse-grip curls with a pronated grip. One other way to place greater emphasis on the long head is by doing dumbbell curls while sitting back on an incline between 30 and 60 degrees. This position stretches the long head of the biceps to put it in its strongest position for contraction.

To emphasize the short head, you can do the opposite of the incline curl and do curls on a preacher bench. This places the arms in front of the body, which shortens the long head and reduces its contraction strength. Other ways to stress the short head are to do curls with a wider grip (shoulder width and wider) or to perform supination during dumbbell curls. Supination requires the movement of the hand from a neutral position to an underhand position while curling. The order in which you stagger your biceps exercises is not as critical as involving a variety of movements that emphasize both biceps heads as well as the brachialis.

Since the brachioradialis and other forearm muscles are involved in assisting most biceps exercises, it is wise to train the forearms after the biceps. Doing hammer curls and reverse-grip curls at the end of your biceps workout is a smart way to segue from a biceps workout into a forearm workout. These exercises involve the brachialis and biceps as well as the brachioradialis muscle.

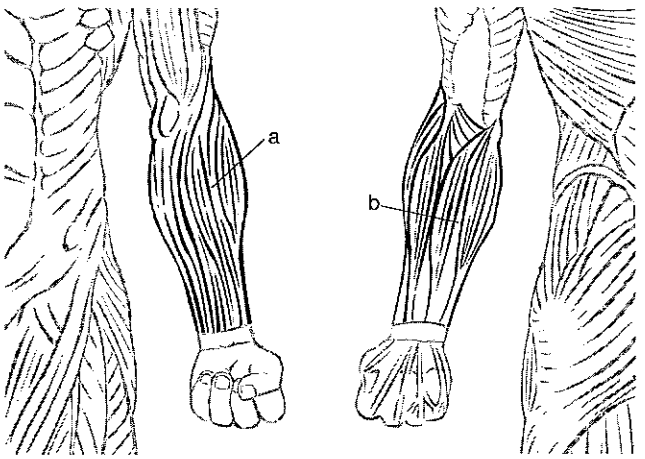
Table 5.14 Biceps Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	The majority of exercise choices should be basic underhand curls. Frequently alter the type of curl from workout to workout to hit each biceps head differently as well as the brachialis.	2-4
Upper- and lower-body training split or two-day training split	2	First: A basic underhand curl (alternate every workout for variety) Second: Should target the long head or the short head (alternate between long-head and short-head exercises) Periodically swap the second exercise with a brachialis exercise.	4-8
Three-day training split	3	First: A basic underhand curl (alternate every workout for variety) Second: Should target the long head or the short head (alternate every workout between long-head and short-head exercises) Third: A brachialis exercise.	6-12
Four-day training split	3-4	First: A basic underhand curl (alternate every workout for variety) Second: Should target the long head or the short head (if doing only three exercises total, alternate every workout between long-head and short-head exercises) Third: If doing four exercises total, an exercise that stresses the long head or short head (opposite of what the second exercise stressed); if doing three exercises total, the third should target the brachialis Fourth: A brachialis exercise	6-16
Five-day training split	3-4	First: A basic underhand curl (alternate every workout for variety) Second: Should target the long head or the short head (if doing only three exercises total, alternate every workout between long-head and short-head exercises) Third: If doing four exercises total, an exercise that stresses the long head or short head (opposite of what the second exercise stressed); if doing three exercises total, the third should target the brachialis Fourth: A brachialis exercise	6-16
Twice-a-day training split	3-4	First: A basic underhand curl (alternate every workout for variety) Second: Should target the long head or the short head (if doing only three exercises total, alternate every workout between long-head and short-head exercises) Third: If doing four exercises total, an exercise that stresses the long head or short head (opposite of what the second exercise stressed); if doing three exercises total, the third should target the brachialis Fourth: A brachialis exercise	6-16

Forearms

The forearms are the muscles that make up the entire lower arm. Though you do not need to familiarize yourself with all the different forearm muscles shown in figure 5.7, you should recognize the difference in those referred to as the wrist flexor group and those referred to as the wrist extensor group. The wrist flexor group is composed of forearm muscles that perform wrist flexion—the movement of the palms toward the inner forearm, such as during a wrist curl. The wrist extensors, on the other hand, are involved in performing wrist extension—moving the back of the hand toward the back of the forearm, such as when you twist the throttle on a motorcycle.

It is wise to train the forearms after the biceps because they are used so strongly during all biceps exercises. Typically, choosing one wrist curl (flexion) exercise and one reverse wrist curl (extension) exercise is sufficient for working the forearm muscles after biceps, especially if reverse-grip or hammer-grip curls were performed. If grip strength is a limiting factor on back and biceps exercises, including a specific grip exercise may be warranted. The grip exercise should be done before the wrist curl and reverse wrist curl exercises. For a complete listing and detailed descriptions of all forearm exercises, see chapter 17. If training with a whole-body, upper- and lower-body, or two-day split, you may consider skipping specific forearm work and relying on the fact that the forearm muscles are used during back and biceps exercises. For basic guidelines for designing forearm workouts based on the current training split used, see table 5.15.



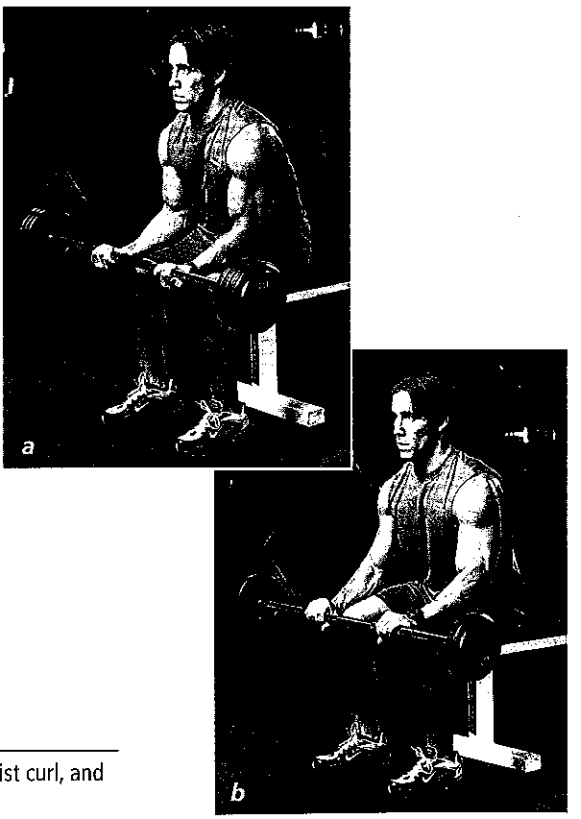


Figure 5.7 Forearm muscles: *(a)* the flexor muscles are worked by the wrist curl, and *(b)* the extensor muscles are worked by the reverse wrist curl.

Table 5.15 Forearm Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Alternate wrist curl exercises and reverse wrist curl exercises every other workout.	2-4
Upper- and lower-body training split or two-day training split	1	Alternate wrist curl exercises and reverse wrist curl exercises every other workout.	2-4
Three-day training split	2	Choose one wrist curl and one reverse wrist curl exercise every workout; alternate the order every other workout. Frequently change the type of wrist curl and reverse wrist curl exercises.	4-8
Four-day training split	2	Choose one wrist curl and one reverse wrist curl exercise every workout; alternate the order every other workout. Frequently change the type of wrist curl and reverse wrist curl exercises.	4-8
Five-day training split	2	Choose one wrist curl and one reverse wrist curl exercise every workout; alternate the order every other workout. Frequently change the type of wrist curl and reverse wrist curl exercises.	4-8
Twice-a-day training split	2	Choose one wrist curl and one reverse wrist curl exercise every workout; alternate the order every other workout. Frequently change the type of wrist curl and reverse wrist curl exercises.	4-8

Quadriceps

The quadriceps are the four muscles that make up the front of the thigh. The vastus lateralis, vastus medialis, vastus intermedius, and rectus femoris all originate from different attachment points on the thigh and hip bone, but they all converge on one common tendon to perform knee extension, such as when you kick a ball (see figure 5.8). Because the rectus femoris originates on the hipbone, not the femur (thigh bone) as with the other three quadriceps muscles, it also is involved in hip flexion, such as when you lift your knee up. Although all four muscles work together to straighten the knee, certain exercises are better for targeting specific parts of the quad. For instance, the leg extension best targets the rectus femoris muscle. However, doing leg extensions with the toes turned in places more stress on the outer quad (rectus lateralis), and doing leg extensions with the toes pointed out better targets the inner quads (rectus medialis). The leg press hits all four quad muscles, but research shows that the emphasis is on the medialis muscle. Conversely, the hack squat tends to place more emphasis on the outer quads (vastus lateralis). Squats and lunges, however, hit the four quadriceps muscles fairly evenly, along with the leg adductors, hamstrings, gluteus maximus, and other muscles. For detailed descriptions of all quadriceps exercises, see chapter 18.

For maximizing leg size, you should start your quadriceps workout with one or two squat exercises (with barbells, Smith machine, or dumbbells) or leg press exercises, depending on the type of split you are training with. These exercises are compound exercises that involve extension at the knees and hips. Therefore, they use not only the quadriceps muscles but also the hamstring and gluteus maximus muscles (powerful hip extensors). Because these large muscle groups work together to perform the exercise, they provide great strength. This is the reason that these exercises should be at the beginning of your leg workout. You should train these muscles when they are at their strongest so that the greatest amount of weight can be used for stimulating the most muscle growth.

With the squat and leg press exercises you should routinely alter your foot position to slightly change the specific muscle fibers that are used during the exercise. Although squats hit all four quadriceps muscles pretty equally, slightly greater emphasis can be directed to certain muscles by changing the distance the feet are spaced apart. For instance, squats done with the feet close together place slightly more emphasis on the outer quads than squats done with the feet shoulder-width apart. Conversely, when squats are done with the feet spaced much wider than shoulder width, greater emphasis is placed on the inner quad and adductor muscles. Squats done on a Smith machine or on a squat machine allow you to change not only the width of your feet but also the distance they are out in front of your hips. For these exercises the same rules apply in regard to how wide the feet are spaced apart. It also is possible to reduce the emphasis on the quadriceps and increase the emphasis on the hamstrings and gluteus maximus by moving the feet farther forward from the hips. The farther the feet are placed in front of the hips, the greater the stress placed on the hamstrings and gluteus maximus and the less stress the quadriceps receive.

The leg press, on the other hand, reduces the amount of stress placed on the hamstrings and gluteus maximus and maximizes the stress placed on the quadriceps; the majority of stress hits the vastus medialis muscle. This is due to the seated position of the angled leg press. The seated position keeps the hips flexed at about 90 degrees when the legs are fully extended. Since the hamstrings and gluteus maximus are involved in extension of the hips during compound leg movements, their involvement is minimized on the leg press. Still, it is possible to increase the stress on these muscles by shifting the feet higher up on the platform and thus farther in front of the hips. As with the other exercises, the wider the feet are spaced apart on the foot plate of the leg press, the greater the involvement of the vastus medialis and adductors.

It's optimal to include some form of lunging or stepping exercises to train the legs unilaterally. Because these exercises are compound movements done one leg at a time, they require a

lot of stabilization from small and large muscle groups. That means they use most of the leg muscles including the quads, hamstrings, glutes, and adductor and abductor muscles. Not only do these types of exercises help develop overall size of the thigh muscles, but they also build functional strength, which transfers to more strength on other exercises, such as squats.

The only type of isolation exercise for quadriceps is leg extension exercises, where the only movement that occurs is extension at the knee. This focuses a good deal of the stress on the rectus femoris muscle, although you can encourage more involvement from the vastus lateralis or vastus medialis by altering the position of the feet, as described previously. You should perform leg extension exercises at the end of the quadriceps workout after you perform the more demanding compound exercises. However, some bodybuilders prefer to warm up their quads before heavy compound exercises by doing several light sets of leg extensions. For basic guidelines for designing quadriceps workouts based on the current training split used, see table 5.16.

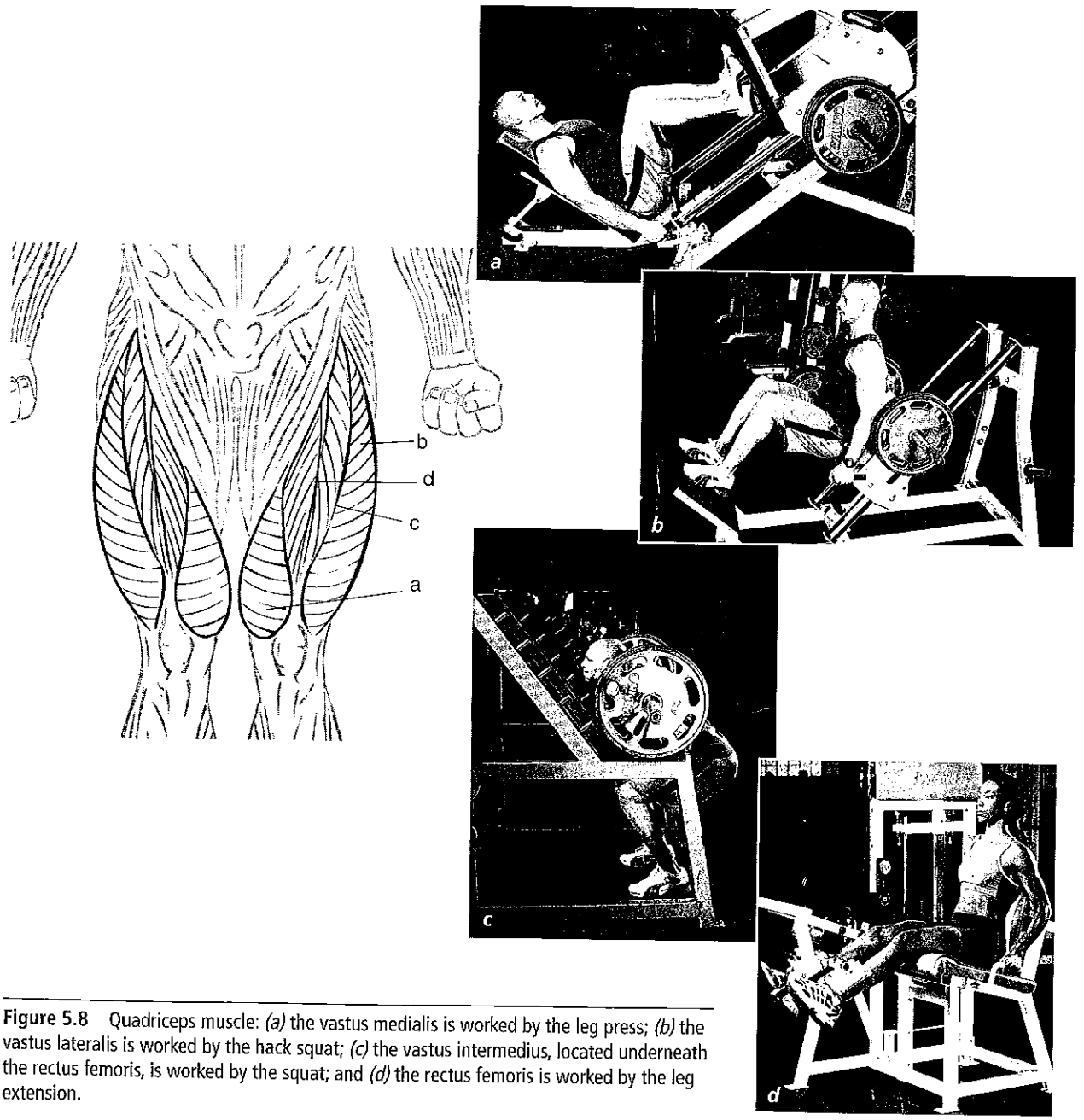


Figure 5.8 Quadriceps muscle: *(a)* the vastus medialis is worked by the leg press; *(b)* the vastus lateralis is worked by the hack squat; *(c)* the vastus intermedius, located underneath the rectus femoris, is worked by the squat; and *(d)* the rectus femoris is worked by the leg extension.

Table 5.16 Quadriceps Training Guidelines Based on Training Split

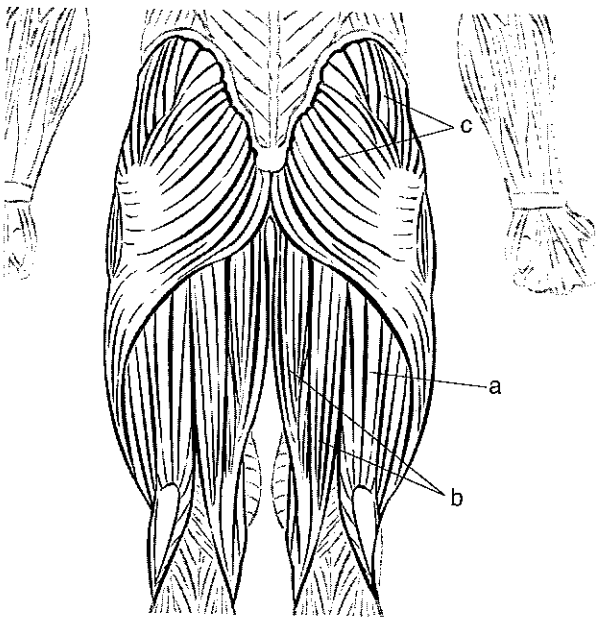
Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Swap squat exercises, leg press or machine squat exercises, lunge or step exercises, and leg extension exercises each workout.	3-6
Upper- and lower-body training split or two-day training split	2	Choose one compound exercise (such as squat, leg press or machine squat, or lunge or step exercise) and one leg extension exercise every workout. First: A compound exercise (alternate different ones every other workout) Second: An isolation exercise	6-8
Three-day training split	3	Choose two compound exercises and one leg extension exercise every workout. First: A squat exercise Second: A leg press or machine squat or lunge or step exercise Third: A leg extension exercise	9-12
Four-day training split	4	Choose three compound exercises and one leg extension exercise every workout. First: A squat exercise Second: A leg press or machine squat exercise Third: A lunge or step exercise Fourth: A leg extension exercise	12-16
Five-day training split	4-5	Choose three or four compound exercises and one leg extension exercise every workout. First: A squat exercise Second: If doing four exercises total, do a leg press or machine squat exercise; if doing five exercises total, the second can be another squat or a leg press Third: If doing only four exercises total, do a lunge or step exercise; if doing five exercises and the second is a squat, the third could be a leg press exercise; if doing five exercises and the second is a leg press, the third could be a squat machine exercise or a lunge exercise Fourth: If doing only four exercises total, do a leg extension exercise; if doing five exercises and the third is a leg press or squat machine exercise, the fourth could be a lunge or step exercise; if doing five exercises and the third is a lunge, the fourth should be a step exercise Fifth: A leg extension exercise	12-20
Twice-a-day training split	4	Choose three compound exercises and one leg extension exercise every workout. First: A squat exercise Second: A leg press or machine squat exercise Third: A lunge or step exercise Fourth: A leg extension exercise	12-16

Hamstrings and Gluteus Maximus

The hamstrings are the muscles on the back of the thigh. The gluteus maximus, also referred to as the *glutes,* are the large buttock muscles. The glutes are involved in extending the legs back (as when standing up from a seated position) and kicking the legs back behind the body. The hamstrings are composed of the biceps femoris, the semitendinosus, and the semimembranosus. Collectively the hamstring muscles not only flex the knee, as when you bend your knee, but they also work in conjunction with the glutes to extend the legs at the hips (see figure 5.9).

Although compound quadriceps exercises like the squat, hack squat, lunge, and step-up are traditionally considered quadriceps exercises, they also largely involve the glutes and the hamstring muscles. For this reason, most bodybuilders perform fewer hamstring exercises than quadriceps exercises in order to prevent overtraining of the hamstrings and glutes.

Even though the hamstrings involve three different muscles that work together to perform leg flexion and hip extension, specific exercises better target each muscle. The Romanian deadlift hits the entire hamstring fairly evenly along with the glutes because of the hip extension involved in this exercise. The biceps femoris is better targeted with lying and standing leg curls. The semitendinosus and semimembranosus, on the other hand, are better targeted with seated leg curls. Therefore, a thorough hamstring workout should include one exercise that involves hip extension (such as the Romanian deadlift) and knee flexion (such as the leg curl). For a complete listing and detailed descriptions of all hamstring exercises, see chapter 19. If following a whole-body training split, you may forfeit specific hamstring exercises since the compound quadriceps exercises also use the hamstrings and glutes very strongly. For basic guidelines for designing hamstring and glute workouts based on the current training split used, see table 5.17.



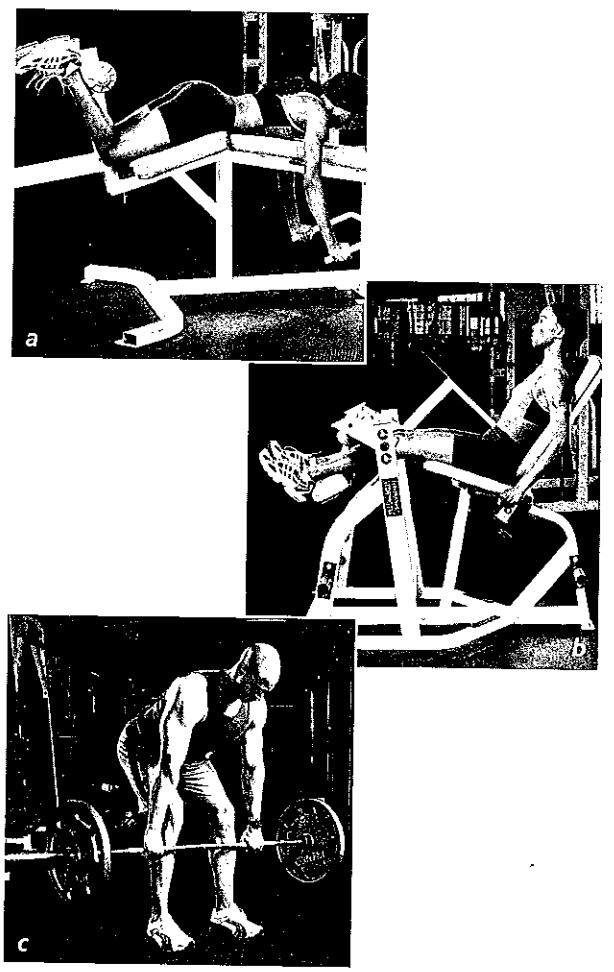


Figure 5.9 Hamstrings and gluteus muscles: *(a)* the biceps femoris is targeted by the lying leg curl; *(b)* the semitendinosus and semimembranosus are targeted by the seated leg curl; and *(c)* the glutes are targeted by the Romanian deadlift.

Table 5.17 Hamstrings and Glutes Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Alternate hip extension exercises and leg curl exercises every other workout.	2-4
Upper- and lower-body training split or two-day training split	2	First: A hip extension exercise Second: A leg curl exercise Frequently change the type of hip extension and leg curl exercises used.	4-8
Three-day training split	2	First: A hip extension exercise Second: A leg curl exercise Frequently change the type of hip extension and leg curl exercises used.	4-8
Four-day training split	2-3	First: A hip extension exercise Second: A leg curl exercise (whether doing two or three total exercises) Third: Another leg curl exercise Frequently change the type of hip extension and leg curl exercises used.	4-12
Five-day training split	2-3	First: A hip extension exercise Second: A leg curl exercise (whether doing two or three total exercises) Third: Another leg curl exercise Frequently change the type of hip extension and leg curl exercises used.	4-12
Twice-a-day training split	2-3	First: A hip extension exercise Second: A leg curl exercise (whether doing two or three total exercises) Third: Another leg curl exercise Frequently change the type of hip extension and leg curl exercises used.	4-12

Calves

Calves refer to two separate muscles on the lower leg. These muscles are the gastrocnemius (a muscle shaped like an upside-down heart) and the soleus (a muscle that lies underneath the gastrocnemius), as shown in figure 5.10. Both muscles perform extension at the ankle, such as when you stand up on your toes.

Certain exercises are better than others at targeting the two calf muscles. For detailed descriptions of all calf exercises, refer to chapter 20. Standing calf raises, or any calf raise that involves a fairly straight knee, is better at focusing the stress to the gastrocnemius. The soleus, on the other hand, is better targeted with seated calf raises or any calf raise that is performed with the knee bent to about 90 degrees.

The best way to train calves is to include one or two exercises that target the gastrocnemius muscle and one exercise that targets the soleus muscle. Most bodybuilders train their calves after thighs. Some also include a second or third workout of the calves if they do not train legs twice a week. The reason for this is that the calves, particularly the soleus, are made up of a higher percentage of slow-twitch muscle fibers. These muscle fibers have a high-endurance capacity and recover more quickly than fast-twitch muscle fibers. This is also the reason that many bodybuilders train their calves with very high reps (20 to 30 reps per set). However, the best way to train calves is with the use of a periodized program that cycles the number of reps performed. For basic guidelines for designing calf workouts based on the current training split used, see table 5.18.

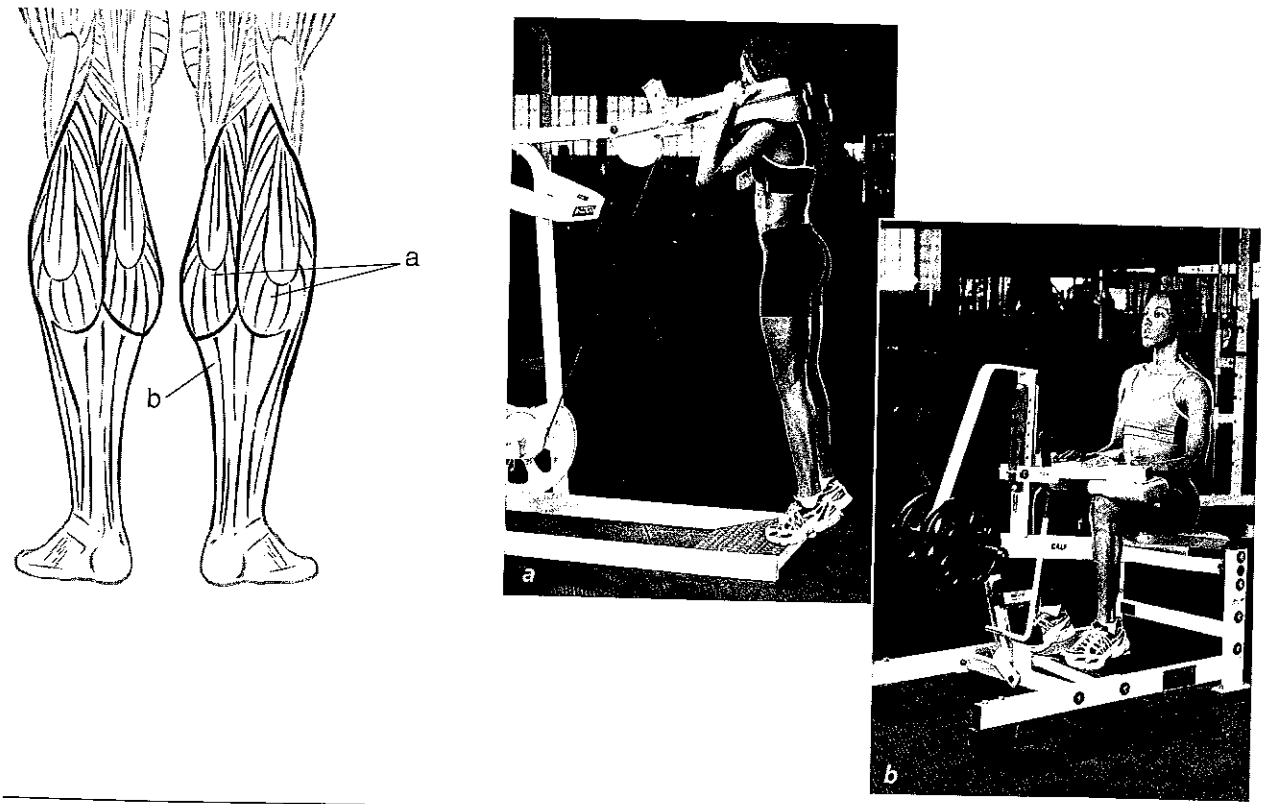


Figure 5.10 Calf muscles: *(a)* the gastrocnemius is targeted by the standing calf raise, and *(b)* the soleus is targeted by the seated calf raise.

Table 5.18 Calf Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Alternate gastrocnemius exercises and soleus exercises every other workout.	3-6
Upper- and lower-body training split or two-day training split	2	First: A gastrocnemius exercise (frequently change the type) Second: A soleus exercise (on occasion perform the soleus exercise first)	6-10
Three-day training split	2	First: A gastrocnemius exercise (frequently change the type) Second: A soleus exercise (on occasion perform the soleus exercise first)	6-10
Four-day training split	2-3	First: A gastrocnemius exercise (frequently change the type) Second: If doing only two exercises, do a soleus exercise (on occasion perform the soleus exercise first); if doing three exercises, the second should be a gastrocnemius exercise Third: A soleus exercise (on occasion perform it first or second)	6-12
Five-day training split	2-3	First: A gastrocnemius exercise (frequently change the type) Second: If doing only two exercises, do a soleus exercise (on occasion perform the soleus exercise first); if doing three exercises, the second should be a gastrocnemius exercise Third: A soleus exercise (on occasion perform it first or second)	6-12
Twice-a-day training split	2-3	First: A gastrocnemius exercise (frequently change the type) Second: If doing only two exercises, do a soleus exercise (on occasion perform the soleus exercise first); if doing three exercises, the second should be a gastrocnemius exercise Third: A soleus exercise (on occasion perform it first or second)	6-12

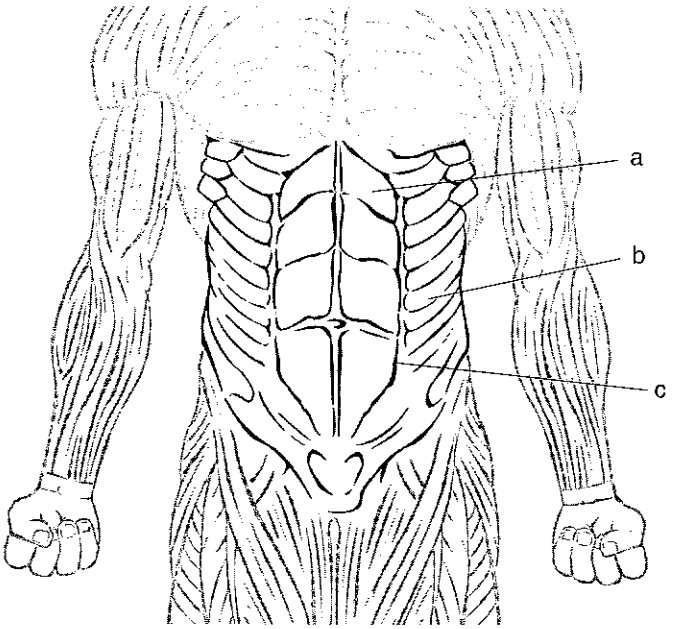
Abdominals

Abdominals refer to four muscles that are on the midsection, informally called abs by most bodybuilders. These include the rectus abdominis, the external obliques, the internal obliques, and the transverse abdominis (see figure 5.11). The best abdominal program uses exercises that target all four areas of the abdominal region—upper abs, lower abs, internal and external obliques, and the transverse abdominis.

The upper abs are best targeted with crunch exercises that involve flexing the upper spine forward by bringing the shoulders toward the hips, such as the standard crunch. The lower abdominals are best trained with exercises that involve flexing the lower spine forward by bringing the knees toward the chest, such as hanging knee raises. Both the internal and external obliques are best targeted by exercises that flex the spine laterally to the left and right, such as oblique crunches. They also are targeted with exercises that involve flexing the spine forward and rotating it to the left or right, such as with crossover crunches. The deep transverse abdominis is best trained with core exercises that force the flexing of the transverse abdominis (pulling the navel in toward the spine) to stabilize the spine and pelvis. For a complete listing and detailed descriptions of all abdominal exercises, see chapter 21.

Most bodybuilders train the abdominals more frequently and with higher reps than they use with most other major muscle groups. This is because the abdominals are postural muscles that stay flexed for long periods to support the spine. Therefore, they tend to be higher in slow-twitch muscle fibers than the other muscle groups. Most bodybuilders train the abdominals a minimum of three times per week and some train them every day. For most people, training abdominals on two or three nonconsecutive days per week will suffice. Because the abdominals are often trained with no more resistance than the person's body weight, they are frequently trained with reps in the range of 15 to 30. The reason for this is that most bodybuilders want to avoid overdeveloping the abdominal muscles and developing a thicker-appearing waist. By keeping the abdominals well developed but not too large, the bodybuilder makes the waist looks narrower, which helps to make the back and shoulders appear wider. However, even abdominal training should be periodized to cycle the rep range used.

The best way to train the abdominals is by choosing four exercises that each target a different area of the abdominals for each workout. However, if you train with a whole-body, upper- and lower-body, or two-day training split, you won't have the time to do four separate abdominal exercises. In this case, you should choose one or two exercises that target one area of the abdominals and rotate the abdominal region trained for every workout. For basic guidelines for designing abdominal workouts based on the current training split used, see table 5.19.



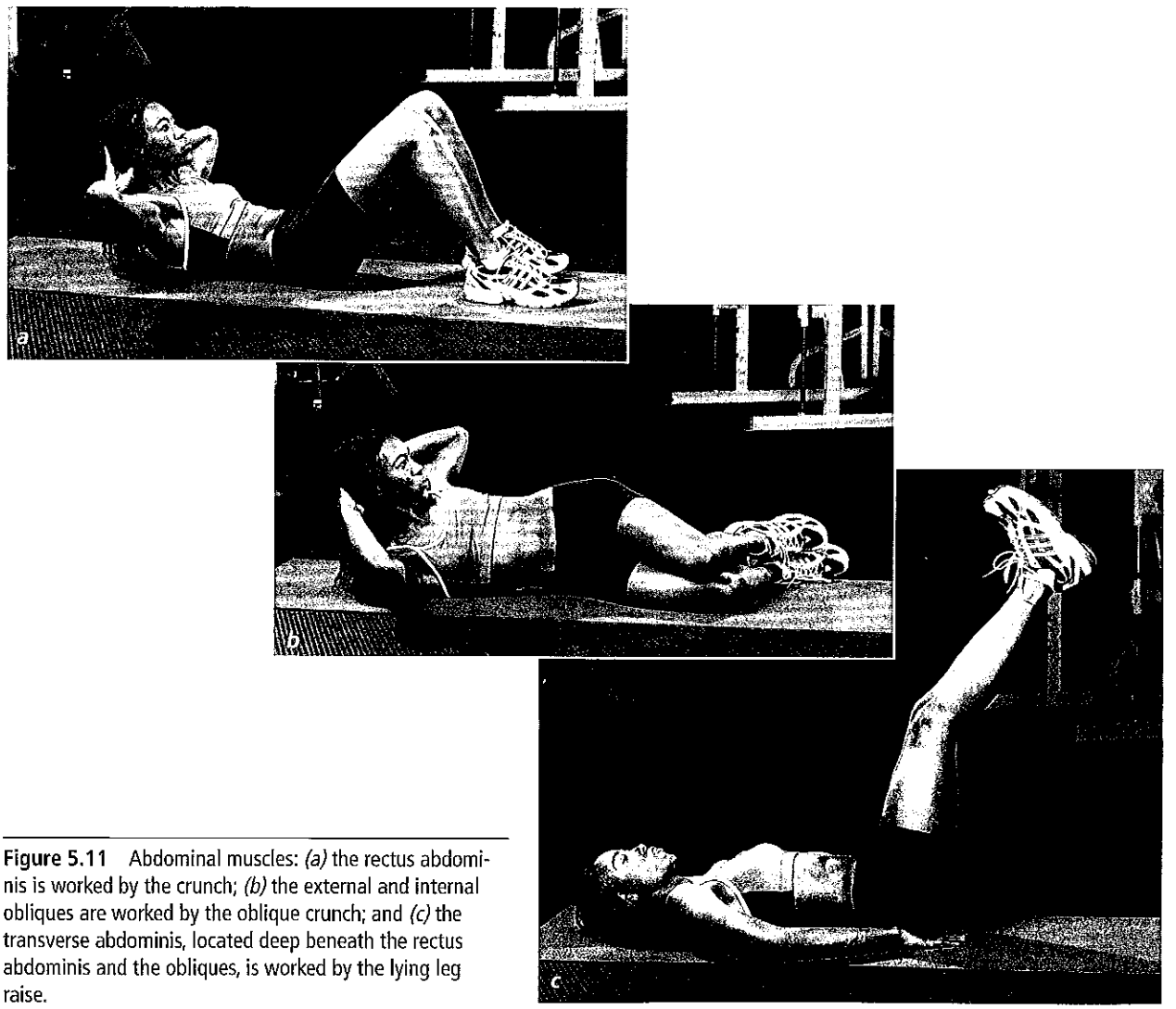


Figure 5.11 Abdominal muscles: *(a)* the rectus abdominis is worked by the crunch; *(b)* the external and internal obliques are worked by the oblique crunch; and *(c)* the transverse abdominis, located deep beneath the rectus abdominis and the obliques, is worked by the lying leg raise.

Table 5.19 Abdominal Training Guidelines Based on Training Split

Training split	Number of exercises	Exercise order	Total sets
Whole-body training split	1	Alternate upper abdominal exercises, lower abdominal exercises, oblique exercises, and core exercises every other workout.	3-4
Upper- and lower-body training split or two-day training split	2	Choose two exercises that target one area of the abdominals and alternate upper-abdominal exercises, lower-abdominal exercises, oblique exercises, and core exercises every other workout.	6-8
Three-day training split	3	First: A lower-ab exercise (frequently change the type) Second: An upper-ab exercise (frequently change the type) Third: An oblique exercise Every other ab workout, do a core exercise as the first exercise and skip the oblique exercise.	6-10
Four-day training split	3-4	*If doing only three exercises total:* First: A lower-ab exercise Second: An upper-ab exercise Third: An oblique exercise Every other ab workout, do a core exercise as the first exercise and skip the oblique exercise. *If doing four exercises total:* First: A core exercise Second: A lower-ab exercise Third: An upper-ab exercise Fourth: An oblique exercise	6-16
Five-day training split	4	First: A core exercise Second: A lower-ab exercise Third: An upper-ab exercise Fourth: An oblique exercise	8-16
Twice-a-day training split	4	First: A core exercise Second: A lower-ab exercise Third: An upper-ab exercise Fourth: An oblique exercise	8-16

CHAPTER 6

Programs for Building Muscle Mass

Building muscle mass takes considerable time and consistency in the gym. But one problem that arises from consistency is that the muscles quickly adapt to a workout when it is used for too long. To prevent muscle adaptation from turning into stagnation, you need to frequently expose your muscles to different training techniques. Having numerous techniques to draw from allows you to continually provide new training stimuli to your muscles for optimal growth. This chapter presents training methods that are effective for maximizing muscle mass.

The techniques are categorized by the type of acute variable of training that is being manipulated in each workout. Each technique is rated on a scale of 1 to 5 for four critical areas:

1. **Time**—the amount of time that a specific workout typically takes to complete. This helps you immediately determine whether this training technique will fit your training schedule. The higher the number, the longer the workouts for that specific technique will take to complete.
2. **Length**—the amount of time required for following the program consistently before appreciable results are noticeable. This helps you determine whether you have the patience required in order for a certain program to demonstrate results. The higher the number, the longer you must follow this technique in order to realize results.
3. **Difficulty**—the amount of weightlifting experience required for using the program effectively. This helps you decide whether you have enough training experience to take on specific training techniques. The higher the number, the more training experience you should have before attempting that particular technique.
4. **Results**—how effective the program seems to be for mass gains in most people. This helps you estimate how much muscle mass you can expect to gain with each program. The higher the number, the greater gains in muscle mass you can expect from a particular program.

Each training technique provides a sample workout to give you an indication of how the particular technique can be used. Some provide details on exercise selection, rep ranges, total sets, and training frequency that you need to follow closely. However, others offer just a snapshot for one particular workout or one workout cycle. These are just templates, and you are encouraged to substitute your own exercises where warranted to maintain variety.

Although you need not use every method listed in this chapter, if you have more than a year of training experience, you should eventually try a majority of the methods to determine those that work best for you. Then you can cycle these techniques, along with the basic programs covered in chapter 5, to create a periodized program that delivers the desired results and prevents the muscles from stagnating. Chapter 7 covers periodized schedules for building muscle mass using the programs and techniques covered in chapters 5 and 6. In the programs, weights are given in pounds; please see appendix for metric conversions.

PROGRAMS THAT MANIPULATE SETS

The following training techniques alter the sets performed during a workout. This can be done by increasing the number of exercises performed that make up one set, by limiting the number of sets performed per muscle group, or by increasing the number of sets performed for an exercise in a given time. They all are effective ways to increase your training intensity.

Superset Training

Superset training is a method that pairs exercises for agonist and antagonist muscle groups, such as biceps and triceps, and involves performing a set for each muscle group back to back with no scheduled rest between exercises. See table 6.1 for sample exercise pairs that work well for supersets. Superset workouts typically consist of two or three exercise pairs for each muscle group. See table 6.2 for a sample triceps and biceps superset workout. Superset training offers several advantages over straight-set training. The most obvious advantage is time. Because of the limited rest between exercises, superset workouts are generally quicker to perform than other training methods that allow rest periods between sets and exercises. Another advantage of supersets is that you'll actually be stronger in the second exercise. Research has found that a muscle will be stronger if preceded immediately by a contraction of its antagonist, or opposing muscle group. For example, when you do a superset of barbell curls and triceps extensions, in that order, you'll be stronger on the triceps extension and vice versa. This happens because normally the muscle you're training is somewhat limited by its antagonist. When bench-pressing using straight sets, for instance, the back muscles inhibit the contraction of your pecs to a certain extent. Doing a set of rows shortly before benching, however, lessens this inhibitory effect, allowing your pecs to contract more forcefully. As a result, you'll be able to train with more weight and get stronger and bigger. Another benefit to superset training is enhanced recovery. When you alternate every set of triceps with a set of biceps, you increase blood flow to those muscles because when you're doing curls, your triceps are still contracting, which increases blood flow to them and aids in recovery. This helps your body remove waste products and damaged muscle tissue as a result of exercise. Keep rest periods short between supersets (1 to 2 minutes).

Rating

Time	1	**2**	3	4	5
Length	1	**2**	3	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	3	**4**	5

Table 6.1 Superset Training Pairs

Muscle pair	Exercises
Chest and back	Bench press and barbell row
Shoulders and back	Shoulder press and pull-up
Biceps and triceps	Barbell curl and triceps pressdown
Quadriceps and hamstrings	Leg extension and leg curl

Table 6.2 Supersets for Biceps and Triceps

Exercise	Sets	Reps
Barbell curl	3	8-10
Superset with		
Triceps pressdown	3	8-10
Preacher curl	3	8-12
Superset with		
Lying triceps extension	3	8-10
Seated dumbbell curl	3	8-12
Superset with		
Triceps bench dip	3	8-12

Compound-Set Training

Compound-set training is similar to superset training except that the two exercises that are done back to back are performed for the same muscle group. As an example for shoulders, a lifter would perform a set of shoulder presses and immediately follow that set with a set of lateral raises with no break. That equals one compound set. After the set of lateral raises is finished, the lifter would rest for a couple of minutes and then start back with shoulder presses. This might be performed for two or three compound sets. The compound can then be followed with other shoulder exercises that are performed either in straight sets or as another compound set. While the exercise choices are not that critical, there are two strategies that are usually used with compound sets. Exercise choices can be made either to target a different section of the desired muscle group (such as the dumbbell shoulder press and the bent-over lateral raise) or to target a similar part of the muscle group (such as the dumbbell shoulder press and the machine shoulder press). The major benefits of compound-set training are intensity and time. Training two exercises for one muscle group without any rest between exercises significantly increases the intensity of the workout and places greater demands on the muscle fibers being trained as well as on your entire body. This results in a greater response of growth hormone after the workout, which helps to further drive muscle growth. It also dramatically reduces the amount of time required to train a muscle group. This makes it a great workout technique when you want to push a particular muscle group beyond its comfort zone or when you are short on time. Because compound-set training is a very high-intensity technique, you should use it infrequently or for short periods, because overtraining is possible if done for too long. See table 6.3 for a sample compound-set shoulder workout.

Rating

Time	1	**2**	3	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	3	**4**	5

Table 6.3 Shoulder Compound Set

Exercise	Sets	Reps
Dumbbell shoulder press	3	6-8
Compound set with		
Lateral raise	3	10-12
Front raise	3	10-12
Compound set with		
Upright row	3	8-10

Tri-Set Training

Tri-set training is an extended compound set. It uses three exercises for the same muscle group back to back with no rest between sets, as opposed to just two exercises. For smaller muscle groups like biceps, triceps, and deltoids, one group of tri-sets performed for two to four sets is typically enough to train the muscle group effectively. When smart exercise choices are selected, one tri-set can properly target all areas of most major muscle groups. As with compound-set training, the major benefits of tri-set training are higher-intensity training and less training time required. Of course, it also means that the technique should be used infrequently and for short periods to prevent overtraining. See table 6.4 for an example of a triceps tri-set workout.

Rating

Time	**1**	2	3	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	4	**5**

Table 6.4 Triceps Tri-Set

Exercise	Sets	Reps
Triceps pressdown	3	8-10
Seated overhead triceps extension	3	6-8
Bench dip	3	8-12

Giant-Set Training

Giant-set training is similar to compound-set and tri-set training in that multiple exercises are done for a single muscle group back to back with no rest between sets. The difference is in the number of exercises performed. Giant sets incorporate four or more exercises. Giant sets or tri-sets are a great way to quickly hit any muscle group from a variety of angles. The benefits are similar to those of compound and tri-sets. See table 6.5 for a sample giant-set routine for abs.

Rating

Time	1	2	3	4	5
Length	1	2	3	4	5
Difficulty	1	2	3	4	5
Results	1	2	3	4	5

Table 6.5 Giant Set for Abdominals

Without taking a rest, perform one set of each exercise listed. Then rest for a few minutes and follow the exercise order again.

Exercise	Sets	Reps
Hanging knee raise	3	15
Crossover crunch	3	20
Reverse crunch	3	15
Cable crunch	3	12

High-Intensity Training

High-intensity training (HIT) is a method based on the one-set training concept that was popularized by Arthur Jones (founder of Nautilus) and professional bodybuilder Mike Mentzer. The foundation of this training method involves very low volume and very high intensity. Most followers do as few as one set per exercise and only one to three exercises per muscle group (see table 6.6). Intensity for this technique is not so much about the weight used but about training beyond the point of muscle failure. Every set must be taken beyond failure with the use of forced reps, negative-rep training, and even partial-rep training (where as much of the range of motion of the exercise is performed until the weight cannot be budged). The theory behind HIT is that if multiple sets of an exercise are performed, every set cannot be trained with maximal intensity. By doing one and only one set of an exercise, you have a better chance of training with maximal intensity.

Volume is also kept low with HIT to minimize the time spent in the gym. Training sessions that are longer than 45 minutes tend to cause greater elevations in cortisol levels than with shorter training sessions. Since cortisol is a catabolic hormone that influences breakdown of muscle protein and inhibits the ability of testosterone to bind to its receptors, limiting its rise after training is a desirable thing. Because volume is low with

Table 6.6 Big HIT Workout

MONDAY AND THURSDAY		
Exercise	**Sets**	**Reps**
Barbell incline bench press	1	8-10
Dumbbell pullover	1	8-10
Dumbbell fly	1	8-10
Barbell shoulder press	1	8-10
Dumbbell lateral raise	1	8-10
Dumbbell shrug	1	8-10
Barbell row	1	8-10
TUESDAY AND FRIDAY		
Squat	1	8-10
Leg extension	1	8-10
Leg curl	1	8-10
Standing calf raise	1	8-12
Barbell biceps curl	1	8-10
Seated incline curl	1	8-10
Triceps dip	1	8-10
Triceps pressdown	1	8-10
Hanging knee raise	1	10-15

HIT, it allows the lifter to follow a whole-body training split or a two-day training split, depending on whether the lifter wants to train each muscle group two or three times per week.

There is no research to specifically support the theory of HIT, and anecdotal reports are varied. Some lifters experience considerable gains in strength and muscle mass. But for most, the progress soon comes to a halt. The problem may lie in the fact that volume is an acute variable that does not get manipulated in this program. Therefore, following HIT for only four to six weeks would be a smart way to use it. After training with HIT you should switch to a training program that uses fairly high volume. The sample HIT program in table 6.6 is a two-day split done twice a week. In this program, each set should be preceded with one short warm-up set before each exercise with approximately 50 percent of the weight you will use for the main working set. Do only about four to six reps with this lighter weight. Perform each set to muscle failure and have a spotter help you perform three or four forced reps after reaching muscle failure. Resist the negative portion of the forced reps for added intensity and consider attempting a few partial reps at the very end of the set.

Rating

Time	**1**	2	3	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Nubret Pro-Set Method

This method, named after International Federation of Bodybuilding and Fitness professional bodybuilder Serge Nubret of France, incorporates a progression method that increases the number of sets done on an exercise with each workout. It also requires that you do that in the same amount of time as for the previous workout. For example, if you do three sets of barbell curls for 10 reps in five minutes in one workout, you must try to get four sets of 10 reps in five minutes in the following workouts until you reach that goal. The only way to do more sets in the same amount of time is to reduce your rest period between sets. Therefore, this method increases strength and muscle mass by enhancing the ability of the muscles to recover between sets. The best way to use this technique is to do it first in your workout using one exercise for each muscle group. See table 6.7 for a sample progression of the Nubret pro-set workout in which the lifter required four weeks to increase his total work from three sets of 10 in five minutes to four sets of 10 in five minutes.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 6.7 Nubret Pro-Set Method

Week	Sets	Reps	Total time
1	3	10	5 min
2	2	10	5 min
	1	8	
	1	6	
3	3	10	5 min
	1	8	
4	4	10	5 min

PROGRAMS THAT MANIPULATE REPETITIONS

Although the rep is the smallest part of the workout, manipulating it can lead to big gains in muscle mass. The following training techniques alter the reps performed in each workout. This can be done by using specific rep ranges, using extremely high-rep training, dividing the reps up throughout the day, altering the range of motion of specific reps, performing reps with additional help after muscles have fatigued, changing the speed at which reps are performed, or emphasizing a certain part of the rep. These all work to boost muscle growth one rep at a time.

5–10–20 Training

This program is actually an advanced version of tri-sets (see Tri-Set Training on page 77). With most tri-set programs you perform equal reps on all three exercises, but this one uses very specific repetition ranges for each exercise. The first exercise in the tri-set is done for just 5 reps. This is a good rep range for boosting muscle strength. The second exercise is done for 10 reps. This is the ideal rep range for building muscle mass. The last exercise in the tri-set is done for 20 reps. This rep range enhances muscle endurance and can help in reducing body fat. Combining all three of these rep ranges gives you a program that trains the muscles in every respect necessary to get them big, lean, and strong.

Exercise selection plays an important role in the 5–10–20 program because of the imposed rep ranges. The first exercise should be a basic exercise, preferably using a barbell. Because the reps on this exercise are so low for building strength, basic multijoint exercises with a barbell are best (see table 6.8 for sample exercise choices for each exercise). The second exercise is done with a moderate number of reps for putting on muscle size; therefore, it should be another basic exercise (similar to the first) but performed with either dumbbells or a machine. The third exercise is the high-rep set, so the best exercise choices are single-joint isolation moves. These can be done with dumbbells, but cables or machines are your preferred method to give your muscles continuous tension throughout the entire range of motion.

Because this program is so demanding on the muscles and on your entire body, you'll need to get plenty of rest for optimal recovery. Allow each muscle group trained with the 5–10–20 program at least five days of rest before training them again. We suggest you plan on working each muscle group just once per week, as shown in table 6.9. Remember that you can substitute these exercises for any of the appropriate ones in table 6.8. Perform one set of each exercise, resting just long enough to get set up on the next exercise. After the last exercise is completed, rest two minutes before repeating in the same order. Repeat for a total of two to four tri-sets. Follow the program for no longer than 6 weeks. This is a fairly grueling regimen to maintain for any longer, and you may risk overtraining if you try to train this program for longer than six weeks. But don't think that you have to train every body part with 5–10–20. You can choose to train just one or a few of your troublesome body parts with the 5–10–20 program to bring them up to par with the rest of you.

Rating

Time	**1**	2	3	4	5
Length	1	2	**3**	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	**3**	4	5

Table 6.8 Choosing 5s, 10s, 20s

Muscle group	Exercise choices
	FIRST EXERCISE
Chest	Barbell bench press, incline barbell bench press, decline barbell bench press
Deltoids	Barbell shoulder press (seated or standing)
Back	Barbell row, pull-up
Thighs	Squat
Triceps	Close grip bench press, triceps dips
Biceps	Barbell curl
	SECOND EXERCISE
Chest	Dumbbell bench press, machine chest press (flat, incline, or decline versions)
Deltoids	Overhead dumbbell press, machine overhead press
Back	Dumbbell row, cable row, machine row, pulldown (various grips)
Thighs	Leg press, lunge, dumbbell step-up
Triceps	Lying or seated triceps extension
Biceps	Dumbbell curls (standing, seated, or incline)
	THIRD EXERCISE
Chest	Dumbbell fly or cable fly (incline, flat, or decline), cable crossover, pec deck
Deltoids	Dumbbell, cable, or machine lateral raise; bent-over lateral raise; front raise
Back	Straight-arm pulldown
Thighs	Leg extension, leg curl (lying, seated, or standing)
Triceps	Triceps pressdown, machine triceps extension
Biceps	Cable concentration curl or machine curl

Table 6.9 5–10–20 Blocks

Exercise	Sets	Reps
THIGHS		
Barbell squat	4	5
Dumbbell lunge	4	10
Leg curl	4	20
BACK		
Bent-over barbell row	3	5
Pulldown	3	10
Straight-arm pulldown	3	20
BICEPS		
Barbell curl	2	5
Incline dumbbell curl	2	10
Machine preacher curl	2	20

Exercise	Sets	Reps
CHEST		
Incline bench press	3	5
Flat dumbbell press	3	10
Cable crossover	3	20
TRICEPS		
Triceps dip	2	5
Lying triceps extension	2	10
Triceps pressdown	2	20

Finish Pump Method

This method involves training with basic exercises and heavy weight in the beginning of the workout. For example, a chest workout would start with an exercise such as the bench press for sets of 6 to 8 reps, and then continue with the dumbbell press for sets of 8 to 10 reps, and then finish with dumbbell flys for sets of 12 to 15 reps and cable crossovers for sets of 15 to 20. This concept takes advantage of the enhanced blood flow from the higher-rep training to deliver more water (which enters the muscle to create the pump), oxygen, nutrients, and anabolic hormones to the muscles and help flush the waste products away from the muscle at the end of the workout. This helps to enhance recovery and stimulate muscle growth. See table 6.10 for a sample finish pump workout.

Rating

Time	1	2	**3**	4	5
Length	1	2	3	**4**	5
Difficulty	1	**2**	3	4	5
Results	1	2	**3**	4	5

Table 6.10 Finish Pump for Quadriceps

Exercise	Sets	Reps
Squat	3	6-8
Leg press	3	8-10
Lunge	3	12-15
Leg extension	3	15-20

Hundreds Training

Hundreds training is an extremely hard-core method that incorporates very high repetitions—100 reps per set, to be exact. The weight you will use to complete 100 reps is around 20 to 30 percent of a weight you can use for 10 strict reps. For example, if you use 50-pound dumbbells for 10 reps on dumbbell curls, you will use 10- to 15-pound dumbbells when you do hundreds training. Try the 10-pound dumbbells to start, because you always want to start lighter than heavier. Your goal is to perform at least 70 reps before you stop for a quick breather. That is, you should fail before you reach 100 reps. If you can do all 100 reps with a given weight, without stopping, then the weight is too light and you will need to increase it for the next workout. You need to find a weight that allows you to complete 60 to 70 reps without stopping. Your mark for increasing the weight is when you can get 70 reps or more with a weight.

Let's walk through a sample set of standing dumbbell curls using the hundreds training approach. Grab your appropriately weighted dumbbells and perform dumbbell curls as you normally would with a heavier weight. Keep your form on the dumbbell curls strict as described on page 305 and keep your reps moderately paced and under control at all times. If you chose the correct weight, you will reach momentary muscle failure somewhere between rep 60 and rep 70. Here's where you get a rest but only for as many seconds as the number of reps you have left to complete. In other words, rest 1 second for every remaining rep you have left. If you completed 65 reps, then you rest 35 seconds, and then attempt to do the remaining 35 reps. If you fail to complete those final 35, use the same method—rest 1 second for every rep you have left until you reach the 100-rep mark. Sounds simple . . . until you actually try it. This method is only for those with at least one full year of consistent strength training experience.

The benefit of hundreds training is how it incorporates the muscle fibers in the muscle. Because the weight is so light and the reps are so high, it thoroughly trains the slow-twitch muscle fibers in the beginning of the set. All muscles are composed of two major types of muscle fibers—slow-twitch and fast-twitch muscle fibers. Slow-twitch muscle fibers tend to be used for endurance-type activities—therefore, higher reps tend to train them best. Fast-twitch muscle fibers are used for more powerful activities—therefore, they are better

trained with heavy weight and low reps, or with fast, explosive-type movements. Most muscles are close to 50 percent slow-twitch and 50 percent fast-twitch muscle fibers. This means it's a good idea to use techniques that train both types of muscle fibers. With hundreds training you will hit the slow-twitch muscle fibers during the first 60 reps or so. After that, your muscles will have to call on the fast-twitch muscle fibers to help out the fatigued slow-twitch fibers. Doing this many repetitions causes biochemical changes in the muscle, which aid in muscle growth. It also leads to greater growth of blood vessels that feed the muscle fibers to enhance the delivery of blood, oxygen, nutrients, and hormones to the muscle cells. This environment increases the growth potential of the muscle fibers.

The best way to use hundreds training is to train each muscle group twice per week. Therefore, following an upper- and lower-body training split or a two-day is ideal with this style of training. The only difference is that you can do up to three exercises for larger muscle groups (chest, back, and quadriceps) because you perform only one set per exercise with hundreds training. Try hundreds training for about two to four weeks; it is very intense and will be difficult to follow for any longer. Then follow it with a standard mass training that uses heavy weight and low reps. Another way to use hundreds training is to sporadically train one muscle group or your entire body with hundreds training for just one or two workouts to change your training style and shock the muscles for added growth. See table 6.11 for a sample training regimen using the hundreds training technique. Each of the workouts in this program is to be done twice weekly. For instance, you can do workout 1 on Monday and Thursday and workout 2 on Tuesday and Friday. Or you can allow a day of rest between every workout and do workout 1 on Monday and Friday and workout 2 on Wednesday and Sunday.

Rating

Time	**1**	2	3	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	3	**4**	5

Table 6.11 Hundreds Workouts

WORKOUT 1			
Muscle group	**Exercise**	**Sets**	**Reps**
Chest	Bench press	1	100
	Incline dumbbell fly	1	100
	Cable crossover	1	100
Back	Wide-grip pulldown	1	100
	Seated cable row	1	100
	Straight-arm pulldown	1	100
Shoulders	Smith machine shoulder press	1	100
	Dumbbell lateral raise	1	100
Trapezius	Dumbbell shrug	1	100
Abdominals	Cable crunch	1	100
WORKOUT 2			
Muscle group	**Exercise**	**Sets**	**Reps**
Quadriceps	Smith machine squat	1	100
	Leg press	1	100
	Leg extension	1	100
Hamstrings	Lying leg curl	1	100
Calves	Standing calf raise	1	100
	Seated calf raise	1	100
Biceps	Barbell curl	1	100
	Preacher curl	1	100
Triceps	Lying triceps extension	1	100
	Triceps pressdown	1	100

50–50 Method

This program helps to bring up the development of lagging muscle groups. Simply stated, this program involves the completion of 100 reps per day on one exercise for any body part that you deem is behind in growth. It is different from hundreds training in that you don't perform all 100 reps at one time, plus you do this for one muscle group every day for eight weeks. By doing so many reps every day, you enhance the endurance capacity of the muscle. Enhanced endurance is facilitated by an increase in the capillary density of the muscle. Capillary density refers to the number of capillaries (small blood vessels where nutrient and gas exchange take place between the blood and the muscle cells) a muscle is supplied with. Muscle hypertrophy tends to lower the capillary density because of the greater amount of muscle present. This also happens with low-rep, heavy-weight training, because this style of training forces the muscle to rely more on the energy it can derive within the muscle cell, not from the blood. By doing the 50–50 method, you can boost the capillary density of a muscle and therefore enhance the delivery of nutrients, anabolic hormones, and oxygen to the muscle. In addition, you enhance the removal of biochemical waste products from the muscle. This results in bigger muscle pumps, more rapid recovery of the muscle, and ultimately greater potential for muscle growth.

To follow the 50–50 method, choose the muscle group you want to bring up to par with the others. Then choose one exercise for that muscle group. This will be the exercise you will do every day, even on the days you don't normally train that muscle group. See table 6.12 for a list of the best exercises to use with the 50–50 method. You will need to perform 100 reps a day of that exercise in two segments in the day. That means you will perform 50 reps at a time, separated by about 8 to 12 hours, with a weight that challenges you but is not so heavy it causes you to fatigue by the 50th rep. For example, if you want to build up your biceps, you will do 50 reps of dumbbell curls in the morning—say at 9:00 a.m.—and again in the evening—maybe at 9:00 p.m. The weight you use is critical to your success. If it's too heavy, then it is likely to lead to overtraining. A good rule is that when you reach the 50th rep you should feel as though you could complete about 10 more reps. Follow this program for no more than eight weeks to see decent results and prevent stagnation. You can, however, switch to other muscle groups and continue the 50–50 method.

Rating

Time	1	2	3	4	**5**
Length	1	2	3	**4**	5
Difficulty	1	**2**	3	4	5
Results	1	2	**3**	4	5

Table 6.12 50–50 Exercises

Muscle group	Best choice of exercises
Chest	Dumbbell bench press (flat or incline)
	Dumbbell fly (flat or incline)
	Push-up
Deltoids	Overhead dumbbell press (standing or seated)
	Dumbbell lateral raise
	Dumbbell upright row
	Bent-over lateral raise
Back	Dumbbell or barbell row
	Pulldown
	Straight-arm pulldown
Triceps	Triceps pressdown
	Lying dumbbell extension
Biceps	Dumbbell curl (standing, seated, or incline)
Forearms	Wrist curl (dumbbell or barbell)
	Reverse wrist curl (dumbbell or barbell)
Quadriceps	Squat
	Leg extension
Hamstrings	Leg curl (lying, seated, standing)
	Romanian deadlift (dumbbell or barbell)
Calves	Standing calf raise
	Donkey calf raise
Abdominals	Crunch

21s

This is an advanced method of training that challenges the working muscle group in three different ranges of motion within a single set. Its name comes from the total number of reps per set you perform with this training technique. In each set, you do a total of 21 repetitions but as three separate sets of 7 reps. You start the set from the start position and do 7 reps through the first half of the range of motion (see table 6.13). After you complete the first 7 reps, you do another 7 reps but only through the last half of the range of motion. When those 7 are complete, you finish with 7 reps through the full range of motion of that exercise. Using the barbell curl as an example, you start with your arms fully extended, holding a barbell across the front of your thighs. First you curl the weight up 7 times only to the point where your arms are parallel with the floor. Then you curl the weight up 7 times from the point where your arms are parallel with the floor to the point where they are close to your shoulders. After these 7 reps, you perform 7 standard barbell curls going through the full range of motion.

The 21s can be done with virtually any exercise but are most practical with single-joint isolation movements. Multijoint exercises, like the bench press and squat, involve so many secondary and stabilizing muscles that straight sets prove the most effective. See table 6.13 for a sample of the best exercises to use with 21s. Regardless of the exercise, you'll need to use lighter resistance than usual when doing 21s, since your muscles are unaccustomed to the increased number of reps. Using cables or machines for this training technique is an excellent way to maintain continuous tension on the muscle. This is especially important, because the tension on the muscle is typically decreased at full flexion when you use free weights.

With 21s you can most effectively work on flexibility within the joint during the first 7 reps, since you begin each rep with the working muscle in a fully stretched position. The middle 7 reps are most productive in terms of muscle growth and development, because you're stronger in the second half of the movement and you can squeeze the contraction at the top for maximum peaking. The last 7 reps essentially serve the purpose of burning out the muscles, which is great for initiating new growth.

To work 21s into your current routine, do three sets of them as the first exercise for a body part (after a proper warm-up, of course), then resume with straight sets for all other movements in that body-part workout. Or do one to three sets of 21s as the last exercise for a particular body part to burn it out. To avoid overtraining, decrease your volume for the body part you're doing 21s with by doing one fewer exercise in that workout. If on chest day you normally do three or four exercises, do two or three if you're doing three sets of 21s. Beginners should start off with only one set of 21s—remember, this is an advanced technique. You can increase to 2 or 3 sets after a couple of sessions. Follow this program for about four to eight weeks, and no more, because it loses its effectiveness after about eight weeks.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 6.13 Dealing 21s

Muscle group	Exercise	Breakdown form for 21s
Chest	Cable crossover	Form for this exercise is the same as for normal cable crossovers, as described on page 234. First 7 reps: Start with your hands outside your shoulders and contract your pecs until your arms are about 45 degrees to your torso. Next 7 reps: Go from 45 degrees to hands together, maintaining the same elbow angle from the start, and squeeze. Last 7 reps: Combine previous 2 for 7 complete reps.
Back	Lat pulldown	Form for this exercise is the same as for normal lat pulldown, as described on page 270. First 7 reps: Pull the bar toward your upper chest, keeping your elbows back, until your elbows are at approximately 90-degree angles. Next 7 reps: Start at 90 degrees and pull the bar all the way to your upper chest. Last 7 reps: Combine previous 2 for full-range reps.
Shoulders	Cable lateral raise	Form for this exercise is the same as for normal cable lateral raise, as described on page 254. First 7 reps: Raise your arm upward and outward, keeping your elbow locked in a slightly bent position, until your arm is at a 45-degree angle to the floor. Next 7 reps: Start at about 45 degrees and pull the weight up until your arm is just past parallel to the floor. Last 7 reps: Combine previous 2.
Quadriceps	Leg extension	Form for this exercise is the same as for normal leg extension, as described on page 333. First 7 reps: Extend your knees to where your shins are at 45-degree angles to the floor. Next 7 reps: Start at the 45-degree angle, straighten your legs, and squeeze your quads at the top. Last 7 reps: Combine previous 2.
Hamstrings	Lying leg curl (can also be done on seated leg curl)	Form for this exercise is the same as for normal lying leg curls, as described on page 339. First 7 reps: Flex your knees until your shins are just short of perpendicular to the floor. Next 7 reps: The end range is just bringing the pad up to your butt as much as possible. Last 7 reps: Combine previous 2.
Triceps	Triceps pressdown	Because the range of motion on triceps pressdown is relatively small, increase it when doing 21s by starting with your hands at upper-chest level. Start with your forearms about 30 degrees above horizontal, whereas normally they'd be parallel to the floor. Lock your upper arms and elbows at your sides. First 7 reps: Extend your arms until your elbows are just past parallel to the floor. Next 7 reps: Start at about parallel, extend your arms until your elbows are completely locked out, and squeeze your triceps. Last 7 reps: Combine previous 2.
Biceps	Single-arm cable curl	Form for this exercise is the same as for normal one-arm cable curl, as described on page 309. First 7 reps: Curl the weight up until your forearm is nearly parallel to the floor. Next 7 reps: Start at about parallel, curl the handle up until your elbow reaches full flexion, and squeeze at the top. Last 7 reps: Combine previous 2.

Four-Rep System

This program involves four different exercises for each muscle group. Each exercise is designed to hit the muscle from a variety of angles and provide a unique stimulus to the muscle. After a thorough warm-up, the first exercise should be a basic exercise (see table 6.14) and done for three sets of four reps. This rep range provides a stimulus for gains in strength. The second exercise can be another basic exercise, preferably a dumbbell version, or it can be an isolation exercise that minimizes the help of assistance muscle groups. Completing three sets of eight reps will provide the best stimulus for muscle growth. The third exercise should be an isolation exercise, performed for three sets of 12 reps. This rep number will provide a potent stimulus for muscle growth and will encourage biochemical changes in the muscle that will enhance muscle growth and endurance (the ability to do more repetitions with a given weight). The last exercise should be done for three sets of 16 reps to provide a significant pump to the muscle. This will drive more fluid into the muscle cells, and the stretch this provides is believed to stimulate muscle growth. This final exercise can be either an isolation exercise or a basic exercise for that given muscle group, depending on what exercise was done for the second exercise.

Because of the higher volume involved with this program, you should split your workouts into three separate body regions. For instance, workout 1 could be chest, shoulders, triceps, and abs; workout 2 could be back and biceps; and workout 3 could be thighs, calves, and abs. Depending on how well you recover, you may consider training each muscle group just once a week on the four-rep system. An alternative way to do the four-rep system is to perform four sets of each exercise. The first set will be done for 4 reps, the second set for 8 reps, the third set for 12 reps, and the last set for 16 reps. Do this with two or three exercises per muscle group. See table 6.15 for a sample back and biceps routine using the alternative four-rep system.

Table 6.14 Four to Grow

Muscle group	Exercises	Sets	Reps
Chest	Incline bench press	3	4
	Dumbbell bench press	3	8
	Decline fly	3	12
	Pec deck	3	16
Shoulders	Standing barbell press	3	4
	Dumbbell lateral raise	3	8
	Upright row	3	12
	Overhead dumbbell press	3	16
Triceps	Close grip bench press	3	4
	Triceps dips	3	8
	Lying triceps extension	3	12
	Triceps pressdown	3	16
Back	Bent-over row	3	4
	Pulldown	3	8
	Straight-arm pulldown	3	12
	Dumbbell row	3	16
Biceps	Barbell curl	3	4
	Incline dumbbell curl	3	8
	Concentration curl	3	12
	Preacher curl	3	16
Legs	Squat	3	4
	Romanian deadlift	3	8
	Leg extension	3	12
	Leg press	3	16

Rating

Time	1	2	3	**4**	5
Length	1	2	**3**	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	3	**4**	5

Table 6.15 Alternative Four-Rep System

Muscle group	Exercises	Sets	Reps
Back	Bent-over row	4	4, 8, 12, 16
	Pulldown	4	4, 8, 12, 16
	Straight-arm pulldown	4	4, 8, 12, 16
	Dumbbell row	4	4, 8, 12, 16
Biceps	Barbell curl	4	4, 8, 12, 16
	Incline dumbbell curl	4	4, 8, 12, 16
	Concentration curl	4	4, 8, 12, 16

Forced Repetitions

Forced repetitions allow you to get more reps on a set by having a spotter help you finish the set after you have reached failure. This lets you push your muscles to their limits and beyond, which is important for forcing muscle growth. After you have reached failure on a set, the spotter can help you to perform an extra two or three reps that you wouldn't have been able to get without help. Doing forced reps on the last set of an exercise is all you'll need to get a jump on muscle growth. Researchers have discovered why forced reps seem to work so well for pushing muscle growth. A study of 16 male athletes discovered that forced-rep training increased levels of growth hormone after training by almost three times more than a standard workout, as shown in figure 6.1 (Ahtianen, Pakarinen, Kraemer, and Hakkinen 2003). Growth hormone is an important anabolic hormone that is involved in stimulating the processes that drive muscle growth. Ahtianen and colleagues also studied muscle recovery after forced-rep training. They discovered that up to three days after the forced-rep workout the subjects' trained muscles had not fully recovered. Therefore, when using forced-rep training you should allow the trained muscle groups at least four and up to seven days of rest before training them again. You should use forced-rep training for no more than four weeks for any muscle group. This is a high-intensity technique that also elevates cortisol (a catabolic hormone) levels and can lead to overtraining.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	3	**4**	5

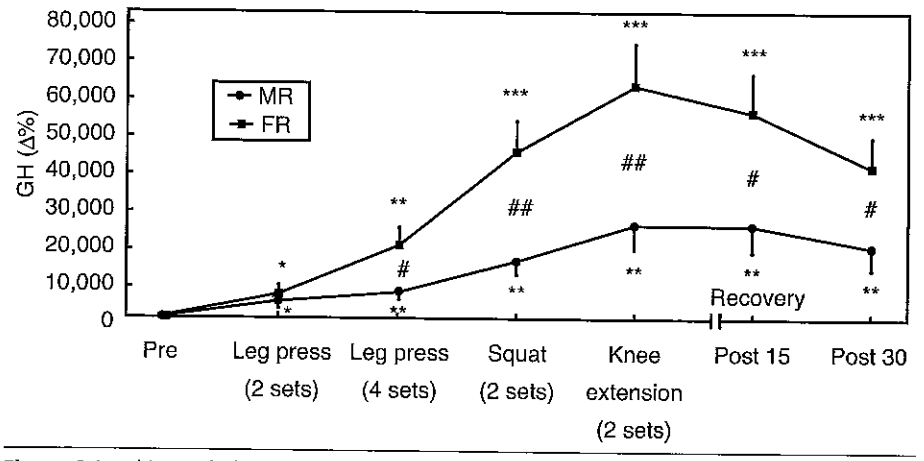


Figure 6.1 This graph depicts the response of the elevated growth hormone seen when subjects perform a forced-rep workout versus a normal workout. *Significantly different (* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$) from corresponding pre-exercise value. #Statistically significant difference (# = $p < 0.05$, ## = $p < 0.01$) between the maximum rep vs. forced rep loadings.

From J.P. Ahtianen, A. Pakarinen, W.J. Kraemer, and K. Hakkinin, "Acute hormonal and neuromuscular responses and recovery to forced vs. maximum repetitions multiple resistance exercises," *International Journal of Sports Medicine*, 2003; 24: 410-418. Adapted by permission.

Negative Repetitions

Like forced reps, negative reps for building size are best used at the end of a set when your muscles have reached failure. After you can no longer complete any more positive reps with a given weight, you can still do several negative reps. This is because muscles are much stronger on the negative portion of an exercise. Negative-rep training lets you take advantage of this fact and the fact that this high-intensity technique can spur new growth when done from time to time. Using negative-rep training for boosting muscle growth is different from using negative-rep training to improve muscle strength. For using negative-rep training to enhance muscle strength, see chapter 9. Resisting the weight down on the eccentric, or negative, portion of an exercise causes definite muscle damage. When muscle fibers are damaged, it sets off a cascade of steps that leads to muscle growth. It also develops protection from further eccentric overloading. That is why you want to use this technique infrequently. Once a tolerance for it has been built, the muscle damage is much less. Therefore, stopping after you have used it once or twice for a muscle group is the wisest way to add this technique to your training program. Then take a break from it for at least two months. You will need to do only two or three negative reps at the end of the last set for each exercise you do. Have a spotter or two—depending on the amount of weight you use—help you perform the positive portion of each rep. During the negative part of the rep, you should attempt to resist the weight by allowing it to slowly force your muscles through the negative repetition. It should take you no less than about three seconds to lower the weight through the negative rep. If you cannot resist the weight for at least three seconds, do not perform any more negative reps and finish the set.

Rating

Time	1	2	**3**	4	5
Length	**1**	2	3	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	**3**	4	5

Slow-Repetition Training

Slow-repetition training is a technique in which the repetitions are performed at a very slow speed. Although the term *slow-repetition training* covers a broad spectrum of possibilities, the most popular method is known as superslow training. This method requires you to slow your rep speed down to 10 seconds on the positive portion of the lift and an additional 10 seconds on the negative portion. You should use a weight that is about 50 to 70 percent of the weight you normally lift and attempt to complete 5 to 10 reps per set. Because of the intense nature of slow contractions, you need to perform only about two or three exercises per muscle group and only two sets per exercise. You should also allow five to seven days of rest for all major muscle groups trained with superslow training. Try this workout method for four to six weeks before changing to a different routine that involves normal-speed reps. Another way to incorporate superslow training into your lifting program is to do it every other workout for each muscle group or throw in one superslow rep set each workout for any muscle group—do it either at the beginning or at the end of the workout. There are many benefits to superslow training that make it an effective technique for adding muscle mass. It minimizes the momentum of the weight to maximize the force placed on the muscle being trained. It helps you to develop the connection between mind and muscle, because the slow movement forces you to concentrate on the muscle contraction. It progressively fatigues all the fibers of the muscles involved. It minimizes the risk of injury from poorly performed exercise movements. And it reduces the stress placed on the joints.

Rating

Time	**1**	2	3	4	5
Length	1	**2**	3	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	3	**4**	5

PROGRAMS THAT MANIPULATE LOAD

Because strength training involves lifting weights or resistance, the most fundamental change that can be done to manipulate a training program is to alter the amount of weight used. The following programs do just that—they manipulate the load, or resistance. This can be done by altering sets of heavy weight and light weight within a single workout or on each exercise during a workout. Some of these techniques alter the weight during a set. Regardless of the time line, the result from each of these is greater muscle mass.

Heavy and Light Method

This technique simply incorporates several heavy sets of an exercise followed by several light sets of that same exercise. The theory is that the heavy sets will stimulate the fast-twitch muscle fibers better while the lighter sets promote capillarization of the muscles and induce fatigue. This is often done with just one exercise, as shown in table 6.16. More experienced bodybuilders will sometimes do two exercises but with fewer total sets on each exercise. With this method, the first exercise (which is typically a basic or multijoint movement) is done with heavy weight and low reps, while the second exercise (which is often an isolation-type exercise) is done with very light weight and high reps (see table 6.17). For both programs, the exercises would be completed over a three- or four-day split. For example, workout 1 might be shoulders and thighs; workout 2 could train chest, back, and abs; workout 3 might complete the split with biceps, triceps, and calves.

Rating

Time	1	**2**	3	4	5
Length	1	2	**3**	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	**3**	4	5

Table 6.16 Heavy and Light Single-Exercise Sample Routine

Muscle group	Exercise	Sets	Reps
Shoulders	Shoulder press	4	5
		4	12
Legs	Squat	5	4
		1	15
Chest	Bench press	5	5
		2	12
Back	Barbell row	4	4
		3	15
Abs	Cable crunch	3	10
		3	25
Biceps	Barbell curl	4	5
		4	15
Triceps	Lying triceps extension	4	5
		5	15
Calves	Standing calf raise	4	8
		6	25

Table 6.17 Heavy and Light Multiple-Exercise Sample Routine

Muscle group	Exercise	Sets	Reps
Shoulders	Shoulder press	4	5
	Lateral raise	4	15
Thighs	Squat	5	4
	Leg press	5	15
Chest	Bench press	5	4
	Incline fly	4	15
Back	Barbell row	5	4
	Pulldown	5	15
Abdominals	Cable crunch	3	10
	Reverse crunch	3	25
Biceps	Barbell curl	4	5
	Preacher curl	3	15
Triceps	Lying triceps extension	4	5
	Triceps pressdown	3	15
Calves	Standing calf raise	3	8
	Seated calf raise	3	25

Triangle Method

The triangle method is a basic pyramid training system. The term *pyramid* refers to a stepwise increase and decrease in weight used with each set of an exercise. The triangle method starts off with three or four ascending sets. The first two or three are warm-up sets that are not taken to failure. The third or fourth set usually consists of a weight that allows for only four to six reps. After that set the weight is progressively lowered and the reps increase for another two or three sets. See table 6.18 for a sample workout using the triangle method. The benefit of the triangle method is that it allows you to slowly prepare the targeted muscle for very heavy weight. This helps to prevent injury. In addition, this method of training allows for varied rep ranges, which provide different stimuli to the trained muscles.

Rating

Time	1	2	3	**4**	5
Length	1	2	**3**	4	5
Difficulty	**1**	2	3	4	5
Results	1	2	**3**	4	5

Table 6.18 Triangle Chest Using Incline Bench Press

Set	Weight (pounds)	Reps	Rest
1	135	10	2 min
2	185	8	3 min
3	225	6	3 min
4	245	4	3 min
5	185	7	3 min
6	165	8	–

Rack Pyramid Method

This pyramid method is named after the dumbbell rack because it is best used with preset dumbbells found in most gyms. As with the triangle method, you start with a very light weight for 10 reps to warm up. Then you gradually increase the weights of each set by the smallest increase available (usually five pounds each dumbbell) until you can perform only one repetition. After that, if you're really up for punishing your muscles, reverse the order and decline in weight by the smallest decrease possible until you reach your starting point. Rest between sets should be kept to a minimum—about one to two minutes. The benefits of the rack pyramid method are similar to those of the triangle method in that it allows a proper warm-up for preparing the muscle for the intense training task ahead. It also provides a very broad range of reps for a variety of training stimuli to the muscle. It also gives the muscle an intense workout that is sure to kick-start muscle growth. Because this method is rather grueling on the targeted muscles, it's wise to use the rack pyramid method infrequently. It is best thrown into a workout to stimulate a lagging muscle group to grow. Using it too frequently for that muscle group can result in overtraining that will limit growth. One beneficial way to use the rack pyramid method is to use it for one exercise per muscle group The best exercises to use this method with are the basic dumbbell mass builders and isolation exercises. See table 6.19 for optimal exercises to use with the rack pyramid method. Table 6.20 provides a sample rack pyramid workout for the dumbbell biceps curl.

Rating

Time	1	2	3	4	**5**
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 6.19 Best Rack Pyramid Exercises

Muscle group	Exercise
Chest	Dumbbell press (flat, incline, decline)
	Dumbbell fly (flat, incline, decline)
Deltoids	Dumbbell press
	Dumbbell raise (front, lateral, rear)
	Dumbbell upright row
Back	Dumbbell row
Traps	Dumbbell shrug
Thighs	Dumbbell lunge
Triceps	Lying dumbbell triceps extension
	Overhead dumbbell triceps extension
Biceps	Dumbbell curls (standing, seated, incline)

Table 6.20 Rack It With the Biceps Curl

Set	Weight (pounds)	Reps	Rest
1	30	10	1 min
2	35	10	1 min
3	40	10	1 min
4	45	8	2 min
5	50	6	2 min
6	55	3	2 min
7	60	1	2 min
8	55	2	2 min
9	50	3	2 min
10	45	5	2 min
11	40	6	2 min
12	35	7	2 min
13	30	8	2 min

Inverted Pyramid

This pyramid system is the opposite of the triangle method. You simply start heavy, work down in weight, and then work back up. Because it is so difficult, it is one of the more uncommon methods of pyramid training. One example is that used by professional bodybuilder Dean Tornabane. You begin with a weight you can perform 6 to 10 reps with on your exercise of choice. Perform two more sets, in which you decrease the weight each set just enough to allow you to perform the same number of reps as you did on the first set. After the third set, you will do two more sets, increasing the weight by the same increments by which you decreased the weights previously. Because of the fatigue involved, the last two sets will likely be in the low repetition range of two to four. This is supposed to work synergistically with the higher-rep sets performed in the earlier sets to enhance muscle growth. See table 6.21 for a sample inverted pyramid program. This system can be performed with any exercise for most muscle groups, but it is best performed first in the workout with a basic exercise such as the bench press, shoulder press, squat, barbell curl, or triceps extension. This is best followed with straight sets of one or two isolation exercises for each muscle group.

Rating

Time	1	2	3	**4**	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	**3**	4	5

Table 6.21 Getting Inverted

Use the shoulder press after two or three warm-up sets.

Set	Weight (pounds)	Repetitions	Rest
1	185	8	2 min
2	175	8	2 min
3	160	8	2 min
4	175	4	2 min
5	185	2	–

Oxford Method

The Oxford descending pyramid technique uses the back half of the triangle pyramid method. The benefit of the Oxford method is that it allows the heaviest weight to be used on the first working set before the muscles are fatigued by previous working sets with lighter weight. With this descending pyramid technique, the first set is done with 100 percent of the 10RM to failure. Of course, this should be preceded by one or two light warm-up sets. On the second and third sets the weight is reduced just enough to allow you to complete 10 reps to failure. The Oxford seems to work well for gaining muscle mass because each set is done to muscle failure. Muscle failure is important for inducing muscle growth. The reason is that reaching muscle failure stimulates the release of growth hormone (GH) and insulin-like growth factor-I (IGF-I). Although the Oxford method is typically described using 10 reps per set, it can also be used with other rep ranges, such as 6, 8, 12, or even 15 reps per set. See table 6.22 (Oxford Mass) for a sample program using the Oxford descending pyramid technique. This can be followed for four to six weeks before switching to a different training method.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	3	**4**	5

Table 6.22 Oxford Mass

Exercise	Set	Weight	Reps (to failure)
MONDAY: CHEST AND TRICEPS			
Incline bench press	1	100% 10RM	10
	2	<100% 10RM*	10
	3	<100% 10RM	10
Dumbbell bench press	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Incline dumbbell fly	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Triceps pressdown	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Seated overhead triceps extension	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
TUESDAY: LEGS			
Front squat	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Leg press	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
TUESDAY: LEGS			
Leg extension	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Leg curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
THURSDAY: SHOULDERS			
Dumbbell shoulder press	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Lateral raise	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Bent-over lateral raise	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Dumbbell shrugs	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
FRIDAY: BACK AND BICEPS			
Lat pulldown	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

(continued)

Oxford Mass *(continued)*

Exercise	Set	Weight	Reps (to failure)
Dumbbell row	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Straight-arm pulldown	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Preacher curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Alternating dumbbell curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Reverse-grip curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

*On second and third sets of each exercise, reduce weight just enough to allow 10 reps to be completed.
Note: Abs can be done at the end of any of these workouts.

Breakdowns

This technique was devised by Fred Hatfield, PhD, and used successfully by professional bodybuilder Mike Quinn. It involves three distinct repetition ranges for each of the three total sets that are performed. Set 1 works with heavy weight (a weight that limits you to 4 to 6 reps per set to work the fast-twitch muscle fibers). Set 2 is performed using 15 to 20 percent less weight than with set 1. This should allow about 10 to 15 repetitions to be performed and enhances the biochemical milieu within the muscle cells to stimulate muscle growth. The last set, set 3, is performed with about 50 percent less weight than the first set, such that 25 to 30 reps are performed for training the slow-twitch muscle fibers. Rest periods between sets should be about 2 to 3 minutes. See table 6.23 for a sample breakdown workout for triceps.

Rating

Time	1	2	3	4	5
Length	1	2	3	4	5
Difficulty	1	2	3	4	5
Results	1	2	3	4	5

Table 6.23 Break Down to Build Up Triceps

Exercise	Weight (pounds)	Set number	Reps
Close-grip bench press	265	1	4
	215	2	12
	135	3	27
Lying triceps extension	135	1	6
	105	2	15
	65	3	30
Triceps pressdown	100	1	6
	80	2	12
	50	3	25

Drop-Set Training

Drop-set training involves an immediate reduction in the amount of weight being used so that you can continue to complete more reps for that given exercise. For example, if you can do 10 reps of barbell curls with 100 pounds on the bar, you would first complete 10 reps and then put the bar down to quickly strip off about 10 to 20 pounds. You immediately perform as many reps as possible with that weight before putting it down and stripping another 10 to 20 pounds off the bar and doing more reps. This can continue as many times as you like, although most bodybuilders do two or three drops per drop set. Regardless of how many drops are done per drop set, it is counted as only one set. Most bodybuilders perform about two or three drop sets per exercise. Choose two exercises per muscle group, usually one compound exercise and one isolation exercise, and do three drop sets for each. Another way to use drop-set training is to do the last set of every exercise as a drop set. Regardless of how you use it, it should be done infrequently so that overtraining does not develop.

The benefit of drop-set training is similar to that of forced-rep training in that it lets you push your muscles beyond their limits. Forcing the muscles to continue contracting with lighter weight will cause an elevated response of growth hormone and IGF-I. The trick is to keep the rest between drops to a minimum. It's a good idea to have a spotter help you strip the weight or use dumbbells for the quickest drops in weight. As with forced-rep training, when using drop-set training you should allow the trained muscle groups at least four and up to seven days of rest before training them again. Use drop-set training for no more than four weeks for any muscle group in order to avoid overtraining. See table 6.24 for a sample drop-set scheme for shoulder training using dumbbell presses and lateral raises. This is a good way to end a shoulder workout if it is preceded by shoulder presses and upright rows. Follow a similar plan for other muscle groups.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 6.24 Drop-It Delts

Set	Weight (pounds)	Reps	Rest
DUMBBELL PRESS			
1	65	10	None
	45	7	None
	30	5	2 min
2	65	9	None
	45	6	None
	30	4	2 min
3	60	10	None
	40	6	None
	30	3	
LATERAL RAISE			
1	35	12	None
	25	8	None
	15	7	2 min
2	30	12	None
	20	7	None
	10	6	2 min
3	30	10	None
	20	6	None
	10	4	

PROGRAMS THAT MANIPULATE REST PERIODS

Few bodybuilders realize that an effective way to alter training programs to keep their progress involves manipulating the rest periods between sets. This changes the biochemical adaptations the muscles undergo by altering the type of fuel (ATP, creatine phosphate, or glycogen) they rely on during sets and to recover with between sets. The chemicals produced from the use of different fuels can stimulate certain biochemical pathways involved in the process of muscle growth. The following programs change the rest periods between sets in an effort to stimulate muscle growth. This can be done by decreasing the rest between sets from workout to workout or by limiting the amount of rest between sets.

Rest Rundown

This is a program where rest time between sets is reduced by about 15 seconds every consecutive workout. The program starts with three-minute rest periods between sets and progressively drops to about 15 seconds over a 12-week period. The goal is to use the same weight for the same amount of reps each week. While that doesn't seem like progress when looking at the resistance used and the repetitions completed, it is remarkable progress when considering the drastic reductions in rest time. This trains the biochemical pathways in the muscle to allow the muscle to recover faster and allows for more reps to be performed with a given weight. The ability to do the same number of reps with the same weight with less rest time between sets translates to greater muscle growth. Stay at a rest range if you cannot complete reps in the minus 2 range. See table 6.25 for a sample weekly progression of the rest rundown program for an athlete who trains each body part once per week. Bodybuilders often use the rest rundown method to prepare for competition. This is believed to help with muscle definition and to decrease body fat because the workout is similar to an aerobic-type workout.

Rating

Time	1	2	3	4	5
Length	1	2	3	4	5
Difficulty	1	2	3	4	5
Results	1	2	3	4	5

Table 6.25 Rest Rundown

Week	Rest between sets
1	3 min
2	2 min 45 sec
3	2 min 30 sec
4	2 min 15 sec
5	2 min
6	1 min 45 sec
7	1 min 30 sec
8	1 min 15 sec
9	1 min
10	45 sec
11	30 sec
12	15 sec

Quality Training

Quality training is a system that keeps the rest periods between sets at 1 minute or less regardless of the exercise or weight used. Many bodybuilders swear by this technique for adding muscle mass and, therefore, always keep their rest periods under a minute regardless of how heavily they are training. From a physiological standpoint, there is some evidence to support the anecdotal reports. Keeping rest periods between sets to a minimum will cause lactate levels to reach fairly high levels. Since lactate levels are associated with GH levels, the GH response, as well as the IGF-1 response (which is associated with GH levels), would be higher with this type of training. See table 6.26 for a sample quality training workout for triceps.

Rating

Time	1	2	3	4	5
Length	1	2	3	4	5
Difficulty	1	2	3	4	5
Results	1	2	3	4	5

Table 6.26 Quality Training Workout for Triceps

Exercise	Sets	Reps	Rest between sets
Close-grip bench press	3	8-10	60 seconds
Triceps pressdown	3	8-12	30-45 seconds
One-arm overhead extension	3	10-15	As long as it takes to finish other arm

Power Circuit Training

This is a type of circuit training that involves the use of basic power movements with heavy weight. Typical circuit training involves the use of machines and very light weight. What they both have in common is that the goal is to move from one exercise to the next with no scheduled rest between exercises. Instead of doing several sets for an exercise, you would do only one set of an exercise before moving to a new exercise. In the end, you will complete several sets of each exercise after running through the circuit several times.

Power circuits are designed to increase strength and muscle size while helping decrease body fat. The continuous movement of circuit training keeps your metabolism high through the whole workout. Research studies show that keeping rest periods under 30 seconds burns the most calories regardless of how much weight is used and how many reps are performed. Research also suggests that fat use by the body after exercise is increased more with power circuits than with a traditional weightlifting program. With power circuits the lifter does about 30 total reps for each body part with a weight that is about 75 to 85 percent of the one-rep max (or a weight that could be lifted for 8 to 10 reps). With power circuits it is wise to use either a training partner who can watch the clock or a watch to monitor exercise time. Each exercise in the circuit is performed for 15 seconds. The goal is to complete as many reps as possible in those 15 seconds before moving on to the next exercise without resting. When a total of 30 reps have been completed for an exercise, the exercise is eliminated from the circuit and a 15-second rest period is set in its place on the following circuit rounds. For example, if you complete 17 reps on the first pass through the circuit and 13 the second time through, on your third trip through the circuit, instead of doing more calf raises, you would stop and rest for that 15 seconds before moving on to the next exercise.

The order of exercises in the circuit will affect the level of muscle fatigue that is reached during the power circuit. It is wise to alternate upper- and lower-body exercises to allow the muscles to recover and delay fatigue when doing power circuits. Whenever possible, push and pull exercises should be alternated as well. For instance, if the power circuit starts with a pulling exercise such as pull-downs and then moves to a lower-body exercise such as the leg press for the quads, the next upper-body exercise should then be a

pushing exercise such as the bench press, and the next lower-body exercise could be a leg curl for the hamstrings. Ideally, the power circuit should be completed in less than 25 minutes. Full-body power circuits can be done twice a week as long as at least two days of rest are allowed between workouts.

Rating					
Time	1	2	3	4	5
Length	1	2	3	4	5
Difficulty	1	2	3	4	5
Results	1	2	3	4	5

Table 6.27 Circuit Breaker

	Circuit I		Circuit II		Circuit III		Circuit IV	
Exercise	Time (seconds)	Reps*	Time (seconds)	Reps*	Time (seconds)	Reps*	Time (seconds)	Reps*
Bent-over row	15	8	15	8	15	8	15	6
Leg press	15	8	15	8	15	8	15	6
Bench press	15	8	15	8	15	8	15	6
Leg curl	15	10	15	8	15	6	15	6
Barbell curl	15	10	15	10	15	10	15	0
Standing calf raise	15	15	15	15	15	0	15	0
Standing military press	15	8	15	8	15	8	15	6
Back extension	15	10	15	8	15	6	15	6
Lying triceps extension	15	10	15	10	15	10	15	0
	Rest 2 min		Rest 2 min		Rest 2 min			

*Reps listed are a suggested goal; do as many as you can in 15 seconds, and do as many passes through the circuit as it takes to reach 30 reps total in each exercise.

Note: For all weighted exercises, use a weight equal to 75 percent to 85 percent of the 1RM (or a weight that normally can be lifted for 8 to 10 reps on that exercise). For example, if you can bench-press 200 pounds for 1 rep, in the circuit you should load the bar with 150 to 170 pounds.

PROGRAMS THAT MANIPULATE EXERCISE SELECTION

There are hundreds of strength training exercises that can be performed (see part IV for a complete listing of common strength training exercises). With so many exercises to choose from for each muscle group, it only makes sense that one way to design a training program is through manipulation of exercise choices. This can be done by changing the order of compound and isolation exercises for a given muscle group, making minute changes in the way exercises are performed (changes in grip or spacing of feet), limiting the workout to a specific type of equipment, or performing exercises that train only one side of the body. All such methods can be effective means of increasing your muscle size.

Preexhaust Training

This training method involves performing an isolation exercise before a multijoint exercise for that same muscle group. The point is to fatigue the muscle being trained with the isolation exercise so that it becomes the weak link in the multijoint exercise. For instance, an isolated muscle group such as the deltoids is fatigued (or preexhausted) with a single-joint exercise, such as the dumbbell lateral raise, before training it with a heavier, compound movement such as the dumbbell shoulder press. The reason for this is that the compound exercise involves the targeted muscle as well as at least one assistance muscle. During the shoulder press, the deltoids are assisted by the triceps. While this helps to lift more weight on the compound exercise, it can limit the muscle fatigue the targeted muscle receives. This is especially true if the assistance muscle is much weaker than the targeted muscle. If this is true, then often the exercise ends when the assistance muscle, not the targeted muscle, has fatigued.

Preexhaust works to fatigue the primary muscle group via the isolation exercise so that it can be further fatigued on the compound exercise that follows. Of course, the strength of the targeted muscle will be compromised on the second exercise. This prevents most bodybuilders from using the preexhaust method regularly, yet some use it specifically to limit the amount of weight they can use on the compound exercise. If a bodybuilder has an injury that is aggravated by a specific compound move, preexhaust training will limit the amount of weight he or she can use on the set and thus limit the overall stress placed on the injured muscle or joint. Preexhaust can be followed for four to six weeks or done for each body part once every four to six workouts. See table 6.28 for good exercise choices to pair up for preexhaust training. For a routine, do three sets of 10 to 15 reps on the first exercise and three sets of 6 to 10 reps on the second. Or to use this system as a compound set, do one set of 10 to 15 reps on the first exercise and immediately follow with one set of 6 to 10 reps on the second one. Rest about two to three minutes and repeat this process twice. Regardless of which method you choose, follow the preexhaust pairs with one other exercise for that muscle group done in straight-set fashion.

Rating

Time	1	2	3	4	5
Length	1	2	3	4	5
Difficulty	1	2	3	4	5
Results	1	2	3	4	5

Table 6.28 Sample Preexhaust Exercise Pairs

Muscle group	Isolation exercise	Multijoint exercise
Chest	Pec deck	Bench press
	Incline fly	Incline bench press
	Cable crossover	Decline bench press
Shoulders	Dumbbell lateral raise	Dumbbell shoulder press
	Front raise	Barbell shoulder press
Back	Straight-arm pulldown	Pull-down, pull-up, barbell row
Triceps	Triceps pressdown	Triceps dip
	Overhead extension	Close-grip bench press
Biceps	Preacher curl	Close-grip chin-up
Legs	Leg extension	Leg press
	Leg curl	Smith machine squat

Extended-Set Training

This is a unique method that uses several variations of one exercise. The variations of that exercise are ordered from hardest to easiest. An example of this can be explained using the dumbbell bench press. The hardest version of the dumbbell bench press is on an incline bench set between 30 and 45 degrees. Doing a dumbbell bench press on a flat bench is easier than doing an incline dumbbell bench press but harder than doing a decline dumbbell bench press. Thus, an example of extended-set training using the dumbbell bench press would be to do one set of incline dumbbell bench press followed immediately by one set of dumbbell bench press on a flat bench using the same amount of weight and finishing with one set of decline dumbbell bench press with the same weight. Because the rest time is minimal between each bench adjustment, these three exercises can be considered one extended set.

Each adjustment with extended-set training places the body in a position that is stronger than the previous position. This makes the weight easier to lift on each successive position change, allowing you to continue doing more reps, when normally you would have failed if your body position had not changed. Not only does this allow you to train with more intensity, but the change in body position also increases the number of muscle fibers targeted in each specific muscle group.

To follow extended-set training, first choose a weight that normally limits you to four or five reps on the first exercise (even though you will attempt no more than four reps). For each change in exercise movement for that extended set, you will attempt two to four reps. Do not do more than four reps on any exercise except on the final movement of the extended set. You can work to failure on the last exercise of all extended sets. If you have three or four exercise changes per extended set, you will have a total of about 7 to 16 reps. So in essence, you are using a weight on each movement that is best for strength gains, but at the end of the extended set the total reps that the muscle group has performed fall in the range that is optimal for muscle growth.

The first exercise movement should be the exercise that your body is weakest at compared to all other exercises in the extended set. Each successive exercise movement in the extended set should be one that your body is stronger at compared to the previous exercise yet weaker than the one that follows. Rest time between sets will always be minimal but can be varied depending on the biomechanical advantage gained in the proceeding set. Some exercises will be dramatically easier than the previous one; for these, rest should involve changing only your body position. Some exercises provide a minimal biomechanical advantage; for these you may rest up to 15 seconds before performing. Rest between extended sets for three to four minutes. Perform between one and three sets for each extended set, depending on the number of exercise movements used in the extended set and the number of years training experience you have.

This is an extremely advanced training technique because it involves heavy weight with very little rest. These two training techniques are usually at opposition to one another, meaning you either train heavy or fast, but rarely ever both—until now.

For most bodybuilders, doing one extended set will suffice. This will depend on the amount of exercise movements you include in each extended set as well as your training experience. Some extended sets involve as few as two different movements (such as with shrugs), while some include as many as nine (such as with the ultimate biceps extended set). See examples of extended sets in table 6.29. The more exercise movements per extended set, the fewer total extended sets you will need. Most lifters will need about two or three extended sets for the trap workout, while many will struggle to finish one ultimate biceps extended set.

You can incorporate extended sets into your training in a number of ways. You can do one extended set per muscle group along with other straight sets for that muscle group. You can do one giant extended set per muscle group. Or you can choose two different extended sets for each muscle group—as long as they complement each other and do not mimic exercise movements. Follow extended-set training for about 4 to 6 weeks, and follow it with a training program that incorporates standard sets and higher reps such as the finish pump method or triangle training method. Do not return to extended-set training for at least 12 weeks. There are several reasons for this. The first is the intensity factor, as described previously. Using

this technique for too long will tax your body and push you into overtraining. The other problem is exercise order. With this style of training, many of the basic movements are trained toward the end of the extended set. This is the reverse order of a typical bodybuilding workout.

Rating

Time	1	2	3	**4**	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 6.29 Extended Gains

Muscle group	Exercise	Variations
Chest	Dumbbell fly	1. Incline fly: 3-4 reps Rest only long enough to adjust bench. 2. Flat fly: 2-4 reps Rest only long enough to adjust bench. 3. Decline fly: 2-4 reps
	Dumbbell press	1. Incline press: 3-4 reps Rest only long enough to adjust bench. 2. Flat press: 2-4 reps Rest only long enough to adjust bench. 3. Decline press: 2-4 reps
	Cable crossover	1. Cable crossover from low pulley: 3-4 reps Rest only long enough to change pulley. 2. Cable crossover from high pulley: 2-4 reps Immediately switch to cable press with no rest. 3. Cable chest press: 2-4 reps
	Barbell bench press	1. Bench press to neck: 3-4 reps Immediately switch movement without rest. 2. Bench press to nipple: 2-4 reps Rest only long enough to rack the bar and change body position. 3. Bench press to lower chest (feet on bench, butt up and off of bench)
Ultimate declining extended set for chest: Do both the dumbbell fly and dumbbell press extended sets in succession with the same weight.		
Back	Pulldown and pull-up	1. Behind-the-neck pulldown or pull-up: 3-4 reps Immediately bring bar to front of head and continue. 2. Wide-grip pulldown or pull-up to front: 2-4 reps Rest for only 15 seconds. 3. Close-grip pulldown or pull-up to front: 2-4 reps Rest just long enough to switch grip. 4. Reverse-grip pulldown or chin-up: 2-4 reps
	Row (barbell or seated cable)	1. Wide-grip (beyond shoulder width) row: 3-4 reps Rest for 15 seconds. 2. Close-grip (shoulder width) or neutral-grip row: 2-4 reps Rest just long enough to switch grip or handle. 3. Underhand-grip row: 2-4 reps
Shoulders	Barbell	1. Wide-grip upright row: 3-4 reps Rest only long enough to rack the bar and change body position. 2. Behind-the-neck press: 2-4 reps Immediately switch to presses in front of neck. 3. Front press: 2-4 reps

(continued)

Extended Gains *(continued)*

Muscle group	Exercise	Variations
Shoulders *(continued)*	Dumbbell lateral raise	1. Lateral raise with straight arms and dumbbells at your sides: 3-4 reps Immediately go into next movement with no rest. 2. Lateral raise with straight arms and dumbbells in front of your thighs: 2-4 reps Immediately go into next movement with no rest. 3. Lateral raise with arms bent 90 degrees at elbows
	Complete dumbbell delt workout	1. Bent-over laterals: 3-4 reps Immediately go into next movement with no rest. 2. Front raise: 2-4 reps Immediately go into next movement with no rest. 3. Lateral raise: 2-4 reps Immediately go into next movement with no rest. 4. Dumbbell upright row: 2-4 reps Immediately go into next movement with no rest. 5. Standing dumbbell press: 2-4 reps
Traps	Barbell shrug	1. Behind-the-back barbell shrug: 3-4 reps Rest only long enough to change body position and grip. 2. Barbell shrug: 2-4 reps
Legs	Squat	1. Front squat narrow stance (feet hip width or closer): 3-4 reps Do not rack the weight; just adjust your stance and immediately continue. 2. Front squat wide stance (feet wider than shoulder width): 2-4 reps Rack the weight and rest just long enough to switch the bar position. 3. Back squat narrow stance: 2-4 reps Do not rack the weight; just adjust your stance and immediately continue. 4. Back squat wide stance: 2-4 reps
	Leg press	1. Single leg press: 3-4 reps each leg Rack the sled and rest for just 15 seconds. 2. Feet together: 2-4 reps Rack the sled just long enough to change foot position. 3. Feet wide (beyond shoulder width): 2-4 reps
Biceps	Reverse-grip dumbbell curl	1. Incline (~45 degrees) reverse-grip dumbbell curl: 3-4 reps 2. Seated reverse-grip dumbbell curl: 2-4 reps 3. Standing reverse-grip dumbbell curl: 2-4 reps Perform all 3 movements in succession with no rest and without putting down the dumbbells.
	Dumbbell curl	1. Incline (~45 degrees) dumbbell curl: 3-4 reps 2. Seated dumbbell curl: 2-4 reps 3. Standing dumbbell curl: 2-4 reps Perform all 3 movements in succession with no rest and without putting down the dumbbells.
	Hammer curl	1. Incline (~45 degrees) hammer curl: 3-4 reps 2. Seated hammer curl: 2-4 reps 3. Standing hammer curl: 2-4 reps Perform all 3 movements in succession with no rest and without putting down the dumbbells.

Muscle group	Exercise	Variations
Biceps *(continued)*	Barbell curl	1. Reverse-grip curl: 3-4 reps Rest just long enough to switch grip. 2. Wide-grip (2-4 inches beyond shoulder width) curl: 2-4 reps Rest for 15 seconds. 3. Close-grip (hip width) curl: 2-4 reps
Ultimate biceps extended set: Do all three dumbbell extended sets with just 15 seconds of a break between each.		
Triceps	Lying triceps extension	1. Lying extension to forehead: 3-4 reps Without rest, go into next movement. 2. Lying extension to nose: 2-4 reps Without rest, go into next movement. 3. Lying extension to chin (allow elbows to flare out): 2-4 reps Without rest, go into next movement. 4. Close-grip bench press: 2-4 reps
	Triceps pressdown	1. Reverse-grip pressdown: 3-4 reps Rest only long enough to switch grip and body position. 2. Overhead extension (from high pulley): 2-4 reps Rest only long enough to switch grip and body position. 3. Pressdown: 2-4 reps
Abs	Lower abs	1. Hanging leg raise: ~10-15 reps Without rest, go into hanging knee raise. 2. Hanging knee raise: ~5-10 reps Rest only long enough to get into position. 3. Reverse crunch straight legs: ~10-15 reps Without rest, switch to bent legs. 4. Reverse crunch bent legs ~5-10 reps
	Upper abs	1. Decline bench crunch: ~10-15 reps Rest only long enough to switch body position. 2. Crunch: ~10-15 reps Rest only long enough to get into position. 3. Standing cable crunch: ~10-15 reps Rest only long enough to switch body position. 4. Kneeling cable crunch: ~10-15 reps
Because abs are a unique muscle group when it comes to resistance training, reps for abdominal extended sets will typically be much higher than the rep range used for the other muscle groups. As with the other muscle groups, perform each ab movement close to failure.		

Small-Angle Training

Small-angle training is similar to extended set in concept. It uses multiple variations of a single exercise to ensure that all muscle fibers in a muscle are adequately trained.

To understand the concept of exercise angles, you need to know the basic structure of muscle. One important but surprising fact is that individual muscle fibers rarely run the entire length of the muscle. Muscles are actually composed of a sequence of one- to four-inch (two-and-a-half- to ten-centimeter) segments of muscle fiber linked together. For that reason, you can't think of muscle fibers as being synonymous with the actual muscle. This is critical, as the growth of each muscle fiber depends on whether it is actually stimulated during a particular exercise. In many cases, muscle fibers remain unused and just go along for the ride during a lifting movement. Whether the fiber is used depends not only on the amount of resistance but also on the angle of the exercise and the specific range of motion used in the exercise. If the angle (such as in the flat bench press versus incline bench press) and the range of motion (such as partial movements versus full range of motion) do not call a specific muscle fiber into action, no growth will occur in that fiber. To make sure you hit each muscle fiber and stimulate it to grow, you have to use a variety of exercises. And even for a given exercise, you must use variety. For example, on dumbbell bench presses, you can adjust the angle of the bench from a 30-degree decline to a 45-degree incline in as many increments as the benches will allow.

See table 6.30 for a sample small-angle training program. This program capitalizes on minute changes in the angles used to work the major muscle groups. Train each muscle group only once per week.

Rating

Time	1	2	3	4	**5**
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	4	**5**

Table 6.30 Small-Angle Workout

WORKOUT 1 CHEST			
Exercise	**Set number**	**Reps**	**Exercise specifics**
Flat bench press*	Warm-up	10	Shoulder-width grip
	Warm-up	10	6-8 inches beyond shoulder-width grip
	1	6-8	Natural grip (most comfortable grip)
	2	6-8	Shoulder-width grip
	3	6-8	2 inches beyond shoulder-width grip
	4	4-8	4 inches beyond shoulder-width grip
	5	4-8	6 inches beyond shoulder-width grip
	6	4-8	8 inches beyond shoulder-width grip
*As an alternative, perform the incline bench press with the same grip progression.			
Dumbbell fly	1	8-10	45- to 60-degree decline
	2	8-10	15- to 30-degree decline
	3	8-10	Flat
	4	6-10	15- to 30-degree incline
	5	6-10	45-degree incline
As an alternative to flys, try this cable crossover progression:			
Cable crossover	1	8-10	From bottom position
	2	8-10	Halfway between bottom and shoulder height
	3	8-10	Shoulder height
	4	8-10	From top pulley

TRICEPS			
Exercise	**Set number**	**Reps**	**Exercise specifics**
Extension or pressdown	Warm-up	10	Seated overhead extension (with dumbbell)
	Warm-up	10	Seated pressdown
	1	8-10	Seated overhead extension (with dumbbell)
	2	6-8	Seated overhead extension (with dumbbell)
	3	8-10	Lying triceps extension over top of head (arms angled at 45 degrees)
	4	8-10	Lying triceps extension to forehead
	5	8-10	Pressdown with torso bent slightly forward
	6	8-10	Pressdown with upright torso (rope handle)
	7	6-8	Pressdown with upright torso (straight bar)
Dip	1	6-10	Parallel bars
	2	6-10	Bench
ABS			
Hanging knee raise to sides	1	15-20	
Hanging knee raise	2	15-20	
Decline bench crunch	3	15-20	
V-up	4	15-20	
Oblique crunch	5	15-20	
Crunch	6	15-20	
Perform all exercises with minimal rest between sets.			

WORKOUT 2

BACK			
Cable pulldown or row	Warm-up	10	Pulldown behind neck
	Warm-up	10	Pulldown to upper chest
	1	8-10	Pulldown behind neck
	2	8-10	Pulldown to upper chest, wide grip
	3	6-10	Pulldown to upper chest, narrow grip
	4	6-8	Hammer front pulldown or standing row from high pulley
	5	6-8	Standing row from pulley (chest level) or seated row
	6	6-8	Standing row from low pulley
Barbell row	Warm-up	10	Natural grip (most comfortable grip)
	1	6-8	Natural grip
	2	6-8	8 inches beyond shoulder-width grip
	3	6-8	6 inches beyond shoulder-width grip
	4	6-8	4 inches beyond shoulder-width grip
	5	6-8	2 inches beyond shoulder-width grip
	6	6-8	Shoulder-width grip
BICEPS			
Curl	Warm-up	10	Supine curl
	Warm-up	10	Standing curl
	1	8-10	Supine curl
	2	8-10	15-degree incline curl

(continued)

Small-Angle Workout *(continued)*

BICEPS *(continued)*			
Exercise	**Set number**	**Reps**	**Exercise specifics**
Curl *(continued)*	3	8-10	30-degree incline curl
	4	8-10	45-degree incline curl
	5	8-10	60-degree incline curl
	6	8-10	75-degree incline curl
	7	8-10	Standing dumbbell alternating curl
	8	8-10	Preacher curl
	9	8-10	Scott curl
	10	8-10	Overhead curl (on cable pulldown machine)
As an alternative way to hit biceps, try this barbell curl progression:			
Barbell curl	Warm-up	10	Wide grip
	Warm-up	10	Shoulder-width grip
	1	8-10	Natural grip (most comfortable grip)
	2	8-10	6 inches beyond shoulder-width grip
	3	6-10	4 inches beyond shoulder-width grip
	4	6-10	2 inches beyond shoulder-width grip
	5	6-10	Shoulder-width grip
	6	6-10	Narrow grip (hands about 4 inches apart)
WORKOUT 3			
SHOULDERS			
Dumbbell press	Warm-up set	10	Arnold press
	Warm-up set	10	Palms facing forward
	1	6-8	Arnold press
	2	6-8	Neutral grip
	3	6-8	Palms facing forward
	4	4-8	Palms facing forward
Dumbbell raise	1	8-10	Front raise (with neutral grip) (perform one arm at a time)
	2	8-10	45-degree front raise*
	3	8-10	Lateral raise
	4	8-10	Lateral raise
	5	8-10	30-degree rear raise**
	6	8-10	Bent-over lateral raise
	7	8-10	Bent-over lateral raise
*Perform similar to lateral raise, but raise arm to a point halfway between front raise and lateral raise. **Perform similar to lateral raise, but raise arm to a point 30 degrees behind lateral raise.			
ABS			
Hanging knee raise	1	15-20	
Decline bench crossover crunch	2	15-20	
Decline bench crunch	3	15-20	
Exercise-ball pull-in	4	15-20	
Reverse crunch	5	15-20	
Crossover crunch	6	15-20	
Perform all exercises with minimal rest between sets.			

WORKOUT 4
LEGS

Exercise	Set number	Reps	Exercise specifics
Squat*	Warm-up	10	Wide stance
	Warm-up	10	Narrow stance
	1	6-10	Shoulder-width stance
	2	6-10	Shoulder-width stance
	3	6-10	Hip-width stance
	4	6-10	4 inches wider than hip-width stance
	5	6-10	6 inches wider than hip-width stance
	6	6-10	8 inches wider than hip-width stance
	7	6-10	10 inches wider than hip-width stance
	8	6-10	12 inches wider than hip-width stance
*As an alternative, perform on leg press or hack squat (though you may be limited by the width of the foot plate). As an alternative to the squat, leg press, or hack squat, try this lunge progression:			
Lunge	1	10-15	Forward lunge
	2	10-15	45-degree side lunge*
	3	6-10	Side lunge
	4	6-10	45-degree reverse lunge**
	5	6-10	Reverse lunge
*Perform as a cross between a forward lunge and a side lunge. Your foot should land halfway between both points. **Perform as a cross between the side lunge and the reverse lunge. Your foot should land halfway between the side lunge and the reverse lunge.			
Leg extension	1	10-12	Toes straight up
	2	10-12	Toes straight up
	3	8-12	Toes turned out
	4	8-12	Toes turned in
Stiff-leg deadlift	1-3	10-12	Bring barbell just past knees
Lying leg curl*	1	10-12	Toes straight down
	2	10-12	Toes turned in
	3	8-12	Toes turned out
*As an alternative, perform on a seated or standing leg curl machine.			
Standing calf raise*	1	10-15	Toes straight forward
	2	10-15	Toes turned out
	3	10-15	Toes turned in
*As an alternative, perform on a leg press, donkey calf machine, or calf slide machine.			
Seated calf raise	1	10-15	Toes straight forward
	2	10-15	Toes turned out
	3	8-15	Toes turned in

Note: 1 inch = 2.54 centimeters

Barbell Blasting

The purpose of this training method is to limit all exercise choices to the barbell and use a variety of barbell exercises to stimulate each muscle group from a variety of angles. This serves as a good way to mix up your training for a short while and get creative with the exercises you can perform with a barbell. It's also great if you train at home and do not own dumbbells.

One way to do barbell blasting is by performing all exercises in a power rack, which will save time and provide safety, especially for those who train alone. See table 6.31 for a sample barbell blast program that hits each major muscle group using a three-day training split. This program can be done once or twice per week. Regardless of the frequency, follow it for no more than three weeks straight before switching to a program that offers more variety of exercises. You can also use barbell blasting by throwing it into a workout here or there for some sporadic variety or when the gym is crowded and not much else is available besides a barbell and a power rack.

Rating

Time	1	2	**3**	4	5
Length	1	2	3	**4**	5
Difficulty	1	**2**	3	4	5
Results	1	2	**3**	4	5

Table 6.31 Have a Blast

WORKOUT 1: CHEST AND TRICEPS		
Exercise	**Sets**	**Reps**
Incline barbell bench press (shoulder-width grip)	2	8-10
Incline barbell bench press (wide grip)	2	8-10
Decline barbell bench press	3	6-8
Flat barbell bench press	3	6-8
Reverse-grip barbell bench press	2	8-10
Close-grip barbell bench press	2	6-8
Seated barbell triceps extension	2	10-12
Skull crusher	2	8-10
WORKOUT 2: LEGS, SHOULDERS, TRAPS		
Barbell front squat	3	8-10
Barbell back squat	3	6-8
Barbell hack squat	3	6-8
Barbell lunge	3	8-10
Barbell Romanian deadlift	3	10-12
Barbell standing calf raise	3	10-12
Barbell seated calf raise	3	15-20
Standing barbell shoulder press	3	8-10

WORKOUT 2 *(continued)*		
Exercise	**Sets**	**Reps**
Barbell front raise	3	10-12
Barbell upright row (wide grip)	3	8-10
Barbell upright row (close grip)	3	8-10
Barbell shrug	2	6-8
Barbell behind-the-back shrug	2	8-10
WORKOUT 3: BACK, BICEPS, FOREARMS		
Barbell bent-over row (overhand shoulder-width grip)	3	8-10
Barbell bent-over row (overhand wide grip)	3	8-10
Barbell bent-over row (underhand grip)	3	8-10
Barbell decline bench pullover	3	10-12
Barbell curl	3	8-10
Barbell incline bench spider curl	3	10-12
Barbell preacher curl	3	10-12
Barbell reverse-grip curl	2	10-12
Barbell wrist curl	2	10-12
Barbell reverse wrist curl	2	10-12

One-Sided Training

This method of training uses exercises that focus on just one side of the body. This is known as unilateral training. Most training programs neglect unilateral training; at best, some include a one-arm or one-leg exercise here or there, such as the concentration curl or one-leg leg press. This can lead to imbalances in muscle strength and development.

Research shows that you can produce more force on each side of the body when you perform unilateral exercises than you could produce during bilateral exercises, such as the barbell bench press. In addition, because there are crossover effects from training a muscle on one side of the body, one-sided training can encourage better muscle growth on the untrained side. That is, the resting side also receives nervous stimulation from the increased blood flow that is caused by exercising the muscles on the other side of the body. This enhances the delivery of oxygen, nutrients, and hormones to the resting muscles while helping to flush away waste products from the previous workouts. The result may be better muscle regeneration and growth of the muscles.

Another benefit of one-sided training is that it trains the core muscles (the visible and deep muscles of the abdomen and low back) that are important for a better overall strength base. Perhaps the best point about one-sided training, however, is the pure novelty of the stimulus that it places on the body. It stimulates the nervous system and muscle fibers in a more unique way than any other training programs. New stimuli may lead to gains in muscle mass and muscle strength.

One-sided training breaks up workouts into right-side and left-side training days. In other words, muscles on the left side of the body (such as biceps and triceps) are trained on one day, and the same muscles on the right side of the body are trained on a different day. The program (shown in table 6.32) consists of four workouts per week that train the entire body once. Workout 1 consists of the right chest, shoulder, traps, triceps, back, and biceps. Workout 2 consists of the left chest, shoulder, traps, triceps, back, and biceps. On workout 3 you would hit the right quad, hams, and calves. Workout 4 closes out the body with the left quad, hams, and calves. Abs can be trained at the end of the first and fourth workout.

The volume of work performed per muscle group is fairly low (two exercises per muscle group for two or three sets per exercise) because this type of training is somewhat shocking on the nervous system. The weight used should be light enough to allow for 10 to 12 reps per set. Follow the one-sided training for only two to four weeks before switching back to normal bilateral training, and do not revisit this alternative training style more than once every four to six months.

In addition to the exercises given in the sample workouts, there are many other unilateral exercises you can perform for each muscle group. Table 6.33 contains a list of options you can try.

Rating

Time	1	2	3	**4**	5
Length	1	2	**3**	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	**3**	4	5

Table 6.32 Side-by-Side Training

Muscle group	Exercise	Sets	Reps
WORKOUT 1: RIGHT UPPER BODY (CHEST, SHOULDERS, TRAPS, TRICEPS, BACK, BICEPS)			
Chest	One-arm dumbbell chest press	3	10
	One-arm cable fly	3	12
Shoulder	One-arm dumbbell shoulder press	3	10
	One-arm cable lateral raise	3	12
Trapezius	One-arm Smith machine shrug	3	10
Triceps	Dumbbell kickback	2	12
	One-arm overhead triceps extension	2	12
Back	Dumbbell row	3	10
	One-arm pulldown	3	12
Biceps	One-arm preacher curl	2	12
	Dumbbell concentration curl	2	12
WORKOUT 2: LEFT UPPER BODY (CHEST, SHOULDERS, TRAPS, TRICEPS, BACK, BICEPS)			
Chest	One-arm dumbbell chest press	3	10
	One-arm cable fly	3	12
Shoulder	One-arm dumbbell shoulder press	3	10
	One-arm cable lateral raise	3	12
Trapezius	One-arm Smith machine shrug	3	10
Triceps	Dumbbell kickback	2	12
	One-arm overhead triceps extension	2	12
Back	Dumbbell row	3	10
	One-arm pulldown	3	12
Biceps	One-arm preacher curl	2	12
	Dumbbell concentration curl	2	12
WORKOUT 3: RIGHT LOWER BODY (QUADS, HAMSTRINGS, GLUTES, CALVES)			
Legs	One-leg leg press	3	10
	One-leg leg extension	3	12
	One-leg Romanian deadlift	3	10
	One-leg leg curl	3	12
	One-leg calf raise on leg press	2	12
	One-leg seated calf raise	2	12
WORKOUT 4: LEFT LOWER BODY (QUADS, HAMSTRINGS, GLUTES, CALVES)			
Legs	One-leg leg press	3	10
	One-leg leg extension	3	12
	One-leg Romanian deadlift	3	10
	One-leg leg curl	3	12
	One-leg calf raise on leg press	2	12
	One-leg seated calf raise	2	12

Table 6.33 Exercises on the Side

Muscle group	Exercises
Chest	One-arm dumbbell incline press
	One-arm dumbbell decline press
	One-arm dumbbell fly (flat, incline, decline)
	One-arm cable crossover
Shoulders	One-arm front raise (dumbbell or cable)
	One-arm dumbbell lateral raise
	One-arm bent-over lateral raise (dumbbell or cable)
	One-arm dumbbell upright row
Traps	One-arm dumbbell shrug
Triceps	Cable kickback
	One-arm triceps pressdown (D-handle or rope)
	One-arm lying triceps extension
Back	One-arm seated row
	One-arm straight-arm pulldown
	One-arm straight-arm kickback
Biceps	Cable concentration curl
	One-arm dumbbell curl (seated, incline, standing)
	One-arm cable curl from high pulley
Quads	Step up
	Lunge
	Squat

PROGRAMS THAT MANIPULATE TRAINING FREQUENCY

The standard training method for making sound gains in muscle size is to allow a minimum of 48 hours between training sessions for a particular muscle group. This time period allows the processes of muscle recovery to kick in so that the muscle damage inflicted in the previous workout can be repaired and the depleted fuel stores can be replenished. However, on occasion, going against conventional thinking on recovery can be an advantage for making muscle gains. This can be done by training similar muscle groups on consecutive days or even training them twice in one day. Increasing the frequency of training for short periods can lead to more frequent muscle growth.

Back-to-Back Training

Back-to-back training refers to training a muscle group on two consecutive days. It is also referred to in some bodybuilding circles as feeder workouts, because the concept is to train the muscle group again the very next day but with very light weight, higher reps, fewer sets, and very low intensity to help increase blood flow to the muscle tissue. The theory is that this will supply the recovering muscle cells with more nutrients such as amino acids and glucose (both critical for muscle growth and strength), anabolic hormones such as GH and testosterone, and more oxygen for faster recovery. It will also help remove the waste products and cellular debris that were created from the previous workout. It also leads to greater water flow from the blood supply into the muscle—this is the cause of the pump—which is believed to turn on muscle-building pathways because of the stretch that is placed on the muscle cell by the volume overload. While no studies have looked at this effect on muscle growth directly, one study found that the cortisol response on the second workout day is significantly lower and the testosterone levels are slightly higher. This means that a greater anabolic environment is created within the muscles, which can enhance the potential for muscle growth and strength gains.

The first back-to-back workout for each muscle group should be very intense. Muscle failure should be reached on all sets and followed with forced reps or drop sets. Volume should also be high (12 to 16 sets per muscle group) to ensure the muscle is thoroughly fatigued. The second workout should be lower in both intensity and volume. Perform only about six to eight sets per muscle group and perform 15 to 20 reps, never reaching muscle

failure. See table 6.34 for a sample back-to-back workout program.

Back-to-back training should be done only on occasion, about once every 3 to 4 months per muscle group. Although any muscle group can be trained in this manner, it is not wise to train all muscle groups with it at the same time. Allow a minimum of one week between back-to-back sessions for different muscle groups.

Rating

Time	1	2	3	**4**	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	**3**	4	5

Table 6.34 Back-to-Back Back Attack

Workouts 1 and 2 are performed on two consecutive days.

WORKOUT 1		
Exercise	**Sets**	**Reps**
Pull-up	3	6-10*
Barbell row	4	6-10**
Seated cable row	4	6-10**
Pulldown (underhand grip)	4	6-10**
WORKOUT 2		
Pulldown (wide grip)	2	15-20
Barbell row	2	15-20
Seated cable row	1	15-20
Pulldown (underhand grip)	1	15-20

*Perform two or three forced reps at the end of each set.

**Perform each set to failure. At the end of last set, strip the weight down by about 30 percent and perform as many reps as possible. Then strip another 30 percent or so off and perform reps until muscle failure is reached.

Twice-a-Day Training

Similar to back-to-back training, twice-a-day training works the same muscle group back to back, just on the same day. The program is based on research that shows that when muscles are trained twice in the same day, the amount of muscle glycogen increases by nearly double the normal value. Since glycogen pulls water into muscle cells, the muscle cells become fuller (more pumped). This causes a stretch on the muscle cells that is believed to trigger muscle growth.

Twice-a-day training also encourages capillary growth in muscle tissue and increases the density of fuel-metabolizing mitochondria in the muscle cells, both of which help the muscle to assimilate nutrients. It also works to boost resting metabolism after the twice-a-day workouts, which can help to encourage fat loss during cutting phases of training.

With twice-a-day training the same exercises should be done for both workouts. This is because different exercises stress different muscle fibers, and it is essential to stress the same muscle fibers in the second workout as were stressed in the first. However, the order of these exercises is not critical. So some bodybuilders begin the first workout with compound movement and then finish with isolation exercises. In the second workout they reverse that order. This helps to prevent boredom. Repetitions for both workouts should be high (in the range of 12 to 20) to prevent overstressing the targeted muscle group and better deplete muscle glycogen. Rest should be no more than 60 seconds between sets to best deplete glycogen stores, increase caloric expenditure, and facilitate fat loss.

Workouts should be separated by at least three but no more than eight hours of rest. If there is not enough time between sessions, the testosterone response that occurs from training may be blunted, and cortisol levels may increase too much. Muscles should receive about three to seven days of recovery before you train them again. Use the twice-a-day program for no more than six weeks, because using it any longer may actually hinder progress. See table 6.35 for sample twice-a-day workouts.

Rating

Time	1	2	3	4	**5**
Length	1	**2**	3	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	3	4	**5**

Table 6.35 Twice the Workout

CHEST WORKOUT 1		
Exercise	Sets	Reps
Incline barbell press	3	12-15
Dumbbell bench press	3	12-15
Incline dumbbell fly	3	15
CHEST WORKOUT 2		
Incline dumbbell fly	3	15
Dumbbell bench press	3	12-15
Incline barbell press	3	12-15
SHOULDER WORKOUT 1		
Dumbbell shoulder press	3	12-15
Wide-grip upright row	3	12-15
Dumbbell lateral raise	3	15
SHOULDER WORKOUT 2		
Dumbbell lateral raise	3	15
Wide-grip upright row	3	12-15
Dumbbell shoulder press	3	12-15
BACK WORKOUT 1		
Barbell row	3	12-15
Wide-grip pulldown	3	12-15
Straight-arm pulldown	3	15
BACK WORKOUT 2		
Straight-arm pulldown	3	15
Wide-grip pulldown	3	12-15
Barbell row	3	12-15
LEG WORKOUT 1		
Squat	3	15-20
Leg press	3	15-20
LEG WORKOUT 1 *(continued)*		
Leg extension	3	15-20
Lying leg curl	3	15-20
Standing calf raise	3	20
Seated calf raise	3	20
LEG WORKOUT 2		
Lying leg curl	3	15-20
Leg extension	3	15-20
Leg press	3	15-20
Squat	3	15-20
Seated calf raise	3	20
Standing calf raise	3	20
BICEPS WORKOUT 1		
Barbell curl	2	12-15
Seated incline curl	2	12-15
Concentration curl	2	15
BICEPS WORKOUT 2		
Concentration curl	2	15
Seated incline curl	2	12-15
Barbell curl	2	12-15
TRICEPS WORKOUT 1		
Close-grip bench press	2	12-15
Skull crusher	2	12-15
Triceps pressdown	2	15
TRICEPS WORKOUT 2		
Triceps pressdown	2	15
Skull crusher	2	12-15
Close-grip bench press	2	12-15

CHAPTER 7

Training Cycles for Building Muscle Mass

Once you are familiar with the fundamentals of strength training, including the basic guidelines on designing a training program for building muscle mass as well as having an arsenal of advanced mass-training techniques, it's time to consider the long-term application of your training program. Being able to put this acquired knowledge together in a long-term program is the only way of reaching your desired goals. Whether you're a beginner, intermediate, or advanced weightlifter and just want to add general muscle mass to your frame, or you want to shed body fat while adding muscle, or you have specific muscle groups you want to focus on building up, this chapter has a program for you.

MASS-BUILDING PROGRAMS

Although it is well established that certain exercise choices, orders of exercises, volumes, resistances, and amounts of rest between sets are better than others for developing muscle mass, sticking within those guidelines for too long can actually hinder your progress. This is the foundation of periodization (covered in chapter 3). For instance, although the repetition maximum continuum indicates that using a range of 6 to 12 reps per set is best for muscle hypertrophy, sticking within those confines will lead to stagnation in muscle growth. Therefore, while the majority of your training should be done with this rep range, you also need to occasionally work in both lower- and higher-rep ranges. The question, then, is how and when to do this. This rationale also applies to the other acute variables of training. To ensure that gains in muscle mass are optimized and persistent, smart bodybuilders realize that the frequent cycling of their workouts is as essential to their progress as the acute variables.

Developing a basic cycle that carries your training over the next 6 months or year is much like an insurance policy that protects your progress. This template will serve as a basic guide to steer you through your journey to gain more muscle. If you are a beginner, you should follow this program as prescribed for your first 6 months of serious training. The intermediate (6 to 12 months of training experience) and advanced (over a year of consistent training experience) weightlifters are provided a yearlong training guide. However, at this level you can take a few side roads here or there as long as you mind the overall scheme of the program. In the end, remember that everything works, but nothing works forever.

Beginner Program (First Six Months)

This six-month program breaks down into six four-week segments. In the first three segments, you follow a whole-body training split and train with weights three days per week, working your entire body each time. The first four weeks you will train one exercise per muscle group. The exercises are the same for each workout and the reps are 15 per set with two- to three-minute rest periods between sets. This helps to train the nervous system during this introductory phase. The second four-week cycle adds a second exercise to each muscle group to increase both volume and variety in the way the muscles are trained. Exercises performed are the same for each workout and reps are 12 to 15 per

set with two- to three-minute rest periods. The third four-week cycle changes the exercises at each different workout for the week. This provides three different exercises per muscle group at the end of the week in an effort to target all the muscle fibers in each muscle group. For example, chest exercises include flat bench press, incline dumbbell fly, and decline dumbbell press to hit muscle fibers of the lower, middle, and upper pecs. The exercises per muscle group drop back to just one per workout but increase in number of sets. Reps drop down to 10 to 12, while rest periods remain the same at two to three minutes between sets.

In the last three segments, you'll train with a two-day training split for a total of four workouts per week. During the first four weeks exercises will be the same for each muscle group on the two workouts that are done each week. Most major muscle groups will be trained with three exercises for a total of six sets per muscle group. The exceptions are legs, which will be trained with four exercises, and the smaller muscle groups like biceps and triceps are trained with only two exercises per workout. During the second four-week cycle, exercises drop back to about two per major muscle group, but the sets increase to three per exercise. Rest period during this entire phase drops down to one to two minutes between sets. Each muscle group is trained with different exercises on the different workout days. During the last four-week cycle the exercises increase to about three for most major muscle groups, as do the sets for most (three per exercise). After this phase is completed, you can graduate to the intermediate program.

Table 7.1 Beginner Basic Program

WEEKS 1-4: MONDAY, WEDNESDAY, FRIDAY		
Exercise	**Sets**	**Reps**
Leg press	3	15
Bench press	3	15
Seated cable row	3	15
Dumbbell shoulder press	3	15
Barbell curl	3	15
Triceps pressdown	3	15
Standing calf raise	3	15
Crunch	3	15
WEEKS 5-8: MONDAY, WEDNESDAY, FRIDAY		
Leg press	2	12-15
Lunge	2	15
Bench press	2	12-15
Dumbbell incline fly	2	15
Seated cable row	2	12-15
Lat pulldown	2	15
Dumbbell shoulder press	2	12-15
Dumbbell lateral raise	2	15
Barbell curl	2	12-15
Seated incline curl	2	15
Lying triceps extension	2	12-15
Triceps pressdown	2	15
Standing calf raise	2	15
Seated calf raise	2	15
Hanging knee raise	2	15
Crunch	2	15

WEEKS 9-12: MONDAY		
Exercise	**Sets**	**Reps**
Leg press	4	10-12
Bench press	4	10-12
Seated cable row	4	10-12
Dumbbell shoulder press	4	10-12
Barbell curl	4	10-12
Triceps pressdown	4	10-12
Standing calf raise	4	10-12
Crunch	4	15
WEEKS 9-12: WEDNESDAY		
Squat	4	10-12
Decline dumbbell press	4	10-12
Straight-arm pulldown	4	10-12
Rear delt raise	4	10-12
Preacher curl	4	10-12
Seated overhead triceps extension	4	10-12
Seated calf raise	4	10-12
Hanging leg raise	4	15
WEEKS 9-12: FRIDAY		
Lunge	4	12
Dumbbell incline fly	4	12
Lat pulldown	4	12
Dumbbell lateral raise	4	12
Seated incline curl	4	12
Lying triceps extension	4	12
Leg-press calf raise	4	15
Oblique crunch	4	15

WEEKS 13-16: MONDAY AND THURSDAY (CHEST, SHOULDERS, TRAPS, BACK, ABS)			
Muscle group	**Exercise**	**Sets**	**Reps**
Chest	Incline bench press	2	8-10
	Dumbbell bench press	2	8-10
	Cable crossover	2	8-10
Shoulders	Barbell shoulder press	2	8-10
	Cable lateral raise	2	8-10
	Dumbbell rear delt raise	2	8-10
Traps	Barbell shrug	3	8-10
Back	Pull-up	2	8-10
	Dumbbell row	2	8-10
	Underhand-grip pulldown	2	8-10
Abs	Hanging knee raise	3	10-15
	Decline bench crunch	3	8-10

(continued)

Beginner Basic Program *(continued)*

Muscle group	Exercise	Sets	Reps
WEEKS 13-16: TUESDAY AND FRIDAY (LEGS, CALVES, TRICEPS, BICEPS, FOREARMS)			
Legs	Squat	2	8-10
	Leg press	2	8-10
	Leg extension	2	8-10
	Lying leg curl	2	8-10
Calves	Standing calf raise	3	8-10
	Seated calf raise	2	8-10
Triceps	Close-grip bench press	2	8-10
	Triceps pressdown	2	8-10
Biceps	Barbell curl	3	8-10
	Preacher curl	2	8-10
Forearms	Wrist curl	2	8-10
	Reverse wrist curl	2	8-10
WEEKS 17-20: MONDAY (CHEST, SHOULDERS, TRAPS, BACK, ABS)			
Chest	Bench press	3	10-12
	Incline cable fly	3	10-12
Shoulders	Dumbbell shoulder press	3	10-12
	Wide-grip upright row	3	10-12
Traps	Barbell shrug	4	10-12
Back	Pulldown	3	10-12
	T-bar row	3	10-12
Abs	Hip thrust	3	10-15
	Exercise-ball crunch	3	10-15
WEEKS 17-20: TUESDAY (LEGS, CALVES, TRICEPS, BICEPS, FOREARMS)			
Legs	Smith machine squat	3	10-12
	Lunge	3	10-12
	Leg extension	2	10-12
	Lying leg curl	2	10-12
Calves	Standing calf raise	3	10-12
	Seated calf raise	3	10-12
Triceps	Dip	3	10-12
	Triceps pressdown	2	10-12
Biceps	EZ bar curl	3	10-12
	Concentration curl	3	10-12
Forearms	Dumbbell wrist curl	2	10-12
	Standing reverse wrist curl	2	10-12
WEEKS 17-20: THURSDAY (CHEST, SHOULDERS, TRAPS, BACK, ABS)			
Chest	Decline bench press	3	10-12
	Incline dumbbell fly	3	10-12
Shoulders	Barbell shoulder press	3	10-12
	Cable lateral raise	3	10-12
Traps	Dumbbell shrug	4	10-12

Back	Pull-up	3	10-12
	Smith machine row	3	10-12
Abs	Hanging knee raise	3	10-12
	Decline bench crunch	3	10-12
WEEKS 17-20: FRIDAY (LEGS, CALVES, TRICEPS, BICEPS, FOREARMS)			
Legs	Squat	3	10-12
	Hack squat	3	10-12
	One-leg leg extension	2	10-12
	Romanian deadlift	2	10-12
Calves	Donkey calf raise	3	10-12
	Seated calf raise	3	10-12
Triceps	Triceps pressdown	3	10-12
	Dumbbell lying triceps extension	2	10-12
Biceps	Barbell curl	3	10-12
	Scott curl	3	10-12
Forearms	Wrist curl	2	8-10
	Reverse wrist curl	2	8-10
WEEKS 21-24: MONDAY AND THURSDAY (CHEST, SHOULDERS, TRAPS, BACK, ABS)			
Chest	Bench press	3	6-8
	Decline dumbbell press	3	6-8
	Incline dumbbell fly	2	6-8
Shoulders	Dumbbell shoulder press	3	6-8
	Dumbbell lateral raise	2	6-8
	Cable rear delt raise	2	6-8
Traps	Barbell shrug	3	6-8
	Dumbbell shrug	3	6-8
Back	Pull-up	3	6-8
	Barbell row	3	6-8
	Straight-arm pulldown	3	6-8
Abs	Hanging knee raise	3	10-12
	Decline bench crunch	3	10-12
WEEKS 21-24: TUESDAY AND FRIDAY (LEGS, CALVES, TRICEPS, BICEPS, FOREARMS)			
Legs	Leg press	3	6-8
	Leg extension	3	6-8
	Romanian deadlift	3	6-8
Calves	Standing calf raise	3	6-8
	Seated calf raise	3	10-12
Triceps	Triceps pressdown	3	6-8
	Lying triceps extension	3	6-8
Biceps	Barbell curl	3	6-8
	Dumbbell preacher curl	3	6-8
Forearms	Wrist curl	2	8-10
	Reverse wrist curl	2	8-10

Intermediate Program (Six Months to One Year)

If you are an intermediate lifter, you are at a unique level of weightlifting experience. Because of neurological training, you have surpassed the rapid gains in strength that beginners experience, yet you haven't started to plateau in the gains related to muscle fiber growth. You also have a fair amount of knowledge of and enthusiasm for strength training. This is the stage where the particular training program is not as critical for making continued gains as long as you maintain a periodized plan.

If you are an intermediate lifter, you should follow a basic training program that involves a three-day or four-day split, as discussed in chapter 5. Making frequent changes in exercise selection provides the muscles with resistance from a variety of angles to stress different individual muscle fibers within the targeted muscle. However, the most critical change comes in the form of the resistance, or weight, used and the number of reps performed per set.

The yearlong program found in table 7.2 outlines the rep ranges you should follow throughout the year to graduate to advanced weightlifter status. Because research shows that periodized programs that last a minimum of 8 weeks and a maximum of 20 weeks are the most beneficial (Rhea and Alderman 2004), the intermediate program follows a 20-week linear mass cycle, then an 8-week mass microcycle, and finally a 20-week undulating-mass cycle (which assumes you are using a four-day split). Each phase of the program allows one week of active recovery (where other physical activity outside of weightlifting is encouraged) before moving to the next phase, along with one week of active rest during the undulating phase, for a 52-week program that will keep the muscle gains coming.

If you are an intermediate and are interested in making gains in general mass, you should follow the basic design guidelines in chapter 5 for making exercise selections. Rest periods should be about two to three minutes between exercises, but you should manipulate these on occasion. For example, when reps are in a low phase (4 to 6), allow up to four minutes of rest between sets. When reps are in a high phase (more than 12), limit rest to one minute between sets. For all other rep ranges, keep the rest period between sets to two to three minutes. Cycling the rest periods will further enhance gains in muscle mass.

If you are concerned with gaining muscle while losing body fat, you should limit rest periods to under one minute. Research suggests that keeping the rest periods below one minute can enhance the number of calories burned during and after a strength training workout, regardless of the rep range used (Falvo et al. 2005). It is also wise to use as many compound exercises as possible. These use more muscle groups than isolation exercises and therefore help to burn more calories. Of course, performing aerobic exercise in addition to strength training is critical to losing body fat along with limiting caloric intake through proper dieting.

As an intermediate, if you want to use more advanced training techniques during this program, you can find numerous methods in chapter 6 that you can throw in where the rep ranges are appropriate. Several techniques found in the programs that manipulate sets and exercise selection, and even a few in the rep manipulation methods section, are not dependent on rep ranges and can be dropped in where desired. For example, try slow-rep training during weeks 5 to 8, negative training during week 23, and barbell blasting during week 26; throw in superset and forced-rep training where desired during weeks 31 to 51.

Advanced Program (More Than One Year)

If you are an advanced weightlifter, you are at the most difficult level of weightlifting in which to encourage muscle growth. This is because you have spent a long time training and therefore are closer to reaching your genetic ceiling for muscle growth. Because of this, you must frequently train with advanced training techniques that are high in intensity to help stimulate muscle growth. The one-year advanced program in table 7.3 cycles advanced training techniques found in chapter 6 with basic training splits to offer periods of lower intensity in which the muscles can recover before the next advanced technique starts. Feel free to replace any technique with one that better suits your needs at the time. The same can be said about the training splits. Neither the specific techniques nor the specific splits are critical to this yearlong program. What is important is that you cycle four to six weeks of advanced technique training with about four to six weeks of a basic training program that is lower in intensity.

Table 7.2 Advancing Intermediate Program

PHASE 1: LINEAR MASS		
Week		Rep range
1-4		4-6
5-8		6-8
9-12		8-10
13-16		10-12
17-20		12-15
21	Active rest	
PHASE 2: MICROMASS		
22		8-10
23		5-8
24		3-5
25		12-15
26		3-5
27		5-8
28		8-10
29		10-12
30	Active rest	
PHASE 3: UNDULATING MASS		
31	Workout 1	8-10
	Workout 2	12-15
	Workout 3	6-8
	Workout 4	12-15
32	Workout 1	6-8
	Workout 2	10-12
	Workout 3	8-10
	Workout 4	12-15
33	Workout 1	8-10
	Workout 2	3-5
	Workout 3	6-8
	Workout 4	12-15
34	Workout 1	10-12
	Workout 2	8-10
	Workout 3	6-8
	Workout 4	12-15
35	Workout 1	3-5
	Workout 2	10-12
	Workout 3	6-8
	Workout 4	8-10
36	Workout 1	12-15
	Workout 2	10-12
	Workout 3	6-8
	Workout 4	3-5
37	Workout 1	8-10
	Workout 2	12-15
	Workout 3	6-8
	Workout 4	10-12
38	Workout 1	12-15
	Workout 2	8-10
	Workout 3	3-5
	Workout 4	12-15
PHASE 3: UNDULATING MASS		
39	Workout 1	6-8
	Workout 2	10-12
	Workout 3	12-15
	Workout 4	8-10
40	Workout 1	10-12
	Workout 2	12-15
	Workout 3	6-8
	Workout 4	3-5
41	Active rest	
42	Workout 1	8-10
	Workout 2	12-15
	Workout 3	6-8
	Workout 4	12-15
43	Workout 1	10-12
	Workout 2	8-10
	Workout 3	12-15
	Workout 4	10-12
44	Workout 1	3-5
	Workout 2	10-12
	Workout 3	12-15
	Workout 4	6-8
45	Workout 1	8-10
	Workout 2	10-12
	Workout 3	12-15
	Workout 4	3-5
46	Workout 1	6-8
	Workout 2	12-15
	Workout 3	10-12
	Workout 4	8-10
47	Workout 1	12-15
	Workout 2	6-8
	Workout 3	8-10
	Workout 4	10-12
48	Workout 1	3-5
	Workout 2	10-12
	Workout 3	12-15
	Workout 4	6-8
49	Workout 1	8-10
	Workout 2	12-15
	Workout 3	6-8
	Workout 4	10-12
50	Workout 1	12-15
	Workout 2	8-10
	Workout 3	12-15
	Workout 4	6-8
51	Workout 1	3-5
	Workout 2	10-12
	Workout 3	8-10
	Workout 4	12-15
52	Active rest	

Table 7.3 Advanced Growth Program

Week	Technique	Notes
1-4	Basic four- or five-day split	Reps: 10-12; rest: 2-3 min
5-8	5–10–20	Follow five-day split schedule.
9-12	Advanced whole-body split	Reps: 12-15; rest: 1-2 min
13-16	Superset training	Follow two- or three-day split; do it twice per week. *Three-day split:* Workouts 1 and 4: Chest/back, shoulders/back Workouts 2 and 5: Biceps/triceps Workouts 3 and 6: Legs (quads and hamstrings) *Two-day split:* Workouts 1 and 3: Chest/back, shoulders/back Workouts 2 and 4: Biceps/triceps, legs (quads and hamstrings) Reps: 8-10
17	Active rest	
18-21	Basic four- or five-day split	Reps: 6-8; rest: 2-3 min
22-25	Drop-set training	Follow a five-day split. Reps: 10-12 for start of each drop set; rest: 2-3 min
26-29	Basic two-day split	Choose different exercise for workouts 1 and 2 as well as workouts 3 and 4. Reps: 8-10; rest: 2-3 min
30-31	Power circuit training	Perform twice per week.
32	Tri-set training	Follow a four-day split. Two tri-set groups for chest, shoulders, back, legs. One tri-set group for biceps, triceps, traps, forearms, calves, abs Reps: 8-10; 3 sets per tri-set; rest: 2-3 min between tri-sets
33	Giant-set training	Follow a five-day split. Do 1 giant set for all muscle groups. Do 4 sets for chest, shoulders, back, legs. Do 3 sets for biceps, triceps, traps, forearms, calves, abs. Reps: 10-12; rest: 2-3 min between tri-sets
34	Active rest	
35-38	Slow-repetition training	Follow a three-day split; train once per week. Reps: 5-10; rest: 2-3 min
39-42	Basic two- or three-day split	Train twice per week. Reps: 12-15; rest: 1-2 min
43-46	Heavy and light multiple-exercise method	Follow a four-day split. Rest: 2-3 min
47	Hundreds training	Follow a two-day split; train twice per week.
48-49	Basic five-day split	Reps: 3-6
50-51	One-sided training	Follow workout split provided on page 110.
52	Active rest	

GOAL TENDING

The long-term programs you just read about are a great start for anyone at any level of experience, as long as the goal is to put on overall muscle size. However, as weightlifters progress, their goals tend to be more specific. Maybe they want to maximize both mass and strength, maybe they want to get lean and large, or maybe they want to develop a specific muscle group. If you are an intermediate or advanced weightlifter and are interested in specific goals, you should follow a long-term program that manipulates the appropriate training variables to enable you to reach those goals. This portion of the chapter has detailed program cycles to match common goals shared by most bodybuilders. More than likely, any goal regarding strength training for muscle mass will be listed here. Try one of the following programs that meets your goals, or design your own personalized program based on the knowledge you have acquired through reading this book.

Lean and Large

Chances are that if you are interested in bodybuilding or strength training for muscle mass, you are also interested in building just lean muscle mass and not adding body fat. Body fat blurs the shape and striations of well-developed muscles.

Although a proper diet and plenty of aerobic exercise are tools to help you shed body fat while gaining muscle, certain strength training programs are better than others for getting lean. This lean and large program is composed of three four-week phases that all emphasize compound movements (see table 7.4). Compound exercises use the most muscle fibers and therefore burn the most calories.

Training with heavy weight and low reps (4 to 6) keeps the metabolism highest after the workout. Keeping reps high (12 to 20) burns the most calories during the workout. Training heavy in addition to doing high reps has the greatest effect on calorie burn. That's why this program uses heavy weight for half the sets and light weight for the final sets of most exercises. Rest between sets is also critical for burning calories; shorter rest periods lead to greater calorie burn. This program uses rest periods of 30 to 60 seconds between sets and a four-day training split. However, you will be training six days a week to maximize your caloric expenditure. This means you can repeat the four-day split (done on consecutive days), with one rest day between workout 4 and workout 1, a total of six times. For example, you will start with workout 1 on Monday, workout 2 on Tuesday, workout 3 on Wednesday, and workout 4 on Thursday. You rest on Friday and then continue the cycle with workout 1 on Saturday.

In phase 1, you train with 6 reps on the heavy sets and 12 reps on the light sets. You do two heavy sets and two light sets for most exercises. Rest periods during this first phase are 60 seconds between sets.

In phase 2, the reps on the heavy sets drop to 5 per set while reps on the light sets increase to 15 per set. Lighter sets also increase to three per exercise to increase volume and total calories burned during the workout. Rest periods should drop to 30 seconds between sets to further enhance calorie burn during and after the workout.

In phase 3, the reps on the heavy sets drop again to 4 per set, and reps on the light sets increase to 20 per set. In this phase, heavy sets increase to three. Rest periods should remain at 30 seconds between sets.

At the end of phase 3 you can continue the 12-week program if you feel you have more body fat to lose. Take one week off from the gym with an active rest period, in which you do other activities a minimum of six days per week. Then simply start the program over at phase 1.

Big and Strong

For some weightlifters getting big is not the only goal. They are concerned with developing strength and muscle mass at the same time—and with good reason. Generally, as muscles increase in strength, they also increase in size. While there isn't a definite correlation between muscle strength and muscle size, it makes sense that if you can lift more weight or perform more reps with a given amount of weight, you will better stimulate muscle growth. This follows the principle of overload.

The six-month big and strong program cycles two pyramid techniques—the DeLorme ascending pyramid method (covered in chapter 9) and the Oxford descending pyramid method (covered in chapter 6). (See table 7.5.) With the DeLorme ascending pyramid technique your first set is done with about 50 percent of your 10-rep max (10RM) for a given exercise, but for just 10 reps. On the second set, you increase the weight to about 75

Table 7.4 Lean and Large Program

PHASE 1: WEEKS 1-4

WORKOUT 1: CHEST AND TRICEPS

Muscle group	Exercise	Sets	Reps
Chest	Incline bench press	2	6
		2	12
	Dumbbell bench press	2	6
		2	12
	Incline fly	4	12
Triceps	Dip	2	6
		2	12
	Close-grip bench press	2	6
		2	12
	Dumbbell overhead triceps extension	2	12

WORKOUT 2: LEGS, CALVES, AND ABS

Legs	Squat	2	6
		2	12
	Leg press	2	6
		2	12
	Leg extension	4	12
	Leg curl	4	12
Calves	Standing calf raise	4	12
	Seated calf raise	4	12
Abs	Hanging leg raise	4	12
	Crunch	4	12

WORKOUT 3: SHOULDERS AND TRAPS

Shoulders	Barbell shoulder press	2	6
		2	12
	Seated dumbbell shoulder press	2	6
		2	12
	Lateral raise	4	12
Traps	Barbell shrug	2	6
		2	12
	Dumbbell shrug	2	6
		2	12

WORKOUT 4: BACK, BICEPS, FOREARMS, AND ABS

Back	Deadlift	4	6
	Barbell row	2	6
		2	12
	Lat pulldown	2	6
		2	12
	Straight-arm pulldown	4	12
Biceps	Barbell curl	2	6
		2	12
	Seated incline dumbbell curl	2	6
		2	12
	Hammer curl	2	6
		2	12
Forearms	Wrist curl	2	12
	Reverse wrist curl	2	12
Abs	Reverse crunch	4	15
	Cable crunch	4	12

PHASE 2: WEEKS 5-8

WORKOUT 1: CHEST AND TRICEPS

Chest	Bench press	2	5
		3	15
	Incline dumbbell press	2	5
		3	15
	Decline fly	4	15
Triceps	Smith machine close-grip bench press	2	5
		3	15
	Machine triceps dip	2	5
		3	15
	Lying triceps extension	2	15

WORKOUT 2: LEGS, CALVES, AND ABS

Legs	Smith machine squat	2	5
		3	15
	Lunge	2	5
		3	15
	Leg extension	4	15
	Romanian deadlift	4	15
Calves	Leg press calf raise	4	15
	Seated calf raise	4	15
Abs	Hip thrust	4	15
	Crossover crunch	4	15

WORKOUT 3: SHOULDERS AND TRAPS

Shoulders	Dumbbell shoulder press	2	5
		3	15
	Smith machine shoulder press	2	5
		3	15
	Wide-grip upright row	4	15
Traps	Barbell shrug	2	5
		3	15
	Dumbbell shrug	2	5
		3	15

WORKOUT 4: BACK, BICEPS, FOREARMS, AND ABS			
Muscle group	Exercise	Sets	Reps
Back	Deadlift	5	5
	Dumbbell row	2	5
		3	15
	Underhand-grip pulldown	2	5
		3	15
	Straight-arm pulldown	4	15
Biceps	Standing dumbbell curl	2	5
		3	15
	Preacher curl	2	5
		3	15
	Reverse curl	2	5
		2	15
Forearms	Wrist curl	2	15
	Reverse wrist curl	2	15
Abs	Reverse crunch	4	15
	Exercise-ball crunch	4	15

PHASE 3: WEEKS 9-12

WORKOUT 1: CHEST AND TRICEPS			
Chest	Dumbbell bench press	3	4
		3	20
	Smith machine incline bench press	3	4
		3	20
	Cable crossover	4	20
Triceps	Dumbbell close-grip bench press	3	4
		3	20
	Dumbbell overhead triceps extension	2	4
		3	20
	Triceps pressdown	2	20

WORKOUT 2: LEGS, CALVES, AND ABS			
Legs	Squat	3	4
		3	20
	One-leg leg press	3	4
		3	20
	Leg extension	4	20
	Romanian deadlift	4	20
Calves	Standing calf raise	4	20
	Seated calf raise	4	20
Abs	Hanging knee raise	4	20
	Decline crunch	4	20

WORKOUT 3: SHOULDERS AND TRAPS			
Shoulders	Standing dumbbell shoulder press	3	4
		3	20
	Standing barbell shoulder press	3	4
		3	20
	Cable lateral raise	4	20
Traps	Barbell shrug	3	4
		3	20
	Dumbbell shrug	2	4
		3	20

WORKOUT 4: BACK, BICEPS, FOREARMS, AND ABS			
Back	Deadlift	5	4
	T-bar row	3	4
		3	20
	Lat pulldown	3	4
		3	20
	Straight-arm pulldown	4	20
Biceps	Barbell curl	3	4
		3	20
	Concentration curl	3	4
		3	20
	Rope hammer curl	2	4
		2	20
Forearms	Dumbbell wrist curl	2	20
	Standing reverse wrist curl	2	20
Abs	Reverse crunch	4	20
	Crossover crunch	4	20

percent of your 10RM for that exercise and again stop at 10 reps. On the third set you increase the weight to 100 percent of your 10RM for that exercise and complete as many reps as you can until reaching failure. The repetition maximum is not critical, because many powerlifters use this pyramid method with 3RM, 4RM, 5RM, and 6RM to train for strength. In fact, during the second half of this program you will use a 6RM during the DeLorme portion of the training. With the Oxford descending pyramid technique, the first set is done with 100 percent of your 10RM to failure. On the second and third sets you reduce the weight just enough to allow you to complete about 10 reps. Again, the repetition maximum you use is not critical because it is commonly used with 6RM, 8RM, 12RM, and 15RM. In the second half of this program the reps increase to 12 per set. See table 7.5.

The DeLorme method tends to be better for deriving strength gains, while the Oxford method is better for stimulating muscle growth (Fish et al. 2003). This may be due to the amount of times you reach failure on each exercise. With the DeLorme technique, failure is reached only once, whereas the Oxford technique elicits failure on all three sets. Australian researchers have shown that training to failure on just one set increases strength gains better than going to failure on more than one set (Drinkwater et al. 2005). Muscle failure, however, seems to be important for inducing muscle growth. The reason for this is that reaching muscle failure better stimulates the release of growth hormone (GH) and insulin-like growth factor-I (IGF-I). Both are anabolic hormones that stimulate muscles to grow. That is why this program cycles both methods. In the end, you achieve greater strength and muscle growth.

With the big and strong program you pyramid up in weight on all your exercises during weeks 1 to 6 and again during weeks 13 to 18. The difference in these two phases is the amount of weight you do on the last set of each exercise. During weeks 1 to 6 you end with a weight you can do for 10 reps. During weeks 13 to 18 you end with a weight that you can do for 6 reps. During these parts of the program you will train each muscle group twice per week. That's because you will need less recovery time between workouts because you do fewer total working sets per workout and train to failure on only one set per exercise.

You can use the strength you gain during weeks 1 to 6 and 13 to 18 for lifting heavier weights during weeks 7 to 12 and 19 to 24. Weeks 7 to 12 and 9 to 24 take you down the pyramid as you decrease the weight on each successive set for all exercises. During these phases, you train each muscle group just once per week because they will need the recovery since you will do more total working sets per muscle group, plus you will train to failure on every set.

Table 7.5 Up and Down for Strength and Size Program

WEEKS 1-6: DELORME 10RM STRENGTH PHASE MONDAY AND THURSDAY: CHEST, SHOULDERS, TRICEPS			
Exercise	**Set**	**Weight**	**Reps**
Incline bench press	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Dumbbell bench press	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Barbell shoulder press	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Upright row	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Barbell shrug	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*

Exercise	Set	Weight	Reps
Close-grip bench press	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Triceps pressdown	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
TUESDAY AND FRIDAY: LEGS, BACK, BICEPS			
Barbell row	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Lat pulldown	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Barbell curl	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Dumbbell hammer curl	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Squat	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Leg press	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Romanian deadlift	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Standing calf raise	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*
Seated calf raise	1	50% 10RM	10
	2	75% 10RM	10
	3	100% 10RM	10*

WEEKS 7-12: OXFORD 10RM MASS PHASE

MONDAY: CHEST AND TRICEPS

Exercise	Set	Weight	Reps (to failure)
Incline dumbbell bench press	1	100% 10RM	10
	2	<100% 10RM**	10
	3	<100% 10RM	10
Smith machine bench press	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Incline dumbbell fly	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Triceps pressdown	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

(continued)

Up and Down for Strength and Size Program *(continued)*

WEEKS 7-12: OXFORD 10RM MASS PHASE

MONDAY: CHEST AND TRICEPS

Exercise	Set	Weight	Reps (to failure)
Seated overhead triceps extension	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

TUESDAY: LEGS

Smith machine squat	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Lunge	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Leg extension	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Leg curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

THURSDAY: SHOULDERS

Dumbbell shoulder press	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Lateral raise	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Bent-over lateral raise	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Dumbbell shrug	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

FRIDAY: BACK AND BICEPS

Lat pulldown	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
T-bar row	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Straight-arm pulldown	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Seated incline curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Preacher curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10
Reverse-grip curl	1	100% 10RM	10
	2	<100% 10RM	10
	3	<100% 10RM	10

Note: Abs can be done at the end of any of these workouts.

WEEKS 13-18: DELORME 6RM STRENGTH PYRAMID

MONDAY AND THURSDAY: CHEST, SHOULDERS, TRICEPS

Exercise	Set	Weight	Reps
Incline bench press	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Dumbbell bench press	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Barbell shoulder press	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Upright row	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Barbell shrug	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Close-grip bench press	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Triceps pressdown	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*

TUESDAY AND FRIDAY: LEGS, BACK, BICEPS

Exercise	Set	Weight	Reps
Barbell row	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Lat pulldown	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Barbell curl	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Dumbbell hammer curl	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Squat	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Leg press	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Romanian deadlift	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Standing calf raise	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*
Seated calf raise	1	50% 6RM	6
	2	75% 6RM	6
	3	100% 6RM	6*

WEEKS 19-24: OXFORD 12RM MASS PHASE

MONDAY: CHEST AND TRICEPS

Exercise	Set	Weight	Reps (to failure)
Incline dumbbell bench press	1	100% 12RM	12
	2	<100% 12RM**	12
	3	<100% 12RM	12
Smith machine bench press	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Incline dumbbell fly	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Triceps pressdown	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12

(continued)

WEEKS 19-24: OXFORD 12RM MASS PHASE

MONDAY: CHEST AND TRICEPS

Exercise	Set	Weight	Reps (to failure)
Seated overhead triceps extension	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12

TUESDAY: LEGS

Smith machine squat	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Lunge	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Leg extension	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Leg curl	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12

THURSDAY: SHOULDERS

Dumbbell shoulder press	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Lateral raise	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Bent-over lateral raise	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Dumbbell shrugs	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12

FRIDAY: BACK AND BICEPS

Lat pulldown	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
T-bar row	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Straight-arm pulldown	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Seated incline curl	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Preacher curl	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12
Reverse-grip curl	1	100% 12RM	12
	2	<100% 12RM	12
	3	<100% 12RM	12

Note: Abs can be done at the end of any of these workouts.

*To failure.

**On the second and third sets of each exercise in this phase, reduce weight just enough to allow 10 reps to be completed.

Superpumps

For bodybuilders the muscle pump is the ultimate goal of most workouts. The pump is the rapid expansion in the size of muscles during a workout. The pump simply refers to the filling up of muscle cells with water. When you work out, you produce waste products in the muscle cells. These waste products are the result of burning glucose and fat to fuel muscle contractions, and their build-up inside muscle cells draws water (from the blood in the capillaries that feed the muscle and the area surrounding the cells) into the muscle cells. As with a balloon, the more water that the muscle cell can hold, the bigger the pump. The pump essentially places a stretch on the muscle cell. This stretch not only makes muscles momentarily bigger, but it also initiates biochemical pathways that signal the muscle cell to grow.

Training with very high reps causes a greater flow of blood to the trained muscles. It's the muscle contraction that stimulates the blood to be directed in that direction. During the superpump program, workouts focus on just one or two muscle groups per session (see table 7.6). Each muscle group will be trained just once a week with high reps and multiple sets. The workouts focus on isolation exercises and cables for constant tension and employ techniques such as preexhaust, supersets, compound sets, tri-sets, and drop sets. Keep rest to no more than 90 seconds between sets or as specified for each training protocol. Follow this program for no more than six weeks before switching to a program that uses heavier weight and lower reps. After that, you can go back to the superpump program for maximizing muscle pumps during the workout and creating long-term muscle growth.

MUSCLE FOCUS

Many bodybuilders are concerned with the development of particular muscle groups, such as biceps, chest, and shoulders. For some, this is due to an imbalance in their overall muscle development—often caused by genetics or improper training. For others, this is due to simple desire for having certain muscle groups (often the biceps) as large as possible. If you have a particular muscle group that you want to concentrate on developing, try one of the following muscle-specific programs. There is a specific program for each major muscle group. Each program is tried and true in application and results.

Big Chest Program

Big pecs are the signature body part of a serious bodybuilder. If your chest is a weak spot on your physique, try following the big chest program shown in table 7.7. It is a 16-week program broken down into four separate phases that alter exercise selection, training techniques used, weight and rep ranges, number of sets, and even rest periods.

During this program you should alternate between a four-day and five-day training split. During weeks 1, 3, 5, 7, 9, 11, 13, and 15 you will train chest twice per week while training all other muscle groups just once. For this you will use a four-day split that trains chest and abs on Monday and Friday; shoulders and triceps on Tuesday; back, biceps, and abs on Wednesday; and legs and calves on Thursday. During weeks 2, 4, 6, 8, 10, 12, 14, 16 you train chest once per week using a five-day split that works chest and abs on Monday; legs and calves on Tuesday; shoulders and abs on Wednesday; back on Thursday; and biceps, triceps, and abs on Friday.

Phase 1 is designed to build mass and strength; therefore, it involves mainly compound exercises done for low reps. Phase 2 develops muscle size and separation by increasing the number of isolation exercises and reps performed per set. Phase 3 is designed to shape and define the muscle you built in the first eight weeks by increasing the reps used again and incorporating compound sets. Phase 4, the final phase, is a combination of the three prior phases. It uses only heavy pressing exercises for two of the workouts during weeks 13 and 15, lighter isolation for exercises for another two workouts during those weeks, and compound sets with higher volume for the single chest workout during weeks 14 and 16.

Big Wheels Program

Big legs seem to be last on the wish list of many bodybuilders. The lower half of the body seems to get neglected in an effort to focus on the more obvious muscle groups of the upper body, such as the arms and chest. If you've been guilty of neglecting your leg training, or if you are wise enough to realize that muscular legs are just as important as a muscular upper body to produce a balanced physique, try this big wheels program to pack on muscle to your quads and hams.

Table 7.6 Superpump Program

Exercise	Sets	Reps	Notes
MONDAY: CHEST, CALVES			
Incline dumbbell fly	4	12	Do each set to failure.
Incline bench press	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Dumbbell bench press	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Pec deck	4	20-30	Keep rest between sets to less than 30 seconds.
Standing calf raise	5	20-30	Keep rest between sets to less than 30 seconds.
Seated calf raise	5	20-30	Keep rest between sets to less than 30 seconds.
TUESDAY: BACK, ABS			
Straight-arm pulldown	3	12-15	Do each set to failure.
Barbell row	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Wide-grip and underhand-grip pulldown	4	12-15	Perform these as compound sets.
Straight-arm pulldown	4	20-30	Keep rest between sets to less than 30 seconds.
Hanging leg raise	4	12-15	Keep rest between sets to less than 30 seconds.
Crunch	4	15-25	Keep rest between sets to less than 30 seconds.
WEDNESDAY: QUADS, HAMS, CALVES			
Leg extension and leg curl	4	12-15	Perform as superset.
Smith machine squat	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Leg press	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Leg extension and Romanian deadlift	4	20-30	Perform as superset.
Seated calf raise	5	20-30	Keep rest between sets to less than 30 seconds.
Leg press calf raise	5	20-30	Keep rest between sets to less than 30 seconds.
THURSDAY: SHOULDERS, TRAPS, ABS			
Dumbbell rear, front, lateral raise	3	12-15	Perform as tri-set.
Dumbbell shoulder press	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Wide-grip upright row	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
One-arm cable lateral raise	4	20-30	Keep rest between sets to less than 30 seconds.
Dumbbell shrug	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Smith machine back and front shrugs	4	12-15	Perform as compound sets.
Reverse crunch	4	15-20	Keep rest between sets to less than 30 seconds.
Cable crunch	4	15-20	Keep rest between sets to less than 30 seconds.
FRIDAY: TRICEPS, BICEPS, FOREARMS			
Dumbbell kickback	4	12-15	Do each set to failure.
Close-grip bench press	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
Overhead rope extension	4	20-30	Keep rest between sets to less than 30 seconds.
Seated incline curl	4	12-15	Keep rest between sets to less than 30 seconds.
Barbell curl	4	12-15	Drop set on last set. Drop weight 30 percent and continue to failure.
One-arm high cable curl	4	20-30	Keep rest between sets to less than 30 seconds.
Barbell reverse wrist curl	4	15-20	Keep rest between sets to less than 30 seconds.
Barbell wrist curl	4	15-20	Keep rest between sets to less than 30 seconds.

Table 7.7 Big Chest Program

Exercise	Sets	Reps
PHASE 1: WEEKS 1-4		
Rest 60 to 120 seconds between sets.		
Cable crossover (prefatigue)	1	25
Incline barbell bench press	3	6
Flat dumbbell press	4	6
Decline barbell press	4	6
Dumbbell pullovers	3	6
PHASE 2: WEEKS 5-8		
Rest about 60 seconds between sets.		
Decline push-up (prefatigue)	1	25
Decline dumbbell press	3	8-10
Incline dumbbell press	4	8-10
Flat dumbbell fly	4	8-10
Cable crossover	3	8-10
PHASE 3: WEEKS 9-12		
Rest 30 to 60 seconds between sets.		
Pec deck	1	25
Flat dumbbell press	3	12-15
Incline dumbbell fly	3	12-15
Compound set with cable crossover	3	12-15
Decline barbell press	3	12-15
Compound set with pullover	3	12-15
PHASE 4: WEEKS 13-16		
Rest 60 seconds between sets during weeks 13 and 15; 2 minutes between sets during weeks 14 and 16.		
MONDAY WORKOUT (WEEKS 13 AND 15)		
Bench press	4	4-6
Incline press	4	6-8
Decline press	4	8-10
FRIDAY WORKOUT (WEEKS 13 AND 15)		
Incline fly	4	12-15
Flat fly	4	12-15
Pec deck fly	4	12-15
MONDAY WORKOUT (WEEKS 14 AND 16)		
Incline dumbbell fly	4	10-12
Compound set with incline press	4	8-10
Pec deck	4	12-15
Compound set with machine bench press	4	10-12

The 16-week big wheels program (see table 7.8) is broken down into four 4-week phases. Phase 1 kicks off with a high-intensity training (HIT) leg program that uses heavy weight. As discussed in chapter 6, this training method uses high-intensity methods and low volume. Precede each set with one short warm-up set with approximately 50 percent of the weight you will use for the working set. Take each working set to muscle failure. In addition, you should have a spotter help you perform three or four forced reps after reaching muscle failure. Resist the negative portion on every forced rep. Perform the HIT leg workout on Monday and Friday (add abs following the Friday workout). Train chest, back, and abs on Tuesday; train shoulders, biceps, and triceps on Wednesday. Take Thursday off.

Phase 2 training drops the workouts back to one per week as the volume and reps increase dramatically. It also uses supersets and preexhaust techniques to keep the intensity high. This phase should be done as a five-day split, training legs on Monday; chest and abs on Tuesday; shoulders and traps on Wednesday; back on Thursday; and triceps, biceps, and calves on Friday. In addition to this training in the gym, in phase 2 you kick-start the 50–50 method for dumbbell squats (see page 84 of chapter 6 for details). You will follow the 50–50 program through phase 3 for a total of eight weeks. Use light dumbbells and perform one set of 50 reps of dumbbell squats in the morning and at night, every day.

Phase 3 drops the reps down to 10 to 12 per set, except on leg extensions where you will do three sets of 21 (see page 85 of chapter 6 for details). Leg training goes back to twice per week as you'll use the same split in weeks 1 to 4.

In phase 4 you are back to training legs once per week, but you split the workouts into two per day, with quadriceps on Monday morning and hamstrings and calves on Monday night. Because of this, the volume is very high, with multiple exercises for each muscle group. Follow the same split as done in phase 2. The reps drop back to 8 to 10 per set for optimal muscle gains.

Table 7.8 Big Wheels Program

Exercise	Sets	Reps
PHASE 1: WEEKS 1-4		
Leg extension	1	10-12
Smith machine squat	1	6-8
Leg press	1	6-8
Hack squat	1	6-8
Romanian deadlift	1	6-8
Lying leg curl	1	10-12
Seated leg curl	1	10-12
Standing calf raise	1	12-15
Seated calf raise	1	12-15
Leg press calf raise	1	12-15
PHASE 2: WEEKS 5-8		
Leg extension	5	20
Superset with lying leg curl	5	20
Squats	5	20
Leg press	5	20
Romanian deadlift	5	20
PHASE 3: WEEKS 9-12		
Squat	4	10-12
Hack squat	4	10-12
Leg extension	3	21s
Lying leg curl	4	10-12
Standing calf raise	4	10-12
Compound set with donkey calf raise	4	10-12
PHASE 4: WEEKS 13-16		
MORNING: QUADS		
Leg extension	3	8-10
Squat	3	8-10
Leg press	3	8-10
Hack squat	3	8-10
Walking lunge	3	20
One-leg leg extension	3	8-10
EVENING: HAMSTRINGS, CALVES		
Lying leg curl	3	8-10
Romanian deadlift	3	8-10
Standing leg curl	3	8-10
Seated leg curl	3	8-10
Seated calf raise	3	8-10
Donkey calf raise	3	8-10
Standing calf raise	3	8-10
Leg press calf raise	3	8-10

Calves to Cows Program

Calves seem to be the one muscle group of the lower body that few bodybuilders have developed to their satisfaction, and it's also the one muscle group that so many want to develop. Unfortunately, if you aren't genetically predisposed to building big calves, you will have to work extremely hard for every ounce of muscle you can add to them. The calves to cows program (see table 7.9) is for those bodybuilders who need to work their calves hard and diligently. This program is divided into four 4-week phases that change up the rep range and weight used, the volume, and the training frequency in a specific pattern. Each phase reduces the frequency at which you train the calves as well as the rep range, but it increases the volume (number of sets and exercises performed) and weight used.

Phase 1 starts off with training the calves five days a week. Use a basic five-day training split during this phase and train calves at the end of every workout. Reps are extremely high but volume is fairly low. Phase 2 increases the exercise number and the sets performed to four per exercise, but it drops the training frequency back to four days per week. You can use a four- or five-day training split during this phase. Reps decrease to about 15 to 20 per set. In phase 3, the frequency decreases to three times per week, but an extra calf exercise is added and compound-set training is used. Reps drop down to 12 to 15 per set. You can use a three-, four-, or five-day basic training split during this period of calf training. The final phase, phase 4, trains calves only twice per week. Sounds simple, but it increases the number of exercises performed and includes drop sets on the last set of every exercise. After you reach failure on the last set, drop the weight about 30 percent and repeat that twice. You can do this phase with any type of split.

Table 7.9 Calves to Cows Program

Exercise	Sets	Reps
PHASE 1: WEEKS 1-4		
Standing calf raise	3	25-30
Seated calf raise	3	25-30
PHASE 2: WEEKS 5-8		
Leg press calf raise	4	15-20
Seated calf raise	4	15-20
Standing calf raise	4	15-20
PHASE 3: WEEKS 9-12		
Standing calf raise	4	12-15
Donkey calf raise	4	12-15
Leg press calf raise	4	12-15
Compound set with seated calf raise	4	12-15
PHASE 4: WEEKS 13-16		
Seated calf raise (toes out)	2	8-10*
Seated calf raise (toes in)	2	8-10*
Seated calf raise (toes straight)	2	8-10*
Standing calf raise (toes straight)	2	8-10*
Standing calf raise (toes out)	2	8-10*
Standing calf raise (toes in)	2	8-10*
Leg press calf raise (toes straight)	2	8-10*
Leg press calf raise (toes out)	2	8-10*
Leg press calf raise (toes in)	2	8-10*

*Drop sets

Big Guns Program

Without a doubt, big arms are on the top of every bodybuilder's wish list. Even those who already have big arms want bigger arms. While most bodybuilders are looking to build impressive biceps, they really should be working to develop both the biceps and the triceps muscles. After all, the triceps make up a larger portion of the upper arm. More than likely, you too are interested in building bigger arms. The big guns program shown in table 7.10 is a 12-week program divided into three 4-week phases that will add significant muscle mass to anyone's arms.

Phase 1 (weeks 1 to 4) shocks the biceps and triceps muscles with low volume but frequent workouts that target the majority of the muscle fibers, a likely change for even the most experienced lifter. This phase uses a three-day split done just three days per week, and arms are trained on each day. This phase capitalizes on the small-angle training method covered on page 104 in chapter 6. Phase 2 (weeks 5 to 8) flips to the other side with a once-a-week workout that is superheavy and superintense. The low frequency should be a welcomed change for the muscles, which will gladly exchange the multiple workouts for the intensity. This phase uses partial-rep training to enhance strength and forced-rep training to encourage muscle growth. Phase 3 (weeks 9 to 12) is the home stretch. It picks the pace back up after four weeks of ample recovery time to couple preexhaust techniques with basic heavy weight sets.

Table 7.10 Big Guns Program

Muscle group	Exercise	Sets	Reps
PHASE 1: WEEKS 1-4			
MONDAY			
Chest	Choose 2 or 3 exercises	8-10 total	8-10
Shoulders	Choose 2 or 3 exercises	8-10 total	8-10
Triceps	Dip	3	8-10
	Seated one-arm overhead extension	2	8-10
Biceps	Seated incline dumbbell curl*	5	8-10
WEDNESDAY			
Back	Choose 2 or 3 exercises	8-10 total	8-10
Biceps	Wide-grip barbell curl	1	8-10
	Shoulder-width-grip barbell curl	1	8-10
	Close-grip barbell curl	1	8-10
	Dumbbell hammer curl	2	8-10
Triceps	Triceps pressdown	5	8-10
FRIDAY			
Triceps	Reverse-grip bench press	2	8-10
	Close-grip bench press	2	8-10
Biceps	Preacher curl	2	8-10
	Cable curl	2	8-10
Legs	Choose 3 exercises	10-12 total	8-10
PHASE 2: WEEKS 5-8			
MONDAY			
Chest	Choose 3 or 4 exercises	10-12 total	4-6
Shoulders	Choose 2 or 3 exercises	8-10 total	4-6
TUESDAY			
Back	Choose 3 or 4 exercises	10-12 total	4-6
THURSDAY			
Triceps	Close-grip bench press in power rack**	3	4-6
	Triceps pressdown***	3	4-6
Biceps	Seated barbell curl‡		
	Preacher curl***	3	4-6
FRIDAY			
Legs	Choose 4 or 5 exercises	12-16 total	4-6
PHASE 3: WEEKS 9-12			
MONDAY			
Chest	Choose 3 or 4 exercises	10-12 total	10-12
Shoulders	Choose 2 or 3 exercises	8-10 total	10-12
TUESDAY			
Triceps	One-arm underhand-grip pressdown	3	10-12
	Close-grip bench press*	3	6-8

Muscle group	Exercise	Sets	Reps
Biceps	EZ bar preacher dumbbell curl	3	10-12
	WEDNESDAY		
Legs	Choose 4 or 5 exercises	12-16 total	10-12
	THURSDAY		
Back	Choose 3 or 4 exercises	10-12 total	10-12
	FRIDAY		
Biceps	Cable concentration curl	3	10-12
	Barbell curl***	3	10-12
Triceps	Dumbbell close-grip press	3	6-8
	Rope pressdown	3	8-10

* Do as small-angle sets, doing five sets of incline curls at different angles.
**Do two sets with rack set in top half of ROM. On set 3, remove pins and do full-range reps.
***Train to failure then do two or three forced reps on all 3 sets.
‡ Load a bar with 10 to 20+ pounds more than you can get for four to six reps of normal barbell curls. Sit on a flat bench and rest the bar on your thighs. With a shoulder-width, underhand grip, curl the weight up toward your shoulders.

Wider Is Better Back Program

Having a wide back makes you look impressive from both the front and back. It's also an important area to develop for strength in all other exercises. This 16-week program can help you build up a weak back (see table 7.11). Phase 1 uses pull-ups as a warm-up and deadlifts, rows, and good mornings to build a strong back. Reps are low to encourage strength gains, and the volume is low because you do this workout twice a week during this phase on Monday and Friday along with abs. Do chest, shoulders, and calves on Tuesday; biceps, triceps, and abs on Wednesday; and legs on Thursday. Phase 2 increases the volume and decreases the frequency to once per week. Train chest, shoulders, and abs on Monday. The compound sets add another level of challenge, which means the back muscles will need a full week of recovery during this phase. Phase 3 is done twice per week with the same training split that is used in phase 1. The Monday and Friday workouts are

Table 7.11 Wider Is Better Back Program

PHASE 1: WEEKS 1-4		
Exercise	**Sets**	**Reps**
Pull-up	3	8-10
Deadlift	3	4-6
Barbell bent-over row	3	4-6
Lat pulldown	3	4-6
Barbell good morning	3	8-10
PHASE 2: WEEKS 5-8		
Pull-up	2	10-12
Barbell row	3	8-10
Compound set with lat pulldown	3	8-10
T-bar rows	3	8-10
Compound set with straight-arm pulldown	3	8-10
Back extension	3	8-10

PHASE 3: WEEKS 9-12		
MONDAY		
Barbell row	4	6-8
Dumbbell row	4	6-8
Seated cable row	4	6-8
FRIDAY		
Pull-up	2	8-10
Lat pulldown (wide grip)	2	10-12
Lat pulldown (narrow grip)	2	10-12
Lat pulldown (underhand grip)	2	10-12
PHASE 4: WEEKS 13-16		
Lat pulldown	4	12-15
Incline bench cable row from high pulley	4	12-15
Seated cable row	4	12-15
One-arm bent-over cable row	4	12-15
Back extension	3	12-15

different. The Monday workout focuses on rowing exercises done with heavier weight and low reps. The Friday workout, on the other hand, focuses on pull-ups and pulldowns with lighter weight and higher reps. This workout should be one giant set cycled through twice. Phase 4 is a cable-ready program that hits the lats from a variety of angles with all cable moves. This keeps maximal tension on the muscles throughout the full range of motion. Reps are higher, and you should do drop sets on the last set of each cable exercise. Do this workout once per week with a split similar to the one used in phase 2. At the end of phase 4 you can switch to a more basic back workout using the split you typically train with.

Cannonball Delts Program

As with the back, having big, round, muscular shoulders can make your physique appear larger from every angle. Since the deltoid muscle is composed of three heads, a well-balanced shoulder program should target all three heads. The cannonball delts program (see table 7.12) drives growth in all three heads in order to build deltoids that are massive and balanced. Phase 1 starts with a basic strength and mass program done twice per week on Monday and Friday along with traps and abs. The Monday workout is a barbell blasting workout and the Friday workout is done with all dumbbells. Train legs and calves on Tuesday; chest, triceps, and abs on Wednesday; and back and biceps on Thursday. Both are done with low reps and low volume. Phase 2 drops the frequency back to once per week as the intensity is ratcheted up with high-rep, high-volume training that uses the preexhaust technique. Train chest, triceps, and abs on Monday; shoulders and traps on Wednesday; legs on Thursday; and back, biceps, and abs on Friday. Phase 3 splits the training up into one pressing workout on Monday and one raise workout done as a tri-set on Friday. Do this with the same training split used in phase 1. Phase 4 finishes off the delts with a once-a-week microcycle that blasts the delts with increasing reps each week and plenty of drop sets on the last set of each exercise.

Table 7.12 Cannonball Delts Program

Exercise	Sets	Reps
PHASE 1: WEEKS 1-4		
MONDAY		
Barbell push press	4	3-5
Seated barbell shoulder press	4	4-6
Wide-grip upright row	4	4-6
Barbell front raise	4	6-8
Barbell shrug	4	6-8
FRIDAY		
Standing dumbbell shoulder press	3	6-8
One-arm dumbbell lateral raise	3	6-8
Bent-over dumbbell lateral raise	3	6-8
Alternating dumbbell front raise	3	6-8
Dumbbell shrug	3	6-8
PHASE 2: WEEKS 5-8		
Cable front raise	4	12-15
Barbell shoulder press	4	8-10
Dumbbell lateral raise	4	10-12
Dumbbell shoulder press	4	8-10
Bent-over lateral raise	4	10-12
One-arm dumbbell shrug*	4	8-10
PHASE 3: WEEKS 9-12		
MONDAY		
Standing barbell shoulder press	4	8-10
Seated dumbbell press	4	8-10
Smith machine shoulder press	4	8-10
Behind-the-back barbell shrug	4	8-10
FRIDAY		
Bent-over dumbbell lateral raise	4	15-20
Dumbbell lateral raise	4	15-20
Dumbbell front raise	4	15-20
Seated dumbbell shrug	4	10-12

Cannonball Delts Program *(continued)*

PHASE 4: WEEKS 13-16								
	Week 13		Week 14		Week 15		Week 16	
Exercise	Sets	Reps	Sets	Reps	Sets	Reps	Sets	Reps
Barbell shoulder press	4	6	4	10	4	15	4	20
Dumbbell shoulder press	4	6	4	10	4	15	4	20
Dumbbell upright row	4	6	4	10	4	15	4	20
Cable lateral raise	4	6	4	10	4	15	4	20
Standing cable reverse fly	4	6	4	10	4	15	4	20
Dumbbell shrug	4	6	4	10	4	15	4	20

*Alternate right and left arm without resting until each arm has done four sets.

PART III

Training for Maximal Strength

Training for maximal strength is much different from training for muscle mass. From a training standpoint, the total volume and reps performed per set tend to be lower when training for strength compared to the volume and number of reps when training for muscle mass. From a physiological standpoint, muscle growth tends to be more about the aftereffects of training, while muscle strength also has a learning component that develops during the actual workouts. Even though mechanical stress and metabolic stress are important factors for developing muscle strength, there is a large component to strength development that relies on training of the nervous system.

Motor nerves that run from the spinal cord to the muscle fibers are responsible for initiating muscle contractions. Strength training increases muscle strength through several adaptations of the motor nerves. One mechanism involves training the motor nerves to fire at a faster rate. This allows the muscle fibers to contract with more force (that is, greater strength). Strength training also trains the motor nerves to fire at this faster rate for a longer period without fatiguing, This allows more reps to be done with a certain amount of weight. Another mechanism that leads to enhanced strength is synchronization of motor nerves. This refers to the ability of different motor nerves that control different muscle fibers within the same muscle to fire at the precise time to allow for the greatest production of muscle force.

What is similar between training programs for maximizing muscle strength and programs for maximizing muscle growth is that both trial and error in the gym and research in the laboratory have defined the training techniques and programs that work best at encouraging strength gains. Part III will teach you how to train for maximal strength. Chapter 8 covers basic workout design for building strength. This chapter starts with a lesson on weekly training splits that are optimal for building strength regardless of your training schedule. From there it progresses to general guidelines for training to maximize strength gains. Finally, it covers training tips and strategies for maximizing muscle strength on the three major strength lifts (bench press, squat, deadlift) as well as rules for training the core.

Chapter 9 introduces you to advanced training techniques that will have you lifting more weight in no time. These techniques work to increase mechanical and metabolic stress as well as enhance the firing rate and synchronicity of motor nerves.

Chapter 10 provides long-term periodized training cycles that are designed to help you continually improve your strength without plateauing. It starts by teaching you how to test your maximal strength, a critical component for assessing your progress over the course of any strength training cycle. From there, you can pick a training cycle that best fits your training experience and follow the sequencing cycles. Or you can follow a cycle that is specific to the exercise in which you want to boost strength. Regardless of your training experience or specific strength goals, this section covers everything you need to know to realize your strength potential.

CHAPTER 8

Tactics for Maximizing Strength

The first step toward getting stronger is learning how to develop workouts and basic training programs with that goal in mind. The variables you will need to consider for developing strength training workouts, as discussed in chapter 2, are the choice of exercises you will perform, the order of those exercises, how many sets of each exercise you will do, how heavy a weight you will use on those exercises, and how much rest you will allow between sets. Furthermore, you will also need to consider how often to train each muscle group and what type of training split you will employ.

This chapter focuses on the common training splits used by lifters interested in maximizing muscle strength. This will help you determine the best weekly schedule to follow for increasing muscle strength. From there the chapter steps back to focus on the variables of each workout. Then it steps back again to focus on the details of the specific exercises. Each step gives you more detail regarding guidelines, techniques, and tips for maximizing your muscle strength.

WEEKLY SPLITS

Regardless of whether your goal is to develop strength or muscle mass, the easiest way to split up your training is to work within the confines of the week. Although the body doesn't specifically follow a seven-day cycle, for practical purposes, a seven-day strength training cycle makes sense with most people's schedules. The following splits for developing strength all follow a seven-day cycle and will fit anyone's schedule and level of strength training experience.

One common denominator of these splits is that they focus on training three major strength lifts—the bench press (the marker for upper-body strength), squats (the marker for lower-body strength), and deadlifts (the marker for overall body strength). These also are the three lifts that are involved in powerlifting competition. Typically, the resistance used on these three exercises is expressed as a percentage of the weightlifter's one-repetition max (1RM), while all other exercises are expressed as an RM target zone—the resistance that limits a lifter to a specific number of repetitions. This is because powerlifters and others interested in training for strength frequently test their 1RM on the three major exercises.

Because training for maximal strength involves training with the three major strength exercises, as opposed to training a multitude of muscle groups, there tend to be fewer commonly used training splits. This does not mean that there are a limited number of ways to split up a strength training program. The following training splits are those that are well accepted by the majority of strength experts and athletes.

Whole-Body Strength Training

Whole-body strength training refers to single workouts that stress most major muscle groups of the body. This training split allows for most major muscle groups to be trained three times per week—usually Monday, Wednesday, and Friday. Many experts believe that frequency of training is important for gaining strength. In fact, many strength coaches have their athletes follow a whole-body training system. Not only do they

think the frequency of training is important, but most also believe that because the body works as a whole unit, it should be trained accordingly. Therefore, a whole-body strength training split can be an effective means of increasing overall strength.

The frequency offered by whole-body strength training is also beneficial for beginners. As discussed in chapter 5, this is because the initial adaptations made in a strength training program involve the training of the nervous system. The best way for beginners to train to build strength is to use slightly higher repetitions than trained lifters use and more frequent training of the same exercises to program their nervous systems.

The workouts on a whole-body split typically include one exercise per major muscle group. The exercise choices usually include the bench press, squat, and deadlift, or similar exercises that mimic those particular exercises, as well as assistance exercises that help with increasing strength on these particular exercises. Most weightlifters who use a whole-body split do not train small muscle groups (such as traps, forearms, and calves) in order to better concentrate on the muscles that are directly involved in the bench press, squat, and deadlift.

When you are following a whole-body training split, the first exercise of the workout should alternate between the bench press, squat, and deadlift. That way, each major strength exercise is trained once per week when the body is fresh. Some powerlifters also include one extra assistance exercise for the exercise they are focusing on in that workout. For example, in table 8.1, on Monday, leg press is done in addition to the squat.

Push–Pull Training Split

This split divides the workouts into pushing exercises and pulling exercises. Pushing exercises include any exercise in which the positive (concentric) portion of the exercise involves pushing or pressing the weight away from the body (such as in the bench press and shoulder press) or pushing the body away from the floor or platform (such as in the squat). Pull exercises include any exercise in which the positive (concentric) action involves pulling the weight toward the body (such as in the biceps curl, barbell row, or leg curl) or pulling the body toward a fixed object (such as in the pull-up).

Table 8.1 Whole-Body Strength Training Split

Exercise	Sets	% 1RM or reps
WORKOUT 1: MONDAY (SQUAT FOCUS)		
Squat	4	85%
Leg press	3	8-10
Incline bench press	4	6-8
Dumbbell shoulder press	3	6-8
Barbell row	3	6-8
Stiff-leg deadlift	3	6-8
Close-grip bench press	3	6-8
Dumbbell curl	3	8-10
Hanging leg raise	3	10-12
WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)		
Bench press	4	85%
Dumbbell bench press	3	8-10
Barbell hack squat	3	6-8
Barbell shoulder press	3	6-8
Deadlift	3	80%
Dumbbell row	3	8-10
Triceps dip	3	8-10
Barbell curl	3	6-8
Cable woodchopper	3	20
WORKOUT 3: FRIDAY (DEADLIFT FOCUS)		
Deadlift	4	85%
One-arm dumbbell deadlift	3	8-10
Bench press	3	8-10
Upright row	3	6-8
Lat pulldown	3	8-10
Lying triceps extension	3	6-8
Preacher curl	3	8-10
Back extension	3	15-20

The reason that some weightlifters split their workouts into push-and-pull workouts is that those exercises involve similar muscle groups working together to perform the exercise. For example, the pectoralis, deltoid, and triceps muscles are all used to varying degrees during the bench press and the shoulder press.

Push-and-pull training allows for each workout to be done twice a week for a total of four workouts per week, as shown in table 8.2. On push day, it is wise to alternate between the bench press and the squat as the starting exercise.

Upper- and Lower-Body Powerlifting Split

This split divides workouts into an upper-body workout day and a lower-body workout day. The upper-body exercises involve all exercises for major muscle groups of the upper body. The lower-body exercises involve all exercises for the major muscle groups of the lower body.

Table 8.2 Push–Pull Training Split

WORKOUT 1: MONDAY AND THURSDAY* (PUSH WORKOUT)		
Exercise	**Sets**	**% 1RM or reps**
Squat*	4	90%
Leg press	3	8-10
Leg extension	3	8-10
Bench press*	4	75%
Incline dumbbell press	3	8-10
Dumbbell shoulder press	4	6-8
Close-grip bench press	4	6-8
Standing calf raise	4	8-10
WORKOUT 2: TUESDAY AND FRIDAY (PULL WORKOUT)		
Deadlift	4	90%
Lying leg curl	3	8-10
Barbell row	4	6-8
Lat pulldown	3	8-10
Barbell curl	4	6-8
Weighted crunch	4	8-10

*On Thursday, perform bench press and incline dumbbell press before squats.

Like push–pull training, upper- and lower-body training allows each workout to be done twice per week for a total of four workouts per week (see table 8.3). Most powerlifters who follow this type of split use the two upper-body workouts to emphasize bench press training. In addition, they may use one workout to emphasize the pushing assistance muscles (such as shoulders and triceps), while the other upper-body workout focuses on the pulling assistance muscles (such as back and biceps). For lower-body workouts, most powerlifters split the

Table 8.3 Upper- and Lower-Body Powerlifting Split

UPPER-BODY WORKOUT 1: MONDAY (BENCH PRESS AND PUSHING EXERCISES)		
Exercise	**Sets**	**% 1RM or reps**
Bench press	4	90%
Dumbbell bench press	3	4-6
Barbell shoulder press	3	4-6
Upright row	3	6-8
Close-grip bench press	3	4-6
Dips	3	6-8
Standing crunch	3	8-10
LOWER-BODY WORKOUT 1: TUESDAY (SQUAT AND QUADRICEPS EXERCISES)		
Squat	5	90%
Leg press	3	4-6
Leg extension	3	6-8
Standing calf raise	4	8-10
UPPER-BODY WORKOUT 2: THURSDAY (BENCH PRESS AND PULLING EXERCISES)		
Bench press	5	75%
Lat pulldown	3	6-8
Barbell row	3	6-8
Barbell curl	4	6-8
Russian twist	3	20
LOWER-BODY WORKOUT 2: FRIDAY (DEADLIFT AND HAMSTRING EXERCISES)		
Deadlift	5	90%
Romanian deadlift	3	6-8
Lying leg curl	3	6-8
Good morning	3	8-10
Seated calf raise	4	10-12

two workouts into a squat emphasis and quadriceps assistance exercise workout and a deadlift emphasis and hamstring assistance exercise workout.

Max Effort–Dynamic Effort Training Split

This training split is basically a modified version of the upper- and lower-body powerlifting split. Each split trains the entire body in two days, which allows for four workouts per week. The major difference that separates max effort–dynamic effort from upper- and lower-body training split is the specific amount of resistance used during the max effort–dynamic effort split. For details of the max effort–dynamic effort method, see chapter 9.

With the max effort–dynamic effort training split, the first two workouts of the week are done using the max effort system (see table 8.4). This calls for a gradual buildup of weight on each successive set of the bench press, squat, or deadlift until you reach 90 to 95 percent of 1RM. Some lifters go to 100 percent on some workouts.

During the last two workouts of the week, the weight used on the bench press, squat, and deadlift is only 50 to 60 percent of the 1RM. Although most people can lift this amount of weight for about 20 reps, these sets stop at 3 to 5 reps. The key is in the rep speed at which they are performed. During the dynamic effort workouts, these reps are performed as fast as possible.

Table 8.4 Max Effort–Dynamic Effort Training Split

LOWER-BODY WORKOUT 1: MONDAY—MAX EFFORT

Exercise	Sets	Reps	% 1RM
Squat	1	5	10%
	1	5	20%
	1	5	30%
	1	3	40%
	1	3	50%
	1	3	60%
	1	1	70%
	1	1	80%
	1	1	90%
	1	1	95%
	1	1	100%
Deadlift	1	5	10%
	1	5	20%
	1	5	30%
	1	3	40%
	1	3	50%
	1	3	60%
	1	1	70%
	1	1	80%
	1	1	90%
	1	1	95%
	1	1	100%

UPPER-BODY WORKOUT 1: TUESDAY—MAX EFFORT

Exercise	Sets	Reps	% 1RM
Romanian deadlift	3	4-6	85%
Barbell good morning	3	6-8	80%
Exercise-ball roll-out	3	12-15	Body weight
Bench press	1	5	10%
	1	5	20%
	1	5	30%
	1	3	40%
	1	3	50%
	1	3	60%
	1	1	70%
	1	1	80%
	1	1	90%
	1	1	95%
	1	1	100%
Dumbbell bench press	3	4-6	85%
Barbell shoulder press	3	4-6	85%
Close-grip bench press	3	4-6	85%
Barbell row	3	4-6	85%
Barbell curl	3	6-8	80%
Hanging knee raise	3	10	Body weight

LOWER-BODY WORKOUT 2: THURSDAY—DYNAMIC EFFORT			
Exercise	Sets	Reps	% 1RM
Squat	2	5	10%
	1	5	20%
	1	3	30%
	1	3	40%
	8	3	50%
Deadlift	2	5	10%
	1	5	20%
	1	3	30%
	1	3	40%
	8	3	50%
Romanian deadlift	3	8-10	75%
Barbell good morning	3	8-10	75%
Russian twist	3	15-20	Body weight
UPPER-BODY WORKOUT 2: FRIDAY—DYNAMIC EFFORT			
Bench press	2	5	10%
	1	5	20%
	1	3	30%
	1	3	40%
	8	3	50%
Dumbbell bench press	3	8-10	75%
Barbell shoulder press	3	8-10	75%
Close-grip bench press	3	8-10	75%
Barbell row	3	8-10	75%
Barbell curl	3	8-10	75%
Decline crunch	3	12	Body weight

Squat–Bench Press–Deadlift Training Split

Some weightlifters split their training into three workouts per week: one squat-focused workout, one bench press–focused workout, and one deadlift-focused workout. This way each major lift gets an equal amount of training time focused on it. Usually the squat workout is performed first in the week to allow ample time for recovery before the deadlift workout, which also uses the leg muscles to a great extent. The squat workout is usually accompanied by assistance exercises that train the quadriceps, hamstrings, and sometimes the calf muscles. The second workout (performed no sooner than 48 hours after the squat workout) is typically the bench press workout. This workout usually involves assistance pressing exercises that target the chest, shoulders, and triceps muscles. The third workout (performed no sooner than 48 hours after the bench press workout) is the deadlift workout. In addition to the deadlift, this workout often includes assistance pulling exercises that train the back and biceps muscles. See table 8.5 for a sample squat-bench press–deadlift training split.

Table 8.5 Squat–Bench Press–Deadlift Training Split

WORKOUT 1: SQUAT DAY (MONDAY)		
Exercise	Sets	Reps
Squat	4	85%
Leg press	3	6-8
Leg extension	3	8-10
Standing calf raise	3	8-10
Cable woodchopper	3	20
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	4	85%
Incline dumbbell press	3	6-8
Barbell shoulder press	4	6-8
Close-grip bench press	4	6-8
Standing crunch	4	8-10
WORKOUT 3: DEADLIFT DAY (FRIDAY)		
Deadlift	4	85%
Good morning	3	6-8
Lying leg curl	3	8-10
Barbell row	4	6-8
Barbell curl	4	6-8

Changing Your Strength Split

The strength training splits covered in the previous section have little differences among them. All focus on training the three major strength lifts; a secondary focus is on training the assistance exercises for these three strength lifts. Because of this, changing the strength training split every few months is one way to institute another form of variation in the training program. However, most competitive powerlifters have one training split that they stick with year round. Therefore, if you find a certain training split that works better for your schedule, you can potentially use it endlessly.

ESSENTIALS OF STRENGTH PROGRAMS

The type of training split you decide to follow is not as critical a factor for successful strength gains as the proper choice of exercises, exercise order, resistance, and volume. Regardless of the split you employ for developing strength, there are certain rules of success to follow. Follow these general rules to ensure that your training is optimal for strength gains. In addition, the three major strength lifts are covered in detail. That's because you can't properly increase your strength on these lifts without being proficient in the proper technique for each. Last but not least, the chapter covers core training. You must have a strong core to transfer strength to the limbs. Once you have these fundamentals of strength training, you will be ready to advance to the techniques for boosting strength (chapter 9).

General Rules of Strength Training

Training for muscle mass uses exercises as a means to an end. Training for maximal strength, on the other hand, does not use exercises merely as tools. Instead, training for strength is about increasing performance on the exercises. For most weightlifters, the exercises they train are the bench press, squat, and deadlift. Therefore, the first and most obvious rule is that you should include these three exercises in your program. You should also include assistance exercises to help you boost strength on the bench press, squat, and deadlift. These choices involve multijoint compound exercises, where appropriate.

Order of exercises is important as well—the bench press, squat, and deadlift should each be performed first in the workout at least once per week. Following the major lift should be the assistance exercises. The second exercise should be a compound exercise that targets the major muscle group used in each of the three exercises. The third exercise and any others that follow should be those that target muscle groups that assist the major strength exercise.

The amount of resistance used is of paramount importance to your strength gains. For the three major strength exercises, the resistance used is typically expressed as a percent of the 1RM. This is convenient because the 1RM for these lifts is frequently tested by those who are interested in increasing their maximal strength. For strength gains, the majority of training time should be spent using a load between 85 and 95 percent of the 1RM. Of course, cycling the training load is wise for making continued gains in strength. In fact, loads as light as 50 percent RM are often used by weightlifters to increase power, which helps to boost strength. The resistance for the assistance exercises is usually expressed as a specific repetition maximum (RM). These will often correspond with the percent RM. For example, if the squat is being trained with 85 percent of the RM, the leg press should be performed using a rep range of about four to six. Regardless of the exercise, muscle failure should be reached only on one set per exercise at the maximum. Many powerlifters rarely, if ever, train to muscle failure. However, research from Australia suggests that training to muscle failure on one set per exercise and no more is better for strength gains than not training to failure or training to failure two or more times per exercise (Drinkwater et al. 2005).

Volume per workout is generally low when training for strength. For the major strength exercises, typically as few as three to as many as eight sets are done per exercise. For assistance exercises, usually three or four sets are performed per exercise. For an entire workout, total volume can be as low as 12 to as high as 30 sets or more, depending on the split being used and the training phase.

When it comes to training rules, nowhere are they more critical than when training for maximal

strength. Research and years of experience support a narrow spectrum of exercise choices, exercise order, resistance, volume, and even rest periods that are effective in the quest for strength. Yet, as the saying goes, rules are meant to be broken. As important as it is to follow rules for strength training, breaking from the norm from time to time can be an effective means of improving strength. This is especially true during plateaus, when standard training practices fail to work. The training strategies in chapter 9 will challenge the tried-and-true rules that most strength athletes have adopted as standard training guidelines. Knowing how and when to use them will make a world of difference in the strength gains you can expect from your training program.

Bench Press Training

To many people, strength is all about the bench press. Rarely does a heavily muscled athlete field the question "How much can you squat?" The question everyone wants to know is "How much can you bench-press?" Of course, masculinity is often associated with strong and well-developed upper-body musculature, and the bench press is the marker for this strength. The bench press develops the major muscles of the upper body—chest, shoulders, triceps, and even the back to some extent.

Another reason so many people associate strength solely with the bench press may be the fact that of the three major strength exercises, the bench press is the easiest to perform. Almost anyone can walk into a gym and bench-press with relative ease and safety. Whatever the reason, the bench press is the preeminent strength exercise.

When it comes to training strategies for boosting strength in the bench press, regardless of the training split being used, exercise choice and order are critical factors. Of course, strength in the bench press cannot be optimally enhanced without actually performing the bench press regularly. This is known as the specificity principle. On bench press training days, you should perform the bench press first while the muscle fibers are fully recovered from any previous exercise. This ensures that the muscles can handle the maximal load they are capable of for the specific number of reps prescribed for that workout.

After the bench press, you should do one other chest-pressing assistance exercise, such as the incline or decline barbell press or dumbbell press (flat, incline, or decline). On occasion, you can do chest isolation exercises instead. However, isolation exercises are rarely used unless the weightlifter is in the hypertrophy phase of training. This is because the isolation exercises do not mimic the pressing motion of the bench press. Chest exercises are usually followed with one shoulder exercise and one triceps exercise. These are preferentially compound exercises, such as shoulder press or upright row for shoulders and dips or close-grip bench press for triceps. On occasion these can be isolation exercises. Depending on the split used, one back and one biceps exercise may conclude the bench press workout, or you may train these on separate pull exercise days. See table 8.6 for a sample bench press workout.

Sets performed on the bench press should typically fall in the range of three to five, not including warm-up sets. All assistance exercises are usually limited to three sets per exercise. The weight used on the bench press should start off light (10 to 50 percent RM) and gradually work up to the heavy sets in the range of 85 to 95 percent RM. This is the range that most workouts are performed in, depending on the training phase. Weight may go as high as 100 percent RM to as low as 50 percent RM for some working sets during specific training phases of the cycle. For the assistance exercises,

Table 8.6 Big Bench Day

This workout is for a powerlifter who has a maximum bench press of 495 pounds and is training with 90 percent of his or her maximum.

Exercise	Sets	Weight (pounds)	Reps	Rest
Bench press	1	135	10*	1 min
	1	225	8*	1 min
	1	315	6*	2 min
	1	365	5*	2 min
	1	405	3*	3 min
	3	445	3**	3-4 min
Incline dumbbell press	3	375	4-6**	3 min
Barbell shoulder press	3	255	4-6**	3 min
Close-grip bench press	3	385	4-6**	3 min
Standing crunch	4	110	8-10**	1 min

*Warm-up sets.
**Working sets.

Big Bench Tips

Use these tips to help you lift more on the bench press:

SETUP

Lie on a bench-press bench with your feet flat on the ground wider than shoulder-width apart. This helps to stabilize your body. Your knees should be bent at about a 90-degree angle.

Maintain a slight arch in your lower back throughout the exercise and keep your shoulders and glutes pressed into the bench. Keep your glute muscles tightly contracted during the entire exercise.

GRIP

Take a grip that is slightly wider than shoulder width on the bar. To determine the best grip for your arm length, make sure that when the bar reaches your chest there is a 90-degree angle at the shoulder and the elbow.

Be sure to wrap your thumb around the bar. This prevents you from flexing the wrist back too much, which could decrease force production traveling through the forearm and therefore overall bench press strength.

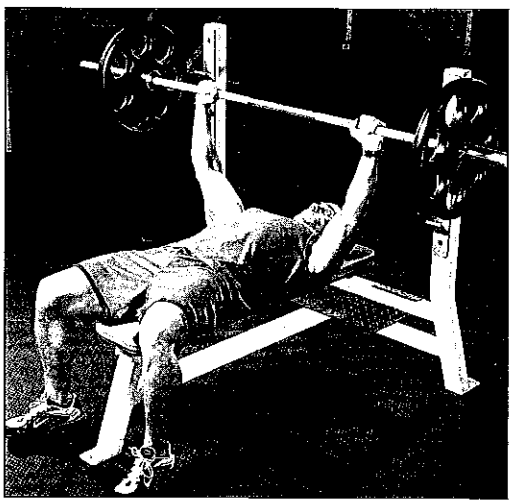
Make sure you squeeze the bar as hard as possible. This creates a solid connection to the bar by allowing the force developed by the chest, shoulder, and triceps muscles to be more effectively transmitted to the bar.

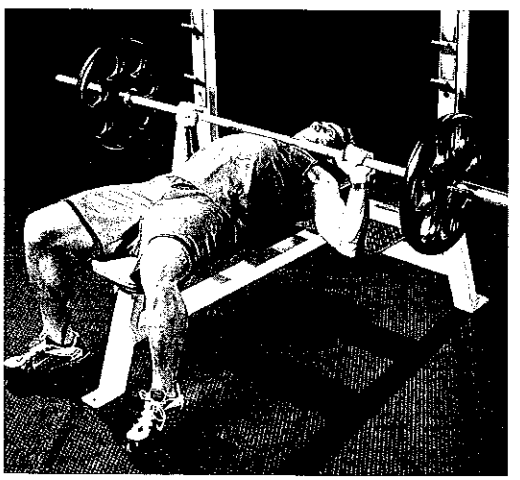
LOWERING THE BAR

Lift the bar off the rack to the point where it is over your upper chest. This is your starting position.

Squeeze your scapulae together while lowering the bar. This stabilizes the shoulder girdle and will help you recruit the lats to push the weight up.

Lower the bar slowly. This allows the stored energy from the descent and the elastic properties of the muscles to produce more force on the lift.





ARMS

Your upper arms should form a 45- to 60-degree angle with your torso as you lower and press the weight back up.

TOUCHDOWN

When the bar reaches your chest, it should touch across the nipples, not much lower.

PRESSING THE BAR

Before you push the weight back up, dig your shoulders into the bench and keep your butt on the bench. This stabilizes your shoulder capsule and keeps the bar moving upward in a straight line.

You need to explode the weight off your chest as quickly and powerfully as possible. Think about blasting the bar off your chest as if it weighed just 10 pounds, even though, in reality, the bar will move quite slowly. The neural drive that results from attempting to move the bar as quickly as possible will recruit more high-threshold muscle fibers.

Press the bar as straight up as possible. As you press the bar up, try to rip the bar apart by pulling your arms outward without changing your grip on the bar.

LEGS

Although the bench press is an upper-body exercise, don't forget to use your legs. When you press the weight with your arms, you should also drive the weight with your legs to transfer more force to your upper body.

BREATHING

Take a big breath in and hold it as you lower the weight and start it on its return. This causes an increase in pressure in your chest and abdominal cavity, which better supports your body and allows your muscles to produce more force. It also expands the chest, shortening the distance the bar has to travel.

Exhale after passing the most difficult stage of the lift or after you reach the top position.

reps typically correspond with the percent RM being used in that workout on the bench press. So reps tend to fall mostly in the range of 2 to 10 reps for assistance exercises, depending on the training phase.

Rest periods between sets should be longer than when training for muscle size. The exact time is not as critical as the fact that the body is mostly recovered from the previous set. When training for strength, fatigue is not as critical as it is for building muscle size. Therefore, resting anywhere from two to five minutes is common practice. A detailed description of the proper exercise technique for the bench press exercise can be found in the sidebar on page 150 also on page 224 in chapter 11. Technique is a critical factor when training for strength. The program you follow will not matter much to your strength gains if you do not perfect your technique in the bench press.

Squat Training

The squat is the exercise that defines lower-body strength. Although it's categorized as a leg exercise, the squat technically functions as a whole-body strength and mass builder. More than 200 muscles are involved in executing the squat. In addition, the surge in growth hormone and testosterone that accompanies the squat as compared to other exercises means it enhances the strength and growth of all muscles. Many great bench pressers espouse the importance of doing squats, if for nothing more than enhancing bench press strength.

To increase squat strength, the first critical component of any training program is the exercise choices and order. Simply stated, you have to actually squat to increase squat strength. On workouts that emphasize squat training, the squat should be the first exercise performed. When you're training for strength, the amount of weight you use is a critical factor for strength gains. Therefore, you should do the squat first, when the muscles are not fatigued and are at their strongest.

You should follow the squat with one assistance squat or leg press exercise (such as the leg press or squat machine) and occasionally an isolation exercise for quadriceps (such as the leg extension). In addition, many weightlifters also perform one or two calf exercises at the end of their squat workouts. This is sensible, since the calf muscles are involved during the squat.

Total sets performed during squat workouts should be about three to five, not including warm-up sets. All assistance exercises are usually limited to three sets per exercise. Weight for the squat exercise should progressively increase from light warm-up sets with weight around 10 to 50 percent RM to heavy working sets of 85 to 95 percent RM. This is the range that most squat workouts are performed in, depending on the training phase the lifter is in. On the upper end, the weight used for training may go as high as 100 percent RM for squats. On the low end, the weight used may be reduced to 50 percent RM for working sets, such as during training phases that increase power. For the assistance exercises, reps typically correspond with the percent RM used in that workout on the bench press. So reps tend to fall mostly in the range of 2 to 10 reps for assistance exercises, depending on the training phase. Rest periods between sets usually last about two to five minutes. See table 8.7 for a sample squat training workout. A detailed description of the proper exercise technique during the squat is covered in chapter 18. Proper form is essential for maximal strength on the squat; the sidebar on page 152 presents tips for increasing squat strength.

Table 8.7 Squat Day

This squat workout is for a powerlifter who has a maximum squat of 565 pounds and is training with 90 percent of his or her maximum (510 pounds).

Exercise	Sets	Weight (pounds)	Reps	Rest
Squat	1	135	10*	1 min
	1	225	10*	1 min
	1	315	8*	2 min
	1	365	8*	2 min
	1	405	6*	3 min
	1	455	4*	3 min
	3	510	3**	4 min
Leg press	3	720	4-6**	3 min
Leg extension	3	210	4-6**	2 min
Standing calf raise	3	330	8-10**	1 min

*Warm-up sets.
**Working sets.

Squatters' Rights

Closely follow these tips for safe execution of the squat:

SETUP

Position a bar on a squat rack or power rack to about mid-chest height.

Hold the bar with a wide overhand grip and duck under it so that your neck is directly in the middle of the bar. Push your back up into the bar so that the bar is no more than two inches below the top of your shoulders.

Stand up with the bar on your back to unrack it and step back from the rack.

GRIP

Hold the bar with an overhand grip and wrap your thumbs around the bar. Bring your hands in as close to your shoulders as possible.

Use your hands to press the bar against your back and pull your shoulder blades together and your elbows forward to support the bar.

HEAD

Keep your head aligned with your spine by keeping it up and looking straight ahead.

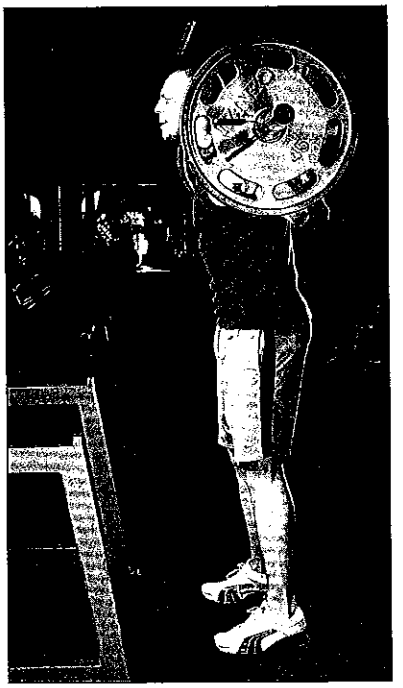
TORSO

Maintain the arch in your lower back and pull your shoulders back while pushing your chest up and out.

Isometrically contract your spinal erector muscles and abdominals to keep your core tight.

STANCE

Place your feet shoulder-width apart or wider—this depends on your preference. Individual biomechanics come into play, and you must find the foot position that is most comfortable for you. If your feet are too close together, it makes it difficult for the hamstrings and glutes to properly assist the quads. If your feet are too wide apart, the opposite will occur and your quads will not be able to assist.



If you have long legs, going much wider than shoulder width tends to be more comfortable and more biomechanically advantageous. If you are of average height and have legs that are proportional to the length of your upper body, will likely be comfortable with your feet just slightly wider than shoulder width. If you have short legs, a shoulder-width stance will probably be most comfortable.

Maintain a slight bend in your knees and isometrically contract your quads, hamstrings, and glutes before descending.

DESCENT

To descend, stick your glutes out and descend as if you were to sit down on a chair until your thighs are parallel to the floor.

Keep your hips under the bar as much as possible to avoid excessive forward lean of your torso.

Be sure that your heels do not come off the floor.

ASCENT

Transition from the descent to the ascent by driving forcefully upward with the legs.

Concentrate on moving your hips first before your knees. As you push up, force your knees out hard and push out on the sides of your shoes while you squat. This helps to keep the tension in your hips for greater strength.

As you ascend, thrust the head back. Don't lift your chin up; just push your head back to help contract your traps.

BREATHING

Take a big breath in and hold it as you descend into the squat.

Exhale as you pass the most difficult stage of the squat.

Deadlift Training

The deadlift is considered the best indicator of overall body strength. Because you must hold the bar in the hands while driving it upward from the floor with the legs, it truly involves a majority of the body's musculature. It is called the deadlift because the weight is lifted from the floor. This eliminates the eccentric motion that precedes most exercises such as the squat and bench press. The eccentric motion aids the force that is produced by the muscles during the concentric phase of a lift. Therefore, the deadlift is a much more difficult lift than the squat.

As with the squat and bench press, to increase your strength on the deadlift, you must train the deadlift. This means that you must devote at least one workout per week to specific deadlift training. You should perform the deadlift first in the workout when the muscles are strongest and not fatigued. Many powerlifters follow the deadlift exercise with assistance hamstring exercises such as the Romanian deadlift or leg curl. Depending on the training split used, many powerlifters also train back and sometimes biceps on deadlift day. This strategy makes sense, since these muscle groups are used during the deadlift.

Usually about three to five sets, not including warm-up sets, are performed for the deadlift. All assistance exercises, such as the leg curl, are usually limited to three sets per exercise. As with the other two strength exercises, the weight on the deadlift should progressively increase from very light warm-up sets (weight around 10 to 50 percent RM) to heavy working sets (ranging from 85 to 95 percent RM). This is the range that most lifters use in training the deadlift. However, the weight used during some workouts may go as high as 100 percent RM or as low as 50 percent RM for working sets. For assistance exercises, reps typically correspond with the percent RM being used in that workout on the deadlift. So reps tend to fall mostly in the range of 2 to 10 for assistance exercises, depending on the training phase. Rest periods between sets usually last about two to five minutes. See table 8.8 for a sample deadlift training workout. A detailed description of the proper exercise technique during the deadlift is covered on page 366 of chapter 22. Proper form is essential for developing maximal strength in the deadlift. The sidebar on page 154 presents tips that will ensure you are performing the deadlift most effectively for maximal strength.

Table 8.8 Day of the Deadlift

This deadlift workout is for a powerlifter who has a maximum deadlift of 505 pounds and is training with 90 percent of his or her max.

Exercise	Sets	Weight (pounds)	Reps	Rest
Deadlift	1	135	10*	1 min
	1	225	10*	1 min
	1	315	8*	2 min
	1	365	8*	2 min
	1	405	6*	3 min
	1	455	4*	3 min
	3	505	3**	4 min
Romanian deadlift	3	315	4-6**	3 min
Leg curl	3	180	4-6**	2 min

*Warm-up sets.
**Working sets.

Abdominal and Low-Back Training

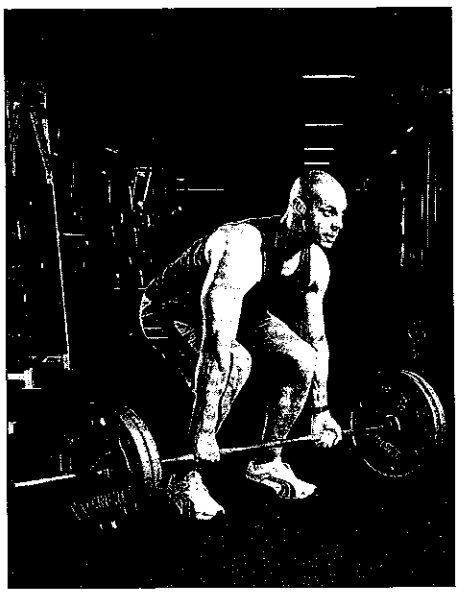
Powerlifters and other strength athletes do train their abs. However, unlike the bodybuilder who is interested in developing the musculature of the abdominals to chisel a well-defined six-pack, the strength athlete is interested in developing the strength of the abdominal musculature. The same can be said about the low back. Both the superficial and deep muscles of the abdominals and low back make up the core musculature of the body. These muscles support the shoulders, spine, and hips during all movements. Building the strength of these muscles not only helps to prevent back injuries but can help to increase strength due to the fact that the body's foundation is stronger. For a complete listing and exercise description of the abdominal and core exercises, see chapter 21. For exercises of the low back, see chapter 13.

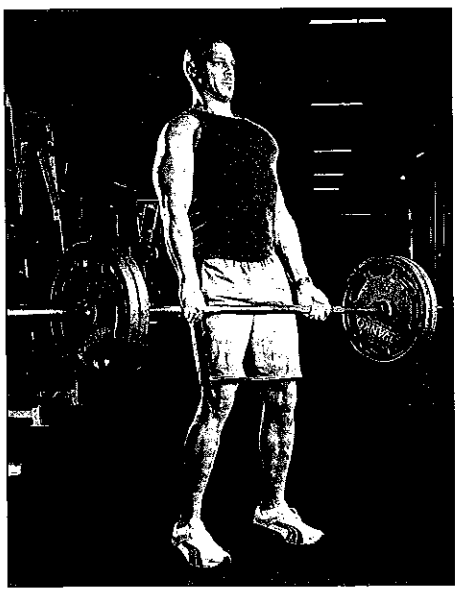
You should do core, abdominal, and low-back exercises toward the end of workouts to prevent fatiguing of the core musculature before doing the major strength exercises with heavy weights. Many powerlifters do one or two core, abdominal, and low-back exercises at the end of two to four workouts per week. Some even have a distinct core training day.

Core exercises, if included in a workout, are usually trained first in the series with abdominal and low-back exercises. The number of reps varies

Life of the Deadlift

Closely follow these tips to execute the deadlift safely and effectively. Two styles of deadlift—the regular-stance deadlift and the sumo-stance deadlift—are acceptable in competition. The regular-stance version has the feet a little closer than shoulder-width apart, whereas the sumo-stance deadlift has the feet spaced apart much wider than shoulder-width. There is no concensus that has established the clear benefits of one form over the other. Therefore, the choice is pure preference of the individual. Both styles are covered in the following description.





SETUP

Set up a barbell on the floor with the desired amount of weight.

Approach the loaded barbell until your shins are touching the bar.

LEGS

Your stance should be about as wide as your own shoulders or narrower for the regular-stance deadlift. For the sumo-stance deadlift, the feet should be much farther apart than shoulder width.

For the regular-stance deadlift, toes should point straight forward or slightly out (25 degrees at most). For the sumo-stance deadlift, toes should point out to about 30 to 40 degrees.

Squat down to a position that is similar to the bottom position of the squat. However, in the regular-stance deadlift the thighs will be slightly higher than parallel to the floor. With the sumo-stance deadlift, the thighs will be about parallel to the floor. Most of your weight should be on the heels of the feet to facilitate maximal contribution of the glutes and hamstrings.

GRIP

Regardless of the style used, your grip should be a staggered grip. That means one hand should be an underhand grip and the other hand should be an overhand grip. This helps to prevent the bar from slipping out of the hands.

For the regular-stance deadlift, the arms will hang straight down and just outside of your thighs. For the sumo-stance deadlift, the arms hang straight down on the insides of the thighs.

TORSO

For the regular-stance deadlift, the upper body should lean slightly forward at about a 45-degree angle to the floor.

For the sumo-stance deadlift, the upper body is slightly more upright than in the regular-stance deadlift (about a 50- to 60-degree angle to the floor).

Regardless of the style used, the shoulder blades should be pulled together tightly throughout the entire exercise.

Isometrically contract your low-back muscles to maintain the natural arch in your lower back. Keep your abs tightly contracted throughout the lift.

HEAD

The head should remain in a straight line with the back. To do this, pick a point on the floor about five to six feet ahead of you and focus on that point.

ASCENT

As you stand up with the weight, imagine pushing the floor away from you with your feet.

Your hips and shoulders should ascend together.

During the ascent, the bar will travel as close to the shins and legs as possible

LOCKOUT

You have reached the finish point when you have full extension of the knees, hips, and back. The lockout position should position the front part of your shoulders behind the front part of your hips.

BREATHING

Take a big breath in and hold it as you prepare to ascend.

Exhale as you pass the most difficult stage of the deadlift.

Inhale again at the top and hold your breath before the return.

DESCENT

Carefully return the bar to the floor by reversing the techniques used in lifting the weight up.

depending on the type of exercise. For core and low-back exercises, higher reps in the range of 20 to 30 are acceptable. However, many powerlifters train the good morning exercise with extremely heavy weight and lower reps in the range of 6 to 12. For ab exercises, many powerlifters also prefer to train with heavier weight and lower reps (8 to 10) to increase abdominal muscle strength. See table 8.9 for a sample core program that can be performed twice per week at the end of typical strength workouts, with at least 48 hours of rest between workouts. It includes one core exercise, one low-back exercise, and one abdominal exercise per workout.

Table 8.9 Getting to the Core

WORKOUT 1			
Exercise	**Sets**	**Reps**	**Rest**
Dumbbell woodchopper	3	20	1 min
Lying back extension	3	25	1 min
Standing crunch	3	8-10	1 min
WORKOUT 2			
Russian twist	3	25	1 min
Barbell good morning	3	8-10	2 min
Hanging leg raise	3	10-12	1 min

CHAPTER 9

Programs for Maximizing Strength

Training to maximize strength tends to be a much simpler pursuit than training to maximize muscle mass. The basic workout samples provided with the training splits discussed in chapter 8 are from tried-and-true training programs that work exceptionally well when the resistance used and reps performed are cycled. However, as the saying goes, everything works, but nothing works forever. And so, when a standard program fails to deliver the strength gains you expect, it's time to try something out of the ordinary.

This chapter covers strength training methods that are effective for maximizing muscle strength. As in chapter 6, the techniques are categorized by the type of acute variable of training that is being manipulated in each workout. Also as in chapter 6, each technique is rated on a scale of 1 to 5 for four critical areas:

1. **Time**—the amount of time that the specific workout typically takes to complete. This helps you immediately determine if this training technique will fit your training schedule. The higher the number, the longer the workouts for that specific technique will take to complete.
2. **Length**—the amount of time required to follow the program consistently for appreciable results to be noticed. This helps you determine if you have the patience required for a certain program to demonstrate adequate results in strength. The higher the number, the longer this technique must be followed for results to be realized.
3. **Difficulty**—the amount of weightlifting experience required to use the program effectively. This helps you decide if you have enough training experience to take on specific strength training techniques. The higher the number, the more training experience you should have before attempting that particular technique.
4. **Results**—how effective the program seems to be for strength gains in most people. This helps you estimate how much strength you can expect to gain with each program. The higher the number, the greater the gains in strength you can expect from a particular program.

Each strength training method provides a sample table to show how this particular technique can be used. Some of these tables provide full training programs complete with sample workouts to be followed over several weeks. Others provide only brief details on cycling weight throughout the program. For these you are encouraged to use a basic training program, as shown in chapter 8, but incorporate the weight, rep, set, or rest changes as outlined in the sample program table. Try the advanced strength training programs discussed in chapter 9 by cycling them into your training program along with the basic programs discussed in chapter 8. These advanced programs are great to turn to when your strength gains have reached a plateau. The unorthodox nature of many of these programs will offer a unique stimulus to the muscles, which will encourage strength gains. In the programs, weights are given in pounds; please see appendix for metric conversions.

PROGRAMS THAT MANIPULATE SETS

When it comes to quantifying the strength training workout, the set is the unit that all lifters understand. It signifies how much work you are actually doing. Therefore, manipulating the work in a workout is a logical way to alter workouts in an effort to boost strength. This section covers three strength training techniques that alter the sets during a workout. The first method incorporates sets that are completed only when the muscle is too exhausted to complete another rep. The second method involves using a set system that is based on time. The third method decreases the number of sets it takes to complete a set number of reps.

Failure Training

As defined in chapter 1, muscle failure is the point during an exercise at which the muscles have fully fatigued and can no longer complete an additional rep of that exercise using strict form. While bodybuilders tend to complete all their sets to failure, powerlifters rarely, if ever, train to muscle failure. In fact, the programs in chapter 8 are not meant to be used with muscle failure. Each set is done for a certain number of reps with a certain amount of weight. When the number of reps prescribed for that set are completed, the set is over. In most cases, you will feel as though you could have completed at least one more rep. This is how most powerlifters train to increase muscle strength. Many believe that training to muscle failure can hinder strength gains. However, research from Australia suggests that training to muscle failure may enhance strength gains. The key appears to be the number of sets performed to failure—and that number appears to be one.

Australian researchers discovered that when trained lifters completed one set to failure of the four sets they trained with on the bench press for eight weeks, they had double the strength gains of lifters who did not complete any of the four sets to failure. And in a follow-up study, they discovered that doing more than one set to failure on the bench press for eight weeks offered no additional increase in strength gains. In fact, when comparing the two studies, the strength gains reported in the study using multiple sets to failure were less impressive than the strength gains reported in the study using just one set to failure. The reason may be that performing only one set to failure allows for enough stimulus to be delivered to the muscle fibers without the risk of overtraining, which can happen when training with too many sets to failure.

Taking advantage of this knowledge is rather simple. Choose any basic strength training program offered in chapter 8 and be sure to perform the last set, and only the last set, of every exercise (except the abdominals) to muscle failure. See table 9.1 for a sample training program that takes the last set of each exercise to failure. One caveat about training to failure is safety. For obvious reasons, it is not a method to be used by those who train alone, except when done with exercises that use machines or where it is easy to return the weight to a safe location—such as the deadlift, dumbbell bench press, Smith machine squat, or barbell curl. Under no circumstances should anyone training alone perform any barbell pressing exercises, barbell squat, leg press, or hack squat to failure or close to failure. These exercises all require the help of an adequate spotter to ensure that the last rep is done accurately and safely.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	3	**4**	5

Table 9.1 Failing for Strength

Exercise	Sets	Reps
WORKOUT 1: SQUAT DAY (MONDAY)		
Squat	1	10 with 50% RM
	1	6 with 60% RM
	1	5 with 75% RM
	3	5 with 85% RM
	1	To failure with 85% RM
Leg press	2	6
	1	To failure with same weight as sets 1 and 2
Leg extension	2	8
	1	To failure with same weight as sets 1 and 2
Standing calf raise	2	8
	1	To failure with same weight as sets 1 and 2
Cable woodchopper	3	20
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	1	10 with 50% RM
	1	6 with 60% RM
	1	5 with 75% RM
	3	5 with 85% RM
	1	To failure with 85% RM
Incline dumbbell press	2	6
	1	To failure with same weight as sets 1 and 2
Barbell shoulder press	2	6
	1	To failure with same weight as sets 1 and 2
Close-grip bench press	2	6
	1	To failure with same weight as sets 1 and 2
Standing crunch	4	8-10
WORKOUT 3: DEADLIFT DAY (FRIDAY)		
Deadlift	1	10 with 50% RM
	1	6 with 60% RM
	1	5 with 75% RM
	3	5 with 85% RM
	1	To failure with 85% RM
Good morning	2	6
	1	To failure with same weight as sets 1 and 2
Lying leg curl	2	8
	1	To failure with same weight as sets 1 and 2
Barbell row	2	6
	1	To failure with same weight as sets 1 and 2
Barbell curl	2	6
	1	To failure with same weight as sets 1 and 2

Time Under Tension

Time under tension (TUT) refers to a different way to define a set. Instead of a set being defined by the number of reps performed, a TUT set is defined by the length of time it takes to complete the set. The time it takes to complete the set is referred to as the time the muscle is under tension. Tension refers to the resistance from the weight being used. The amount of time spent doing each set for an exercise can be a critical component to increasing strength. Consider a set of five reps on the bench press. If the five reps each took about 2 seconds to lower the weight and another 2 seconds to press the weight back up, that's 4 seconds per rep. Five reps at this pace would take a total of about 20 seconds to complete the set. In other words, the TUT for that set would be 20 seconds. If the time to complete each of those five reps were increased to 6 seconds, the TUT of that set would increase to 30 seconds. Although the number of reps and the amount of weight are the same on each of these sets, the first set with a TUT of 20 seconds is actually better for increasing strength.

Just as it is well established that muscle strength is best developed by training with a rep range of 1 to 6 per set, and muscle growth is best attained with a rep range of about 8 to 12, some strength training experts believe that the total time a set takes to complete may be just as important as the number of reps completed per set. Although no controlled research has yet been done to determine the best TUT ranges for developing strength or muscle mass, anecdotal evidence from strength trainers suggests that the best TUT range for strength is about 4 to 20 seconds per set and about 40 to 60 seconds per set for muscle growth. Table 9.2 shows you the optimal rep range and TUT for the desired muscle adaptation. The last column lists the time per rep range to complete the set within the optimal TUT.

Regardless of the importance of TUT for muscle adaptations, no one has suggested that TUT ranges should replace optimal rep ranges. Instead, combining both TUT and optimal rep ranges within a set may be a more precise way to prescribe how much work should be placed on a muscle to induce the desired adaptations. Using the bench press as an example, if five reps (which is within the optimal rep range for strength gains) were performed at 4 seconds per rep, the entire set would take 20 seconds to complete. That set would meet both the requirements for the optimal rep range and optimal TUT range to stress a muscle for maximizing strength gains. However, training for maximal strength using TUT allows you to increase the rep range a bit beyond the optimal rep range for maximal strength, as long as the TUT range per set meets the requirements for maximal strength. This allows for more variety in the training program while still staying on target for inducing strength gains.

To train for maximal strength using TUT, keep your rep range at one to eight reps per set and the TUT range at 4 to 20 seconds per set. Both the rep range and TUT range should change frequently, as any good periodized program should. See table 9.3

Table 9.2 Rep Time

Muscle adaptation	Optimal rep range	Optimal TUT	Seconds per rep
Strength and power	1-6	4-20 seconds	1 rep: 4-20 2 reps: 2-10 3 reps: 2-6 4 reps: 1-5 5 reps: 1-4 6 reps: 1-3 7 reps: 1-2 8 reps: 1-2
Muscle growth	6-15	40-60 seconds	6 reps: 7-10 7 reps: 6-8 8 reps: 5-7 9 reps: 5-6 10 reps: 4-6 11 reps: 4-5 12 reps: 4-5 13 reps: 4 14 reps: 3-4 15 reps: 3-4

for a sample TUT strength training program that frequently cycles reps and TUT. Choose a workout program from the training split section in chapter 8 and change the number of reps, rep speed, and TUT weekly as prescribed in the table. The best way to use the TUT method is to train with a stopwatch to monitor the TUT for each set.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	**1**	2	3	4	5
Results	1	2	**3**	4	5

Table 9.3 Muscle Countdown

Week	Reps per set	Speed per rep (seconds)	TUT for set (seconds)
1	5	4	20
2	3	4	12
3	8	2	16
4	6	3	18
5	2	10	20
6	4	5	20
7	5	3	18
8	2	4	8

Diminishing-Set Method

The goal of the diminishing-set method is to complete 70 reps of an exercise in four sets. To start, you choose a weight at which you can perform about 20 reps of the exercise of choice. The first time you go through this, it will probably take you about six to eight sets, with two-minute rest periods between sets, to complete 70 repetitions. Your goal is to eventually get the 70 total repetitions done in four sets or fewer. The benefit of this method is that it encourages strength changes and muscle growth by altering the biochemical pathways in the muscle fibers. Over time, the muscles are able to perform more reps per set because they are better at generating energy for muscle contractions. In addition, they are able to recover more fully between sets because of more efficient biochemical pathways. This method is great for developing endurance strength and therefore is best to use during periods in your strength training cycle when reps are on the high end. See table 9.4 for a sample diminishing-set workout for the bench press. A great way to use this method is to do this for two exercises per muscle group using this method for both exercises. For example, follow up the bench press workout with a diminishing-set protocol for one other chest exercise, such as the incline dumbbell bench press.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	**3**	4	5

Table 9.4 Diminish for Strength

Set	Weight (pounds)	Reps	Rest
WEEK 1			
1	275	20*	2 min
2	275	16*	2 min
3	275	12*	2 min
4	275	9*	2 min
5	275	6*	2 min
6	275	5*	2 min
7	275	2**	2 min
WEEK 2			
1	275	22*	2 min
2	275	17*	2 min
3	275	13*	2 min
4	275	10*	2 min
5	275	7*	2 min
6	275	3**	2 min
WEEK 3			
1	275	23*	2 min
2	275	18*	2 min
3	275	14*	2 min
4	275	10*	2 min
5	275	5**	2 min
WEEK 4			
1	275	24*	2 min
2	275	19*	2 min
3	275	15*	2 min
4	275	10*	2 min
5	275	2**	2 min
WEEK 5			
1	275	24*	2 min
2	275	20*	2 min
3	275	16*	2 min
4	275	10*	2 min

*To failure.
**Stop at repetition 70.

PROGRAMS THAT MANIPULATE REPETITIONS

Maximal strength is all about the single repetition. How strong a person is usually is measured by the amount of weight he or she can lift for one rep. However, it's rare to train for strength by doing single reps. Instead, a variety of rep ranges are used to benefit the one-rep max. This section covers strength training programs that manipulate the repetitions that are performed during each set. This includes programs that alter the number of reps performed per set (such as the 6 by 6 by 6 system, 5 by 10 training, 16-week drop, 5–3–2 method, and higher-strength program) as well as programs that manipulate the way each repetition is performed (such as static strength training, stronger by the inch program, ballistic training, and negative-rep training).

6 by 6 by 6 System

Similar to the other numeral-driven programs, this one involves simply picking a weight that will allow you to perform six sets of six repetitions on an exercise. The ideal weight will take you to failure only on the last set. Because of the higher volume and intensity involved, muscle groups should not be trained more than twice per week. The benefit of using this rep range is that it builds both a good deal of strength and muscle mass. The goal is to increase the weight used on each exercise by the end of the six-week program. Increase the weight when you can do more than six reps on the sixth set. See table 9.5 for a sample six-week 6 by 6 by 6 workout program that follows an upper- and lower-body training split.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	**3**	4	5

Table 9.5 6 by 6 by 6 Strength

MONDAY: UPPER-BODY WORKOUT 1 (BENCH PRESS AND PUSHING EXERCISES)		
Exercise	**Sets**	**Reps**
Bench press	6	6
Dumbbell bench press	6	6
Barbell shoulder press	6	6
Upright row	6	6
Close-grip bench press	6	6
Dip	6	6
Standing crunch	6	8-10
TUESDAY: LOWER-BODY WORKOUT 1 (SQUAT AND QUADRICEPS EXERCISES)		
Squat	6	6
Leg press	6	6
Leg extension	6	6
Standing calf raise	6	8-10

THURSDAY: UPPER-BODY WORKOUT 2 (BENCH PRESS AND PULLING EXERCISES)		
Exercise	**Sets**	**Reps**
Bench press	6	6
Lat pulldown	6	6
Barbell row	6	6
Barbell curl	6	6
Russian twist	6	20
FRIDAY: LOWER-BODY WORKOUT 2 (DEADLIFT AND HAMSTRING EXERCISES)		
Deadlift	6	6
Romanian deadlift	6	6
Lying leg curl	6	6
Good morning	6	6
Seated calf raise	6	10-12

5 by 10 Training

The 5 by 10 training program uses two distinct rep ranges to maximize both strength and muscle-mass gains. The 5 portion of the program comes from the 5 by 5 training method, or five sets of five reps with two-minute rest periods between sets. It is a method for developing strength that dates to the 1950s. The goal of the 5 by 5 workout is to do five sets of five reps with a given weight. On your first workout you should pick a heavy weight that allows you to get only five reps on the first set and possibly five on your second. This should be about 85 percent RM for most exercises. If you can get five reps on the third set, the weight you chose was too light; you'll need to add 5 to 10 pounds depending on the exercise. If, on the other hand, you can't get at least 14 total reps over the five sets, the weight you chose was too heavy; you'll need to drop about 5 to 10 pounds. When you find the right weight for the exercise, stay with that weight over the course of this workout until you can do all five sets for five reps. Then you'll start over and increase the weight again to one that allows you to get only five reps on the first set. Do this on two exercises for each muscle group (for example, bench press and incline dumbbell bench press, squat and leg press, and deadlift and Romanian deadlift). For all other exercises that follow in that workout, do three sets of five to seven reps (except for calf and ab exercises, which can be done at higher reps).

The 10 portion of the 5 by 10 program comes from the 10 by 10 program used in this workout scheme. The goal is to perform 10 sets of 10 reps with a given weight. The reason this is included in a strength program is to stimulate the muscle fibers with a different stimulus in each workout. The schemes of the 5 by 5 and the 10 by 10 are similar, but different weights, reps, and total sets are used for each. This cycling of weight, reps, and sets prevents the muscle fibers from stagnating in the program, and therefore it enhances muscle adaptation.

For the 10 by 10 training, do 10 sets of 10 reps with just one exercise per workout and follow it with three sets of 8 to 10 reps on all the subsequent assistance exercises for that workout (except for calf and ab exercises, which can be done at higher reps). For the 10 by 10 training, choose a weight that you can normally get for about 12 to 15 reps. This should be about 65 to 70 percent RM for most

exercises. The first few sets will feel very light. This will serve as a thorough warm-up. Perform these early sets with explosive power on each rep to recruit more of the fast-twitch muscle fibers that are capable of greater gains in strength and power. As the sets continue, the fatigue will start to set in and the number of reps will fall drastically. As with the 5 by 5 program, once you can complete 10 sets of 10 reps, you increase the weight again and start over.

Because you will reach failure several times on each workout, you should train each muscle group only once per week, such as with the squat–bench press–deadlift training split. This split is used in the sample 5 by 10 program outline in table 9.6. Simply follow this split and alternate the weight, reps, and sets every other week. You'll likely reach the 5 by 5 goal first. Increase the weight again and continue progressing until you reach the 10 by 10 goal or eight weeks have passed. Then switch over to a more basic training scheme.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 9.6 5 by 10 Strength

5 × 5 WEEKS		
WORKOUT 1: SQUAT DAY (MONDAY)		
Exercise	**Sets**	**Reps**
Squat	5	5
Leg press	5	5
Leg extension	3	5-7
Standing calf raise	3	8-10
Russian twist	3	10-15
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	5	5
Dumbbell bench press	5	5
Barbell shoulder press	3	5-7
Close-grip bench press	3	5-7
Cable crunch	3	10-12
WORKOUT 3: DEADLIFT DAY (FRIDAY)		
Deadlift	5	5
Romanian deadlift	5	5
Lying leg curl	3	5-7
Barbell row	3	5-7
Barbell curl	3	5-7
Hanging leg raise	3	12-15

10 × 10 WEEKS		
WORKOUT 1: SQUAT DAY (MONDAY)		
Exercise	**Sets**	**Reps**
Squat	10	10
Leg press	3	8-10
Lunge	3	8-10
Seated calf raise	3	12-15
Cable woodchopper	3	15-20
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	10	10
Dumbbell bench press	3	8-10
Dumbbell shoulder press	3	8-10
Triceps dip	3	8-10
Reverse crunch	3	10-12
WORKOUT 3: DEADLIFT DAY (FRIDAY)		
Deadlift	10	10
Romanian deadlift	3	8-10
Seated leg curl	3	8-10
Pulldown	3	8-10
Dumbbell curl	3	8-10
Weighted crunch	3	8-10

16-Week Drop

This program is a stepwise progression from lighter weight and higher reps to heavy weight and low reps over a 16-week period. The 16-week drop is a great program for beginner and intermediate weightlifters who are interested in peaking maximal strength. Because it starts with lighter weight and higher reps and slowly increases the weight while decreasing the reps over the 16 weeks, it allows the beginner enough time to work with higher reps and lower intensities before jumping into the heavy-weight and low-rep training that is required to boost maximal strength. It works well with any training split, including a whole-body strength training split. This program starts with sets of 12 reps with a weight that is about 70 percent RM for three weeks. Then the reps drop to 10 per set with a weight increase to about 75 percent RM for the next three weeks. Next the weight bumps up to 80 percent RM and the reps drop to 8 per set for the next three weeks. Following that, the weight increases again to 85 percent RM and reps drop to five per set for the next three weeks. This is followed by a bump in weight to 90 percent RM and a corresponding drop in reps to four per set for three more weeks. And finally, the last week is associated with an increase in weight to 95 percent RM as reps drop down to two per set. One-rep max testing on all three exercises can be done after this final week of training. See table 9.7 for a sample 16-week drop program.

Rating

Time	1	2	**3**	4	5
Length	1	2	3	4	**5**
Difficulty	**1**	2	3	4	5
Results	1	2	3	**4**	5

Table 9.7 Sweet 16

WEEKS 1-3

WORKOUT 1: MONDAY (SQUAT FOCUS)

Exercise	Weight (% RM)	Sets	Reps
Squat	70%	5	12
Leg press	70%	3	12
Incline bench press	70%	3	12
Dumbbell shoulder press	70%	3	12
Barbell row	70%	3	12
Stiff-leg deadlift	70%	3	12
Close-grip bench press	70%	3	12
Dumbbell curls	70%	3	12
Hanging leg raise		3	12-15

WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)

Exercise	Weight (% RM)	Sets	Reps
Bench press	70%	5	12
Dumbbell bench press	70%	3	12
Barbell hack squat	70%	3	12
Barbell shoulder press	70%	3	12
Deadlift	70%	3	12
Dumbbell row	70%	3	12
Triceps dip	70%	3	12
Barbell curl	70%	3	12
Cable woodchopper		3	20

WEEKS 1-3 *(continued)*

WORKOUT 3: FRIDAY (DEADLIFT FOCUS)

Exercise	Weight (% RM)	Sets	Reps
Deadlift	70%	5	12
One-arm dumbbell deadlift	70%	3	12
Bench press	70%	3	12
Upright row	70%	3	12
Lat pulldown	70%	3	12
Lying triceps extension	70%	3	12
Preacher curl	70%	3	12
Back extension		3	15-20

WEEKS 4-6

WORKOUT 1: MONDAY (SQUAT FOCUS)

Exercise	Weight (% RM)	Sets	Reps
Squat	75%	5	10
Leg press	75%	3	10
Incline dumbbell press	75%	3	10
Dumbbell shoulder press	75%	3	10
T-bar row	75%	3	10
Romanian deadlift	75%	3	10
Close-grip bench press	75%	3	10
Dumbbell curl	75%	3	10
Reverse crunch		3	12-15

(continued)

Sweet 16 *(continued)*

WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)			
Exercise	Weight (% RM)	Sets	Reps
Bench press	75%	5	10
Incline bench press	75%	3	10
Lunge	75%	3	10
Barbell shoulder press	75%	3	10
Deadlift	75%	3	10
Dumbbell row	75%	3	10
Triceps dip	75%	3	10
Barbell curl	75%	3	10
Dumbbell woodchopper		3	15
WORKOUT 3: FRIDAY (DEADLIFT FOCUS)			
Deadlift	75%	5	10
Good morning	75%	3	10
Bench press	75%	3	10
Upright row	75%	3	10
Lat pulldown	75%	3	10
Triceps pressdown	75%	3	10
Preacher curl	75%	3	10
Back extension		3	15

WEEKS 7-9

WORKOUT 1: MONDAY (SQUAT FOCUS)			
Squat	80%	5	8
Leg press	80%	3	8
Incline bench press	80%	3	8
Dumbbell shoulder press	80%	3	8
Barbell row	80%	3	8
Stiff-leg deadlift	80%	3	8
Close-grip bench press	80%	3	8
Dumbbell curls	80%	3	8
Hanging leg raise		3	12-15
WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)			
Bench press	80%	5	8
Dumbbell bench press	80%	3	8
Barbell hack squat	80%	3	8
Barbell shoulder press	80%	3	8
Deadlift	80%	3	8
Dumbbell row	80%	3	8
Triceps dip	80%	3	8
Barbell curl	80%	3	8
Cable woodchopper		3	12
WORKOUT 3: FRIDAY (DEADLIFT FOCUS)			
Deadlift	80%	5	8
One-arm dumbbell deadlift	80%	3	8
Bench press	80%	3	8
Upright row	80%	3	8
Lat pulldown	80%	3	8
Lying triceps extension	80%	3	8
Preacher curl	80%	3	8
Back extension		3	12-15

WEEKS 10-12

WORKOUT 1: MONDAY (SQUAT FOCUS)			
Squat	85%	5	5
Leg press	85%	3	5
Incline dumbbell press	85%	3	5
Dumbbell shoulder press	85%	3	5
T-bar row	85%	3	5
Romanian deadlift	85%	3	5
Close-grip bench press	85%	3	5
Dumbbell curl	85%	3	5
Reverse crunch		3	12-15
WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)			
Bench press	85%	5	5
Incline bench press	85%	3	5
Lunge	85%	3	5
Barbell shoulder press	85%	3	5
Deadlift	85%	3	5
Dumbbell row	85%	3	5
Triceps dip	85%	3	5
Barbell curl	85%	3	5
Dumbbell woodchopper		3	15
WORKOUT 3: FRIDAY (DEADLIFT FOCUS)			
Deadlift	85%	5	5
Good morning	85%	3	5
Bench press	85%	3	5
Upright row	85%	3	5
Lat pulldown	85%	3	5
Triceps pressdown	85%	3	5
Preacher curl	85%	3	5
Back extension		3	15

WEEKS 13-15

WORKOUT 1: MONDAY (SQUAT FOCUS)

Exercise	Weight (% RM)	Sets	Reps
Squat	90%	5	4
Leg press	90%	3	4
Incline bench press	90%	3	4
Dumbbell shoulder press	90%	3	4
Barbell row	90%	3	4
Stiff-leg deadlift	90%	3	4
Close-grip bench press	90%	3	4
Dumbbell curl	90%	3	4
Hanging leg raise		3	10

WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)

Bench press	90%	5	4
Dumbbell bench press	90%	3	4
Barbell hack squat	90%	3	4
Barbell shoulder press	90%	3	4
Deadlift	90%	3	4
Dumbbell row	90%	3	4
Triceps dip	90%	3	4
Barbell curl	90%	3	4
Cable woodchopper		3	10

WORKOUT 3: FRIDAY (DEADLIFT FOCUS)

Deadlift	90%	5	4
One-arm dumbbell deadlift	90%	3	4
Bench press	90%	3	4
Upright row	90%	3	4
Lat pulldown	90%	3	4
Lying triceps extension	90%	3	4
Preacher curl	90%	3	4
Back extension		3	10

WEEK 16

WORKOUT 1: MONDAY (SQUAT FOCUS)

Exercise	Weight (% RM)	Sets	Reps
Squat	95%	5	2
Leg press	95%	3	2
Incline dumbbell press	95%	3	2
Dumbbell shoulder press	95%	3	2
T-bar row	95%	3	2
Romanian deadlift	95%	3	2
Close-grip bench press	95%	3	2
Dumbbell curl	95%	3	2
Reverse crunch		3	12-15

WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)

Bench press	95%	5	2
Incline bench press	95%	3	2
Lunge	95%	3	2
Barbell shoulder press	95%	3	2
Deadlift	95%	3	2
Dumbbell row	95%	3	2
Triceps dip	95%	3	2
Barbell curl	95%	3	2
Dumbbell woodchopper		3	10

WORKOUT 3: FRIDAY (DEADLIFT FOCUS)

Deadlift	95%	5	2
Good morning	95%	3	2
Bench press	95%	3	2
Upright row	95%	3	2
Lat pulldown	95%	3	2
Triceps pressdown	95%	3	2
Preacher curl	95%	3	2
Back extension		3	10

5–3–2 Method

This 10-week maximal-strength peaking program is best used by those with at least one year of solid training experience. It starts off heavy and gets even heavier throughout the program. It is a simple program to follow because the rep ranges correspond with the number of weeks you should train with that rep range. The first five weeks is a 5 by 5 program where you stick with a weight that allows you to get five sets of five reps. Then for the next three weeks you bump it up to a weight that allows you to get three sets of three reps, or a 3 by 3 program. You finish with two weeks of training with a weight that allows you to get only two sets of two reps, or a 2 by 2 program.

Similar to other weight progression schemes for increasing strength, this program works because it slowly increases the weight until a weight close to the one-rep max is being used. See table 9.8 for a sample 10-week 5–3–2 program that will boost strength on all three major lifts. This sample program uses a push–pull training split.

Rating

Time	1	**2**	3	4	5
Length	1	2	3	**4**	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	4	**5**

Table 9.8 5–3–2 Strength Program

WEEKS 1-5

WORKOUT 1: MONDAY AND THURSDAY (PUSH)

Exercise	Weight (% RM)	Sets	Reps
Squat*	85%	5	5
Leg press	85%	5	5
Leg extension	85%	5	5
Bench press*	85%	5	5
Incline dumbbell press	85%	5	5
Dumbbell shoulder press	85%	5	5
Close-grip bench press	85%	5	5
Standing calf raise**		5	10-12

WORKOUT 2: TUESDAY AND FRIDAY (PULL)

Deadlift	85%	5	5
Lying leg curl	85%	5	5
Barbell row	85%	5	5
Lat pulldown	85%	5	5
Barbell curl	85%	5	5
Weighted crunch***		5	10-12

WEEKS 6-8

WORKOUT 1: MONDAY AND THURSDAY (PUSH)

Squat*	90%	3	3
Leg press	90%	3	3
Split squat	90%	3	3
Bench press*	90%	3	3
Incline bench press	90%	3	3
Barbell shoulder press	90%	3	3
Dips	90%	3	3
Standing calf raise**		4	8-10

WEEKS 6-8 *(continued)*

WORKOUT 2: TUESDAY AND FRIDAY (PULL)

Exercise	Weight (% RM)	Sets	Reps
Deadlift	90%	3	3
Good morning	90%	3	3
Seated cable row	90%	3	3
Lat pulldown	90%	3	3
Barbell curl	90%	3	3
Standing crunch****		4	8-10

WEEKS 9-10

WORKOUT 1: MONDAY AND THURSDAY (PUSH)

Squat*	95%	2	2
Front squat	95%	2	2
Leg press	95%	2	2
Bench press*	95%	2	2
Dumbbell bench press	95%	2	2
Barbell shoulder press	95%	2	2
Close-grip bench press	95%	2	2
Standing calf raise**		3	6-8

WORKOUT 2: TUESDAY AND FRIDAY (PULL)

Deadlift	95%	2	2
Romanian deadlift	95%	2	2
Barbell row	95%	2	2
Lat pulldown	95%	2	2
Barbell curl	95%	2	2
Standing crunch*****		3	6-8

*Thursday perform bench press and incline dumbbell press before squat.
**Thursday perform seated calf raise.
***Friday perform hanging leg raise.
****Friday perform Russian twist.
*****Friday perform dumbbell woodchopper.

Higher-Strength Program

This program is based on research from Japan that has discovered when one set of very high reps is added to the last set of each exercise, strength gains are better than when training with just low reps. They studied leg strength in subjects on a 10-week program of leg presses and leg extensions. One group trained with five sets of three to five reps while the second group added one set of 25 to 30 reps at the end of each exercise. The group that added the 25 to 30 reps had a 5 percent greater increase in strength, as well as greater increases in muscle size, than the group performing just five sets of 3 to 5 reps. Although the scientists were unsure of the exact mechanism for the additional strength gains, it appears that the single set of higher reps provides an additional training stimulus that affects strength gains. The higher levels of growth hormone associated with the higher-rep training may have affected adaptations in muscle fiber that could have increased strength of muscle fibers. Taking advantage of this information is as simple as adding one set of 25 to 30 reps with a weight that is only about 45 to 50 percent RM to a program that incorporates a 5 by 5 strength training system. Be sure to take this final set to muscle failure. Since this program is fairly demanding on the muscle fibers, you should train each muscle group just once per week while using this program. Follow it for no more than eight weeks.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	3	**4**	5

Table 9.9 Get High for Strength

Exercise	Sets	Reps	Weight (% RM)
WORKOUT 1: SQUAT DAY (MONDAY)			
Squat	5	5	85%
	1	25-30	45-50%
Leg press	5	5	85%
	1	25-30	45-50%
Leg extension	5	5	85%
	1	25-30	45-50%
Standing calf raise	5	25-30	
Cable woodchopper	5	25-30	
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)			
Bench press	5	5	85%
	1	25-30	45-50%
Incline bench press	5	5	85%
	1	25-30	45-50%
Barbell shoulder press	5	5	85%
	1	25-30	45-50%
Close-grip bench press	5	5	85%
	1	25-30	45-50%
Standing crunch	5	8-10	
WORKOUT 3: DEADLIFT DAY (FRIDAY)			
Deadlift	5	5	85%
	1	25-30	45-50%
Romanian deadlift	5	5	85%
	1	25-30	45-50%
Lying leg curl	5	5	85%
	1	25-30	45-50%
Barbell row	5	5	85%
	1	25-30	45-50%
Barbell curl	5	5	85%
	1	25-30	45-50%
Incline reverse crunch	5	15-20	

Static Strength Training

This method involves holding a heavy weight at the end of the positive phase of a rep for up to 20 seconds. Although using a full range of motion (ROM) is typically a smart thing to do, there are occasions when going against the norm is warranted, such as when strength gains have come to a halt regardless of the programs you have tried. When this is the case, it's time to pull out all the stops and use something quite unorthodox—such as static strength training. The term static means lack of movement, as in an isometric contraction. And as this term implies, with static training you take a weight and hold it in a fixed position for several seconds. This concept is based on the idea that by forcing the muscle to work only when it is maximally contracted and using the heaviest weight possible, you can optimize its strength potential.

Although there is no published research to support its effectiveness, anecdotal reports on static strength training are quite impressive. In fact, Bob Hoffman, founder of the York Barbell Company and former U.S. Olympic weightlifting coach, had members of the U.S. team use a similar training system with much success in the early 1960s. The late Mike Mentzer, professional bodybuilder, also touted the effectiveness of static contractions for building both muscle size and strength. It appears to work because of the overload that is placed on the muscle. When you train using a full ROM, the amount of weight you can use is limited by your sticking point—the point in the exercise ROM where you're weakest. You can use only as much weight as you can lift through that sticking point. With static contractions, the sticking point is eliminated, so you can overload the muscle fibers with as much weight as you can hold for at least 10 seconds in the strongest position of the particular muscle.

To use static strength training properly, be sure to start each workout with a thorough warm-up. Do two light sets of each exercise you're training statically. On each rep, stop and hold for a count of three at about two to four inches from the end of the full contraction. Hit a third warm-up set with a weight you can do for about six reps, but do only one rep—being sure to hold it for a count of three before ending the set. Do two static sets per exercise with two minutes of rest in between sets. The weight you choose should be light enough to allow you to hold it statically at about two to four inches from the full contraction point of the movement for at least 10 seconds but heavy enough so that you can't hold it for more than 20 seconds. See the following sample photos of static contraction hold positions for common exercises. Once you can hold a weight for more than 20 seconds, it's time to increase the weight. After the second set, drop the weight and do three full-ROM sets of that exercise.

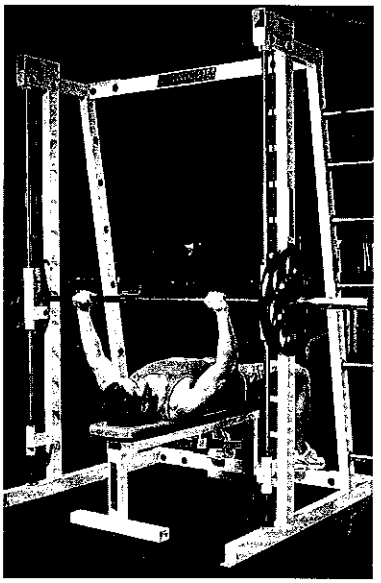
You'll need a reliable training partner to help you with this training method. Your training partner will need to help you move the weight to the static position but should apply only enough force as needed to help you get the weight there. That will help to prepare your muscles to resist the weight during the static contraction. The training partner should also watch the clock during your static sets to make sure you are within the time window of 10 to 20 seconds per set.

Try the static strength training program outlined in table 9.10 for eight weeks before returning to full-ROM training. The goal is to progress to heavier weights for the static contraction sets over the eight weeks. This should carry over to greater strength when you return to full-ROM training. This sample static strength training workout uses an upper- and lower-body powerlifting split.

Rating

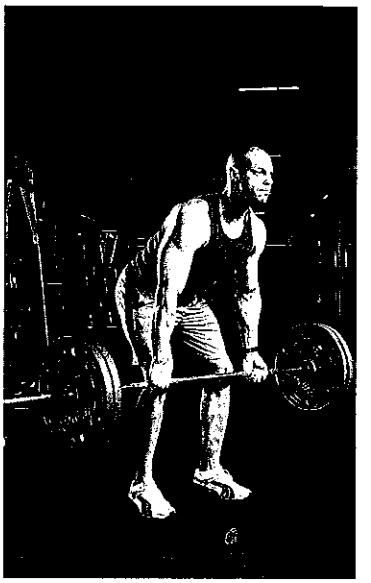
Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	**3**	4	5

Static Contraction Hold Positions



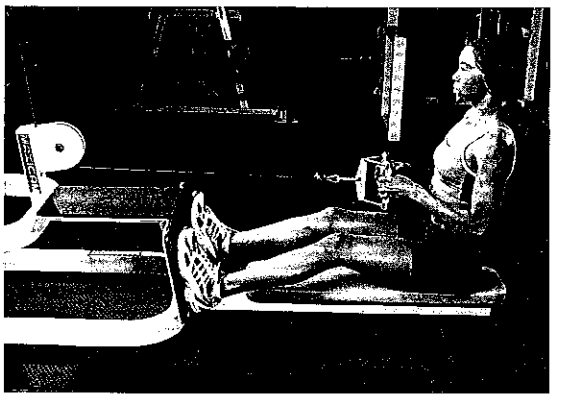
Static bench press.

Static squat.

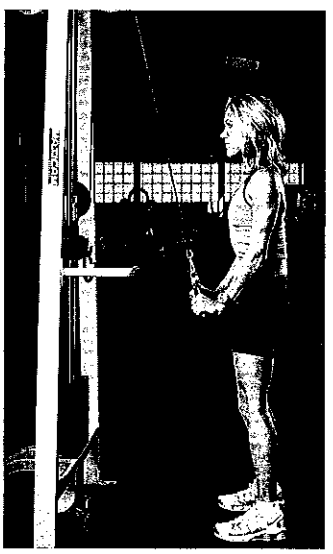


Static deadlift.

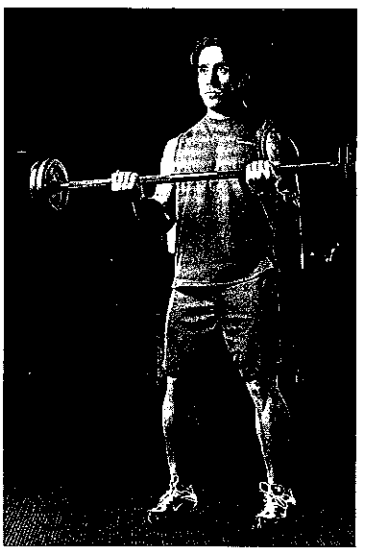
Static shoulder press.



Static seated row.



Static triceps pressdown.



Static barbell curl.

Static standing calf raise.

Table 9.10 Static King Workout

Exercise	Sets	Reps
UPPER-BODY WORKOUT 1: MONDAY (BENCH PRESS AND PUSHING EXERCISES)		
Bench press	2 static sets/10-20 sec	
	3	6 with 80%
Dumbbell bench press	2 static sets/10-20 sec	
	3	6 with 80%
Barbell shoulder press	2 static sets/10-20 sec	
	3	6 with 80%
Dumbbell lateral raise	2 static sets/10-20 sec	
	3	6 with 80%
Close-grip bench press	2 static sets/10-20 sec	
	3	6 with 80%
Triceps pressdown	2 static sets/10-20 sec	
	3	6 with 80%
Standing crunch	3	8-10
LOWER-BODY WORKOUT 1: TUESDAY (SQUAT AND QUADRICEPS EXERCISES)		
Squat	2 static sets/10-20 sec	
	3	6 with 80%
Leg press	2 static sets/10-20 sec	
	3	6 with 80%
Leg extension	2 static sets/10-20 sec	
	3	6 with 80%
Standing calf raise	2 static sets/10-20 sec	
	3	10-12
UPPER-BODY WORKOUT 2: THURSDAY (BENCH PRESS AND PULLING EXERCISES)		
Bench press	5	75%*
	2 static sets/10-20 sec	
Seated cable row	3	6 with 80%
Lat pulldown	2 static sets/10-20 sec	
	3	6 with 80%
Barbell curl	2 static sets/10-20 sec	
	3	6 with 80%
Russian twist	3	15-20
LOWER-BODY WORKOUT 2: FRIDAY (DEADLIFT AND HAMSTRING EXERCISES)		
Deadlift	2 static sets/10-20 sec	
	3	6 with 80%
Romanian deadlift	2 static sets/10-20 sec	
	3	6 with 80%
Lying leg curl	2 static sets/10-20 sec	
	3	6 with 80%
Seated calf raise	2 static sets/10-20 sec	
	3	12-15
Back extension	3	10-12

*Light bench press day—no static contractions.

Stronger by the Inch Program

This strength training program takes advantage of overload by starting with a weight that is greater than the lifter's 1RM. This weight is performed for partial-ROM reps that gradually increase in ROM until the full ROM is completed. It is a method to use sparingly, such as when all other strength training methods have failed to provide sufficient gains in strength. This method of using progressive partial reps to grow stronger works best for compound movements such as the three major strength lifts: bench press, squat, and deadlift.

To follow the stronger by the inch program safely and effectively, you should perform the lifts in a power rack. This allows you to accurately measure the ROM and keep it limited to where you want it. The pins will also act as a safety net for when you fail. See the sidebar on page 174 for setting up properly in the rack.

You start the program with about 10 percent more weight than your current one-rep max (1RM) for the lift on which you wish to increase your strength. For example, if your max bench press is 250 pounds, you should use about 275 for the stronger by the inch program. The program works best if you concentrate on using it for one lift at a time and train each major lift just once per week. The first week, start by doing a four-inch partial rep: Lower the bar only four inches (10 centimeters) from the top position of the exercise, near lockout. Each week you'll attempt to lower the ROM by lowering the pins in the rack by two inches (five centimeters). If you get stuck at a setting and can't get one rep, increase the pin height by two inches and complete the workout from there. Next week, lower the pin by two inches and try again. If you don't stick it at this point, strip off some plates to find a weight at which you can complete the partial rep. This is the new weight with which you'll finish the program. The goal is to lower the weight an additional two inches each week until you're about four inches above the bottom position. If you don't progress to this point by eight weeks, stop where you are and test your 1RM. You should still show some improvement on your strength in the full ROM for that lift.

This method of progressive partials works because of overload. By using a weight that's heavier than you could normally handle for full-range reps, you overload the majority of the muscle fibers that perform the full-ROM version of the exercise. Although your strength increase will be mainly in the small ROM you're using, some of this will carry over into the lower portions of the ROM. By slowly lowering the ROM in two-inch increments, you allow the muscle fibers to adapt to the heavier weight and slowly increase the ROM to which your new strength can be applied.

Table 9.11 shows a sample bench press program set up for a lifter with an 18-inch range of motion and a 275-pound 1RM using 300 as his or her new weight. Table 9.12 shows a sample program for incorporating partial rep training on the bench press into a workout program.

Rating

Time	1	2	3	**4**	5
Length	1	2	**3**	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	**3**	4	5

Table 9.11 Inching Along on the Bench Press

Week	Pin setting
1	4 inches from top
2	6 inches from top
3	8 inches from top
4	10 inches from top (if you can't make without assistance, do it again)
5	10 inches from top
6	12 inches from top
7	14 inches from top
8*	Full-ROM 1RM with 300 pounds

*Always retest your 1RM on week 8, regardless of how far you've progressed down the rack. You may be able to do the weight for a full-ROM rep, even if you haven't gotten below 10 or 12 inches from the top. Even if you can't do a full ROM with the new weight, you should be able to do at least 5% more than your original 1RM.
Note: 1 inch = 2.54 centimeters

Table 9.12 Full-Rep Program

Exercise	Set	ROM	Weight (% 1RM)	Reps
Bench press	Warm-up	Full	50%	10
	Warm-up	Full	70%	6
	Warm-up	Partial	90%	2
	Warm-up	Partial	100%	1
	1	Partial	110%	1-3
	2	Partial	110%	1-3
	3	Full	90%	2-3
	4	Full	85%	5-6
	5	Full	75%	10
Dumbbell bench press	1	Full	80%	6-8
	2	Full	80%	6-8
	3	Full	80%	6-8
Barbell shoulder press	1	Full	80%	6-8
	2	Full	80%	6-8
	3	Full	80%	6-8
Close-grip bench press	1	Full	80%	6-8
	2	Full	80%	6-8
	3	Full	80%	6-8
Hanging leg raise	4 sets	Full	Body weight	12-15

Rack It Up

Follow these steps to get set up in the power rack for progressive partials.

- Measure the distance between safety pin settings (holes) on the rack. Most racks will have holes spaced every two to four inches (five to ten centimeters).
- Determine the top position in your ROM, just before lockout. Use the pinhole just below this to designate your top point.
- Determine the bottom position of your ROM and designate it with the lower pinhole.
- Count the number of pin settings between the top and bottom positions. The distance will probably range between 12 and 24 inches (30.5 to 61 centimeters), depending on your limb length and the exercise you're doing. Therefore, the number of pin settings will likely range between 2 and 10 holes. Your progression scheme will be based partly on this number.
- Subtract four inches from the top, meaning you won't use the first one or two pin settings.
- Subtract four inches from the bottom, meaning you won't work below four inches from the bottom position. (Once you're close to this point, you'll likely be able to perform a full rep with the weight.) In other words, you won't work down to the last one or two pegs.
- Now count the number of pin settings between these two settings. This should be somewhere between one and seven holes.
- If the rack you're using has setting increments larger than two inches, you'll need to modify it so that you make two-inch progressions over the course of the program. You can use bar pads, towels, or 2.5-pound plates (most have about a two-inch radius).

Ballistic Strength Training

This training method develops explosive power, which can increase strength. This is because each strength exercise has a natural biomechanical sticking point that occurs at a spot in the range of motion where primary muscle groups are changing. For example, in the bench press, the sticking point for many lifters is where the primary force is being changed from the pectoralis major to the deltoids and triceps. Ballistic training uses explosive movements that power you through these sticking points.

The major benefit of ballistic training has to do with acceleration. In a traditional rep, you typically accelerate the weight on the concentric portion only during the first third of the range of motion. During the other two-thirds, the weight is actually being decelerated. If deceleration did not take place, you wouldn't be able to hold onto the weight at the end of the rep. Yet, when you train ballistically, the weight is accelerated through the whole range of motion and starts to decelerate only after you've let go of the bar. This allows you to develop much more power through the rep.

Ballistic training also forces your body to trigger fast-twitch muscle fibers. This is important because these fibers have the greatest potential for strength gains. Because ballistic training forces the muscles to adapt to contracting very quickly and forcefully, it trains the fast-twitch fibers to produce a great amount of force in a very short period. This is very useful when applying a great amount of force such as during a max bench press, squat, or deadlift.

Ballistic training is most commonly performed with bench press throws and squat jumps, often using a Smith machine, which guides the bar securely along metal rods. Yet, ballistic training is not confined to these exercises. In fact, ballistic training can be done for almost any muscle group. See table 9.13 for a list of ballistic exercises that can be performed in any gym.

Regardless of the exercise, ballistic training should be done with a weight that is about 30 to 50 percent of the 1RM for that exercise. This weight is used because research has shown that optimal power is produced at about 30 to 50 percent RM. For example, if your max bench press is 300 pounds, you would do bench press throws on the Smith machine with about 90 to 150 pounds. The number of reps performed with ballistic training is three to five reps, never any more. This is to keep every rep a max effort and prevent fatigue. Fatigue does not benefit the development of power and can actually increase the risk of injury when training ballistically. Therefore, rest time should be ample between sets. Take at least three minutes of rest before doing another set.

A great way to work ballistic training into your regimen is to use a max effort–dynamic effort training split and perform the ballistic training during the dynamic effort portion of the split. An example of this is outlined in table 9.14 to be done on the third and fourth workouts (usually on Thursday and Friday) of a max effort–dynamic effort training split. Another way to train ballistically is to follow a squat, bench press, and deadlift training split on a full-body ballistic workout performed on a fourth day. An example of such a workout is presented in table 9.15.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	**3**	4	5

Table 9.13 Ballistic Bounty

Muscle group	Exercise	Execution
Chest	Bench press throw	On the Smith machine, lower the bar to your chest just as you would during a normal set. Then, press the weight off your chest explosively so that you throw it up as high as possible. Keep your arms extended with a slight bend in the elbows and catch the weight as it comes back down. Reset your hands so they're even before doing the next rep.
Legs	Barbell squat jump	Hold a loaded barbell on your shoulders as you would for a set of regular squats. Slowly lower into a squat until your thighs are about parallel to the ground, then explode up as fast as you can so that your feet leave the floor at the top of the motion. Land with soft knees and go down into your next rep.
Legs and back	Dumbbell deadlift jump	Squat down to grab dumbbells that are placed just outside your feet. As with the squat jump, you will explode up as fast as you can so that your feet leave the ground at the top of the motion. Land with soft knees and immediately go down to return the weight to the floor.
Back	One-arm row pull	Place the bar at the very bottom of the Smith machine and stand sideways to it with your right foot 12 to 18 inches (30.5 to 46 centimeters) away to provide the bar with plenty of clearance when you release it. Grasp the bar with your right hand, bend your knees slightly, and keep your back flat. Using your back muscles, pull the weight up forcefully and let go of the bar as you pull your shoulder blade back. Let the weight fall to the start; it will be cushioned by the bumper springs. Repeat for 3 to 5 reps and then switch arms.
Shoulders	Overhead press throw	Get on your knees while holding the bar of the Smith machine at upper chest level. Push the weight up forcefully overhead, releasing your grip at the top of the movement and catching the weight when it comes back down.
Triceps	Close-grip bench throw	This movement will be the same as for the bench throw, except that you'll grasp the bar with a shoulder-width grip. After catching the bar on the way down, be sure to reset your hands so they're even and close together.
Biceps	Biceps curl throw	Because the Smith machine limits you to a fixed path, the range of motion here will be shorter than on a free-weight barbell curl. Start just below halfway (arms at about 45 degrees to the floor) with a shoulder-width grip. Explode the weight up so that it leaves your hands before you're able to squeeze the contraction, as you normally would when curling. Again, catch the bar on the way down and reset your grip.

Table 9.14 Going Ballistic

LOWER-BODY WORKOUT 2 (SQUAT, DEADLIFT)			
Exercise	Sets	Reps	% 1RM
Barbell squat jump	3	3-5	30-50%
Dumbbell deadlift jump	3	3-5	30-50%
Romanian deadlift	3	3-5	75%
Barbell good morning	3	3-5	75%
Russian twist	3	15-20	Body weight
UPPER-BODY WORKOUT 2 (BENCH PRESS)			
Bench press throw	3	3-5	30-50%
Overhead press throw	3	3-5	30-50%
Close-grip bench throw	3	3-5	30-50%
One-arm row pull	3	3-5	30-50%
Biceps curl throw	3	3-5	30-50%
Decline crunch	3	12	Body weight

Table 9.15 Power Play Day

Exercise	Sets	Reps	% 1RM
Barbell squat jump	3	3-5	30-50%
Bench press throw	3	3-5	30-50%
One-arm row pull	3	3-5	30-50%
Dumbbell deadlift jump	3	3-5	30-50%
Overhead press throw	3	3-5	30-50%
Close-grip bench throw	3	3-5	30-50%
Biceps curl throw	3-4	3-5	

Negative-Rep Strength Training

Negative-rep training refers to training that emphasizes the negative, or eccentric, portion of the exercise. Unlike negative-rep training to build muscle mass, negative-rep strength training does not come as an afterthought at the end of a workout but as the first and foremost method used in the workout. Doing negative reps as the first sets of an exercise allows for greater than 100 percent RM to be used as weight. Most lifters can resist about 130 percent of their 1RM on the negative portion of the rep. Training with this much weight even on the negative motion of an exercise can cause real strength gains on the positive portion of the exercise as well. This has to do with muscle fiber and nerve adaptations. The overload that the excess weight places on the muscle fiber induces muscle damage and influences the nerves that cause the muscles to recruit more fast-twitch muscle fibers. These two factors result in muscle regeneration that leads to larger and stronger muscle fibers as well as a greater number of fast-twitch muscle fibers.

When training with negative reps, the key is to perform the rep slowly. You should attempt a weight that is about 130 percent of your 1RM for the exercises you are training and resist it at a rate that takes three to five seconds to complete the negative rep. If you can resist the weight for longer than five seconds, add more weight. If you can't resist the weight for at least three seconds, reduce the weight. Perform three sets of four to six negative reps for each major lift—bench press, squats (should be done on Smith machine), and deadlift. Follow the negatives with two sets of regular reps using a weight that is about 75 to 80 percent RM.

Because of the intensity of negative-rep training, you'll need more time to recover between sets, at least three minutes. The same holds true for recovery between workouts, because you should allow a full seven days of rest between workouts. That makes the squat–bench press–deadlift training split a popular one to use when training with negative-rep training. See table 9.16 for a sample negative-rep training week using that split. Follow this for no more than six weeks.

To use negative-rep training safely and effectively, you should have the help of a training partner. Those who train alone can do unilateral negatives with the help of a Smith machine. To do this, load the Smith machine with about 70 percent RM for the bench press, squat, or deadlift. Lift the weight through the positive, or concentric, portion of the lift, but resist the weight through the negative portion with only one limb. Switch the limb that takes the negative rep every other rep until each limb has performed four to six negative reps.

Finally, you should be aware of delayed-onset muscle soreness (DOMS) that usually accompanies negative-rep training. For those unaccustomed to negative-rep training, DOMS can be severe. The more often you use the technique, the less severe the soreness will be. Some people may be at risk for developing a rare condition known as rhabdomyolysis. This sometimes-fatal condition can occur after severe muscle damage. When muscles break down, they release potassium, enzymes, and myoglobin into the blood. Myoglobin can accumulate in the kidneys and cause them to collapse. This can escalate into dangerously high blood potassium levels and may result in heart failure. To prevent rhabdomyolysis while using negative-rep training, drink plenty of water (up to one gallon per day), limit alcohol consumption, avoid training with negatives for several weeks after a viral infection, and go to the hospital immediately if your urine turns dark brown.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	**3**	4	5

Table 9.16 Accentuate the Positive

Exercise	Sets	Reps	Weight (% RM)
WORKOUT 1: SQUAT DAY (MONDAY)			
Smith machine squat	3	4-6	130%
Barbell squat	2	6-8	80%
Leg press	3	6-8	80%
Leg extension	3	8-10	75%
Standing calf raise	3	8-10	75%
Crunch	3	20	
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)			
Bench press	3	4-6	130%
	2	6-8	80%
Incline dumbbell press	3	6-8	80%
Barbell shoulder press	3	6-8	80%
Close-grip bench press	3	6-8	80%
Hanging leg raise	3	12-15	
WORKOUT 3: DEADLIFT DAY (FRIDAY)			
Deadlift	3	4-6	130%
	2	6-8	80%
Good morning	3	6-8	80%
Lying leg curl	3	8-10	75%
Barbell row	4	6-8	80%
Barbell curl	4	6-8	80%
Russian twist	4	15-20	

PROGRAMS THAT MANIPULATE LOAD

Strength is all about weight. The amount of weight you can lift defines your level of strength. Because of this, it is only logical that strength training programs that vary the weight you lift are successful strategies for building muscle strength. This section discusses strength training techniques that alter the load, or amount of weight, used during workouts. Some techniques work through mechanisms involving the nervous system, such as the max-out for muscle strength method and wave training method. The 5 percent method works by systematically increasing and decreasing the weight over time, while the DeLorme ascending pyramid progressively increases the weight on each successive set. One program—the same-weight training method—uses the same weight for all sets. Modifying the weight you train with by following any of these programs will work to increase the total amount of weight you can lift.

Max-Out for Muscle Strength Method

This method takes advantage of a phenomenon known formally as postactivation potentiation, or simply potentiation. This refers to the ability of one exercise to immediately enhance the performance of a second exercise that is performed shortly after the first exercise. Although there are many ways to do this, the max-out for muscle strength method uses the same exercise but different weights to achieve the same effect. More precisely, this method uses a one-rep set with 90 percent RM to enhance the number of reps that can be performed with a subsequent set using 80 percent RM.

Although the exact mechanism for this phenomenon has not been pinpointed, scientists currently believe that it may be due to enhanced excitation of the central nervous system or to molecular events in the muscle fibers themselves. In simpler terms, performing the heavy set "tricks" your nervous system into preparing for another heavy set. When you suddenly drop the weight, it feels lighter than it normally would because your nervous system is calling in more muscle fibers to do the job than it normally would for the lighter weight. This is the reason baseball players swing with a weighted bat before hitting with a much lighter bat. Regardless of the mechanism, the bottom line is that it may increase your strength on lighter sets by close to 10 percent.

To perform this method in the gym, you do one set using 90 to 95 percent RM for just one rep. Then you rest three minutes and perform a set with about 10 percent more than 80 percent RM (a weight you can normally lift for about eight reps). The potentiation from the previous set should allow you to complete about eight reps with the heavier weight. For example, if your 1RM on the bench press is 300, the first set you do (after two or three warm-up sets) is for one rep with about 275 to 285 pounds. The second set you do would be with 260 pounds for about eight reps. Normally you would be able to lift only 240 pounds for eight reps, but the potentiation increased your strength by roughly 10 percent.

The best way to use this technique is to reserve it for major lifts and train those lifts just once per week. Do not use the max-out for muscle strength technique for more than eight weeks consecutively for any exercise. See table 9.17 for a sample squat workout using the max-out for muscle strength technique. This workout is for a lifter whose 1RM on the squat is 365 pounds, whose 90% RM is about 330 pounds, and whose 80% RM (what he or she can normally complete for eight reps) is about 290 pounds. This workout should be followed with the typical squat assistance exercises.

Rating

Time	1	2	**3**	4	5
Length	**1**	2	3	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	3	**4**	5

Table 9.17 Fast Strength

Exercise	Set	Weight (pounds)	Reps	Rest (minutes)
Squat	Warm-up	135	10	2
	Warm-up	225	7	2
	Warm-up	275	5	2
	Warm-up	315	1	3
	Set 1	330	1	3-5
	Set 2	310*	8	5
	Set 3	330	1	3-5
	Set 4	310*	8	3

*Although the lifter normally can squat only 290 pounds for eight reps, the potentiation allows for two sets of eight reps with 310 pounds.

5 Percent Method

This program follows a set pattern of progression in the amount of weight lifted. Basically, in each workout the weight lifted is increased by about 5 percent and the number of reps performed is decreased by one. Although the 5 percent program is a little more complicated than that, the result is simply an increase in strength of about 10 percent after only six successive workouts. The 5 percent program is best used on basic exercises such as the bench press, incline bench press, close-grip bench press, squat, deadlift, leg press, shoulder press, barbell row, and pulldown. It can also be adapted to basic arm exercises such as close-grip bench press, triceps pressdown, triceps extension, and the barbell curl. Perform no more than three exercises per muscle group and provide each with five to seven days of rest between workouts. To start the 5 percent program, pick a weight for each exercise that allows you to perform four sets of six reps with three- to four-minute rest periods between sets. We'll use the squat, with a weight of 300 pounds, as an example. In workout 1 you would perform four sets of the shoulder press, each for six reps using 300 pounds. For workout 2 you increase the weight by 5 percent—or to 315 pounds—and finish four sets of five reps. At workout 3 you increase the weight by 5 percent again (from the original 300 pounds)—or 330 pounds—and do four sets of four reps. Workout 4 has a slight change. Here you drop 5 percent of the weight from the previous workout—back to 315 pounds—but you do four sets of six reps. At workout 5 you bump up the weight again by 5 percent to 330 pounds and do four sets of five reps. In workout six you increase the weight again by 5 percent—or 345 pounds—and do four sets of four reps. During the next workout, you should be able to get four sets of six reps using 330 pounds—a nice 10 percent increase in strength.

See table 9.18 for a sample leg workout using the 5 percent method. Follow the leg press with other assistance exercises performed for three sets of four to six reps each.

The best way to use the 5 percent method is by training each muscle group only once per week to provide adequate recovery. The squat–bench press–deadlift training split fares well for this technique.

Rating

Time	1	2	**3**	4	5
Length	**1**	2	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	4	**5**

Table 9.18 5 Percent Squat Workout

Workout	Exercise	Weight (pounds)	Sets	Reps
1	Squat	300	4	6
	Leg press	700	4	6
2	Squat	315	4	5
	Leg press	735	4	5
3	Squat	330	4	4
	Leg press	770	4	4
4	Squat	315	4	6
	Leg press	735	4	6
5	Squat	330	4	5
	Leg press	770	4	5
6	Squat	345	4	4
	Leg press	805	4	4
7	Squat	330	4	6
	Leg press	770	4	6

Same-Weight Training Method

With this method the weight is maintained through all sets for that particular exercise. The key is starting with a weight at which you can get more repetitions than you will perform. For example, you should start with a weight at which you can get seven or eight reps on your exercise of choice (about 80 percent RM), but you'd perform only six reps. Rest only one to two minutes between sets. By the third to fifth set you will struggle to be able to complete six reps. You end the exercise once you fail to complete six reps. Your goal is to complete five sets of six reps. Once you are able to do more than five sets of six reps with a weight, increase the weight by 5 to 10 percent the next time and start the progression over. See table 9.19 for a sample same-weight training program for the bench press. In this example the lifter has a bench press 1RM of 315 pounds. This lifter's 80% RM for the bench press is 250 pounds. It takes the lifter seven weeks to finish two cycles of same-weight training. Each of these workouts can be followed with assistance exercises such as dumbbell bench press, barbell shoulder, press, and triceps dip.

Reserve same-weight training for just the major lifts and follow these lifts with assistance exercises for three sets of six to eight reps. Do two complete cycles for each exercise you are training with the same weight training method. That is, make it through one cycle of five sets of six reps and increase the weight. Then continue to that cycle until you can do five sets of six reps with the new weight. After that, switch back to a more basic training method. The same-weight training method works well with almost any training split, particularly the squat–bench press–deadlift training split.

Rating

Time	1	2	**3**	4	5
Length	1	2	3	**4**	5
Difficulty	1	**2**	3	4	5
Results	1	2	**3**	4	5

Table 9.19 Same-Weight Program

Weight	Set	Reps	Rest
	WORKOUT 1		
250	1	6	1 min
	2	6	1 min
	3	6	1 min
	4	4	
	WORKOUT 2		
250	1	6	1 min
	2	6	1 min
	3	6	1 min
	4	6	1 min
	5	4	
	WORKOUT 3		
250	1	6	1 min
	2	6	1 min
	3	6	1 min
	4	6	1 min
	5	6	
	WORKOUT 4		
265	1	6	1 min
	2	6	1 min
	3	5	
	WORKOUT 5		
265	1	6	1 min
	2	6	1 min
	3	6	1 min
	4	4	
	WORKOUT 6		
265	1	6	1 min
	2	6	1 min
	3	6	1 min
	4	6	1 min
	5	5	
	WORKOUT 7		
265	1	6	1 min
	2	6	1 min
	3	6	1 min
	4	6	1 min
	5	6	

Wave Training Method

This training method can boost your strength by up to 10 percent in only six to eight weeks. This is due to the small progressions in weight that take place with each wave. The waves actually allow you to lift up to 102 percent of your current max right off the bat. While that may equate to only a few extra pounds, over six to eight weeks the total expected strength boost is somewhere around 10 percent.

For this program, you'll perform a few warm-up sets, then two or three waves of three sets each, with four minutes of rest between waves and between each set. During wave 1, your first set will consist of three reps with 90 percent RM (a weight you can normally lift for about four reps). Set 2 consists of two reps with 95 percent RM. And on set 3, you'll do one rep with 100 percent RM. On wave 2 you'll increase the weight used on each set by about 1 percent. In other words, set 1 will be about 91 percent RM, set 2 will be 96 percent RM, and set 3 will be 101 percent RM. Because this increment is so small and the smallest Olympic plates are 1.25 pounds, this will equal a 2.5-pound jump on any weight under 400 pounds. For weights of 400 pounds or more, add 5 pounds. In either case, on the third set of wave 2, you'll be lifting more than your current max. If you're up for it, go for a third wave. To do so, simply increase the weight another 1 percent for each set and go for the same number of reps on each set. That means 102 percent of your max on that third set.

The goal of wave training is to increase the weight used on each wave by 1 to 2 percent every workout. Bit by bit, you can notch up your overall strength. But if you aren't successful completing the last set of the last wave of a workout, start the next workout with the same weights you used the previous time and really push to break through on this round. Then you can raise the weight on the next workout.

The reason wave training works has to do with potentiation—similar to the potentiation discussed in the max-out for muscle strength method. The earlier sets prime the nervous system, or the contractile fibers of the muscle, in such a way that the muscle is able to contract with more force on later sets. As most of the strength techniques suggest, reserve this strength training method for the prime strength movements or the exercises you substitute for them. Follow the wave training with three sets of four to six reps on assistance exercises.

Because of the high intensity of this program, you shouldn't train each major lift or muscle group more than once per week. Therefore, the squat–bench press–deadlift training split is ideal to use with wave training. See table 9.20 for a sample wave training deadlift program, set up for a person who can currently deadlift 405 pounds for one rep and wants to get up to 445 pounds. Follow this program for no more than eight weeks.

Rating

Time	1	2	3	**4**	5
Length	**1**	2	3	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	3	**4**	5

Table 9.20 Strong Waves

Set	Weight (pounds)	Reps	Rest
	WARM-UP		
1	135 (~30% 1RM)	10	2 min
2	225 (~55% 1RM)	8	2 min
3	315 (~75% 1RM)	5	4 min
	WAVE 1		
1	365 (90% 1RM)	3	4 min
2	385 (95% 1RM)	2	4 min
3	405 (100% 1RM)	1	4 min
	WAVE 2		
1	367.5 (91% 1RM)	3	4 min
2	387.5 (96% 1RM)	2	4 min
3	410 (101% 1RM)	1	4 min
	WAVE 3 (IF POSSIBLE)		
1	370 (92% 1RM)	3	4 min
2	390 (97% 1RM)	2	4 min
3	415 (102% 1RM)	1	4 min

DeLorme Ascending Strength Pyramid

This program increases weight on each successive set for three sets total until you are doing the appropriate weight for the rep range you are using. For example, on set 1 you perform 10 reps with 50 percent of your 10RM. On set 2 you perform 10 reps with 75 percent of your 10RM. On set 3 you perform 10 reps (or as many reps as it takes to reach failure) with the actual 10RM. The first two sets function as warm-up sets because the weight is relatively light given the number of reps you have to perform. It is just the last set that can be considered a working set.

Although this method may seem like little work to many lifters, this one-working-set scheme may be the reason it works so well to increase strength. It provides a thorough warm-up and allows only one set to failure. This corresponds to research from Australia that supports the notion that one set to failure is superior to no sets to failure as well as more than one set to failure. In fact, a study that investigated the strength gains after following the DeLorme ascending strength pyramid or the Oxford descending pyramid found that the DeLorme method led to greater strength gains than the Oxford method.

When using the DeLorme technique, the repetition maximum is not critical, because many powerlifters use this pyramid method with 3RM, 4RM, 5RM, and 6RM to train for strength. In fact, one way to use this technique is to routinely change the RM. Because there is only one working set per exercise, this program works well with a push–pull training split or an upper- and lower-body powerlifting split. See table 9.21 for a sample DeLorme training program that follows a typical push–pull training split.

Rating

Time	1	**2**	3	4	5
Length	1	2	**3**	4	5
Difficulty	**1**	2	3	4	5
Results	1	2	**3**	4	5

Table 9.21 DeLorme Strength Pyramid

WORKOUT 1: MONDAY AND THURSDAY (PUSH)			
Exercise	**Set**	**Weight**	**Reps**
Squat*	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Leg press	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Leg extension	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Bench press*	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Incline dumbbell press	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Dumbbell shoulder press	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Close-grip bench press	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Standing calf raise	4 sets		8-10
WORKOUT 2: TUESDAY AND FRIDAY (PULL)			
Deadlift	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Lying leg curl	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Barbell row	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Lat pulldown	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Barbell curl	1	50% 5RM	5
	2	75% 5RM	5
	3	100% 5RM	5
Weighted crunch	4 sets		8-10

*Thursday perform bench press and incline dumbbell press before squat

PROGRAMS THAT MANIPULATE REST PERIODS

When it comes to training for strength, rest periods are pretty standard. Most lifters rest a full three minutes between sets and rarely veer from this standard. However, altering rest periods can have a significant impact on strength gains when properly executed. This section covers strength training programs that systematically alter the rest periods involved. This can be done by implementing short rest periods between each rep (as with the rest-pause technique), by progressively lowering the rest between sets every week (as with one-rep to one-set method), or by progressively losing rest time between sets because of an increase in the number of reps performed each week (as found in the density training technique).

Rest-Pause Technique

Rest-pause is a lifting technique that involves stopping during a set, resting for a short period, and then continuing with the set. Its major advantage is that it allows for more total reps to be done with a given weight. That's because it takes advantage of the muscles' ability to recovery rapidly. In simple terms, it allows the muscles time to replenish phosphocreatine (PCr)—the same molecule that creatine supplements boost. With this shot of extra energy, the muscle can contract more strongly, producing greater force and getting more reps. The greater the force your muscle can produce and the more reps you can perform, the greater the stimulus the muscles receive and the greater the gains in strength that you can expect.

The concept behind rest-pause training for strength gains is not necessarily to get more total reps or reach a higher state of fatigue but to optimize the force produced on each rep. To prioritize strength gains with rest-pause, you typically use a weight that allows you to get only three to five reps (3- to 5RM). The most common form of rest-pause training is to choose a weight that you can perform at only about three reps. Do one rep and rack the weight. Rest 15 seconds and then pump out another rep. Repeat this process until you have completed three to five reps total. That concludes one rest-pause set. This technique has been shown to be effective at producing decent strength gains, but it may not be the most effective.

In the laboratory it was discovered that an even better rest-pause technique for building strength involved shorter rest periods—about 3 to 5 seconds. Instead of racking the weight and resting 15 seconds between each rep, you simply hold the weight and rest for 3 to 5 seconds then complete another rep. Do this for a total of three reps. Stopping at three reps allows you to do three sets at the same weight, which maximizes the stimulus the muscle receives. Rest-pause training can work with any training split. To get appreciable results from rest-pause training, you will need to use it consistently for four to six weeks.

Table 9.22 gives a sample bench press routine. Do all three sets using this rest-pause technique and then follow them up with a second exercise for chest (such as incline bench press or dumbbell bench press) for another three sets of rest-pause. You will find that you can use considerably more weight than usual on the second exercise because you will not be as fatigued as you would be with three regular sets.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	3	**4**	5

Table 9.22 A Pause for Strength

Exercise	Weight	Set	Reps	Rest	Comments
Bench press	260	1, 2, 3	1, 1, 1	3 min	Do 3 reps total, each separated by 5 seconds of rest in top position.

One-Rep to One-Set Method

This method takes advantage of time by slowly decreasing the time rested between each exercise until you are doing one continuous set. Doing 10 sets of one rep with the same weight each set is the same amount of work as one set of 10 reps with that same weight. The difference is that doing the work as a single set is harder because of the fatigue that sets in—partly from the increasing levels of lactic acid. If you slowly, over time, reduce the amount of rest between those 10 sets, you will train the muscle to be better at producing the quick energy you need and to deal with the lactic acid—and this obviously will help the muscles grow stronger. The best way to go about this is to start with a weight at which you can do 10 sets of one rep with 90-second rest periods between sets. You then attempt to shave 15 seconds off of the rest periods with each successive workout.

Rating

Time	1	2	3	**4**	5
Length	1	2	3	**4**	5
Difficulty	1	2	**3**	4	5
Results	1	2	**3**	4	5

How this works is simple: Consider that you can lift the weight for 10 reps—just not 10 reps in a row. See table 9.23 for a sample program. This program can be used with any training split.

Table 9.23 Bench Rundown

Follow the bench press workout with standard assistance exercises for three sets of four to six reps.

Workout	Exercise	Sets	Reps	Rest (seconds)
1	Bench press	10	1	90
2	Bench press	10	1	75
3	Bench press	10	1	60
4	Bench press	10	1	45
5	Bench press	10	1	30
6	Bench press	10	1	15
7	Bench press	10	1	10
8	Bench press	10	1	5
9	Bench press	1	10	0

Density Training

Density training is a great way to trick your muscles into lifting more weight for more reps. This is particularly good for increasing strength on body-weight exercises, such as pull-ups, dips, and push-ups (since you can't change your body weight easily), but it can be used for any exercise. Density training begins by doubling the volume of work you want to accomplish. If your goal is to complete 12 reps with a certain amount of weight, then you start off with 12 sets of 2 reps (or 24 total reps) in 12 minutes. So rest is about 50 seconds between sets. Basically you have 1 minute to complete each set and rest before the next set. The more reps you do each set, the less rest you are allowed. After this becomes easy, move to 8 sets of 3 reps in 8 minutes. When this becomes easy, move to 6 sets of 4 reps in 6 minutes, then 5 sets of 5 reps in 5 minutes, then 4 sets of 6 reps in 4 minutes. When this becomes easy, move to 3 sets of 8 reps in 3 minutes. When you've mastered this, you should be able to get 1 set of 12 straight reps. By performing the same overall amount of work (24 reps) and progressively decreasing the amount of rest time, you are increasing the amount of work done during a given amount of time or increasing the density of the work. Density training works because of biochemical adaptations within the muscle cells during the progression of the program.

Rating

Time	1	2	3	**4**	5
Length	1	2	**3**	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	3	**4**	5

Table 9.24 Density Workout

Workout	Sets*	Reps	Rest (seconds)	Total set time (minutes)
1	12	2	50	12
2	8	3	45	8
3	6	4	40	6
4	5	5	35	5
5	4	6	30	4
6	3	8	25	3
7	1	12		1

*As the number of sets decreases, you may find that you cannot complete all the reps. The first time this happens, stay with the same sets and reps on your next workout. If you still cannot complete the full number of reps, move forward anyway. Decrease the sets accordingly and do as many reps as you can. Allow yourself to repeat the same workout only twice.

PROGRAMS THAT MANIPULATE EXERCISE SELECTION

There are countless exercises that you can use to enhance muscle strength. Using the proper exercises can make a huge difference in your strength gains. This section discusses strength training methods that alter the exercises that are used to increase muscle strength. Some of these techniques focus solely on specific types of exercises, such as unilateral training and the dumbbell power program, while others use specific types of exercises in a particular order, such as the three-step strength method, front-to-back training, and ECO training method.

Unilateral Training

Unilateral training refers to training one side of the body at a time. Unlike one-sided training for building muscle mass (covered in chapter 6), unilateral training does not separate training days into left- and right-side workouts. Unilateral training simply uses exercises that are performed with one limb at a time—such as the one-arm dumbbell bench press, the one-leg squat, and even the one-leg, one-arm dumbbell deadlift. Although this approach to training is nothing revolutionary, few powerlifters actually train using unilateral exercises. This is unfortunate, since research confirms that when you train unilaterally the muscles are able to produce more force, and more muscle fibers (particularly fast-twitch muscle fibers) are active. One study comparing unilateral biceps curls to bilateral (both arms) biceps curls reported that the force produced on bilateral biceps curls was up to about 20 percent less than the sum of the force produced from the left- and right-arm unilateral curls. In other words, if you could curl 100 pounds with a barbell for one rep, you would expect to be able to curl only a 50-pound dumbbell with each arm for one rep. In reality, you may be able to curl a 60-pound dumbbell with each arm for one rep. Adding the weight of those dumbbells together would mean that you could curl a total of 120 pounds, or 20 percent more than with both arms at the same time.

To take advantage of the added strength that unilateral training offers, you should periodically do one-arm and one-leg exercises. See table 9.25 for a list of one-arm and one-leg exercises that can be added to a strength training program. Descriptions of how to perform these exercises correctly are found in part IV. A great way to incorporate these exercises into your current strength training program is to include two sets of unilateral versions of the strength lifts after you have completed the working sets of the

Table 9.25 Unilateral Exercises

Muscle group	Exercise
Chest	One-arm dumbbell bench press (flat, incline, decline)
	One-arm dumbbell fly (flat, incline, decline)
Shoulders	One-arm dumbbell overhead press
	One-arm dumbbell upright row
	One-arm dumbbell lateral raise
Back	One-arm dumbbell row
	One-arm cable lat pulldown
Legs	One-leg squat
	One-leg leg press
	One-leg leg extension
	One-leg leg curl
	One-leg, one-arm deadlift
	One-leg Romanian deadlift
Triceps	One-arm dumbbell triceps press
	One-arm triceps pressdown
	One-arm lying triceps extension
Biceps	One-arm dumbbell curl
	Dumbbell concentration curl
	One-arm dumbbell preacher curl

strength lifts. For assistance exercises, do two sets of the unilateral version followed by two sets of the bilateral version for each exercise. See table 9.26 for a sample strength training program that heavily incorporates unilateral exercises into an upper- and lower-body powerlifting split.

Rating

Time	1	2	3	**4**	5
Length	1	2	3	**4**	5
Difficulty	1	2	**3**	4	5
Results	1	2	**3**	4	5

Table 9.26 One Strong Program

Exercise	Sets	Reps
UPPER-BODY WORKOUT 1: MONDAY (BENCH PRESS AND PUSHING EXERCISES)		
Bench press	4	5 with 85% RM
One-arm dumbbell bench press	2	4-6
Dumbbell bench press	2	4-6
One-arm dumbbell shoulder press	2	4-6
Dumbbell shoulder press	2	4-6
One-arm dumbbell upright row	2	6-8
Dumbbell upright row	2	6-8
One-arm dumbbell triceps press	2	4-6
Dumbbell close-grip bench press	2	4-6
Standing crunch	3	8-10
LOWER-BODY WORKOUT 1: TUESDAY (SQUAT AND QUADRICEPS EXERCISES)		
Squat	4	5 with 85% RM
One-leg squat	2	4-6
One-leg leg press	2	4-6
Leg press	2	4-6
One-leg leg extension	2	6-8
Leg extension	2	6-8
Standing calf raise	4	8-10
UPPER-BODY WORKOUT 2: THURSDAY (BENCH PRESS AND PULLING EXERCISES)		
Bench press	4	75%
One-arm dumbbell row	2	4-6
Barbell row	2	4-6
One-arm cable lat pulldown	2	6-8
Lat pulldown	3	6-8
One-arm dumbbell curl	2	6-8
Dumbbell curl	2	6-8
Russian twist	3	20
LOWER-BODY WORKOUT 2: FRIDAY (DEADLIFT AND HAMSTRING EXERCISES)		
Deadlift	4	5 with 85% RM
One-leg, one-arm dumbbell deadlift	2	4-6
One-leg Romanian deadlift	2	6-8
Romanian deadlift	2	6-8
One-leg lying leg curl	2	6-8
Lying leg curl	2	6-8
Seated calf raise	4	10-12

Three-Step Strength Method

This training method incorporates dumbbell, barbell, and machine versions of one exercise in that specific order to enhance muscle strength. While one benefit of this training method is the variety of exercises, the main benefit stems from the order in which you do these exercises. The major reason for this has to do with the stabilizer muscles.

The stabilizer muscles generally lie deep under your major muscle groups (the prime movers). Though the stabilizers are often much smaller and weaker, they're important for securing the joints during various movements. When you train with equipment that's fairly unstable—such as dumbbells—the stabilizer muscles become fatigued much sooner than the muscle group you're trying to work because the stabilizers are weaker. When the stabilizers are fatigued, the brain limits the nervous input to the prime movers in order to prevent injury from occurring. In other words, the stabilizers limit the amount of force the prime movers can produce.

One unorthodox way to train that prevents the stabilizers from being the weak link in your training is to order your exercises in a manner that moves from the least stable exercise to the most stable. This way, as the stabilizer muscles fatigue, you change the exercises to ones that require less activity of the stabilizers. This allows the prime movers to train with heavy weights that are not limited by the fatigue of the stabilizer muscles. The three-step strength method follows this order by starting the workout with dumbbell exercises, which require the most help from the stabilizers because each arm is allowed to move in all directions that the joints will allow. For leg exercises, one-leg exercises would take the place of dumbbell exercises. The workout then moves to a barbell exercise. Because it is a free-weight exercise, you still require some use of stabilizer muscles. But because these exercises are done bilaterally with both arms locked in place on the bar (upper-body exercises) or both legs locked in place on the floor (leg exercises), there is less use of the stabilizers than with dumbbell or unilateral leg exercises. The last type of exercise on the list is a machine exercise. This type of exercise requires barely any help from the stabilizers because the movement of the machine forces your body to follow a predetermined path that doesn't permit deviation. Since the machine is designed to target particular prime movers, the stabilizers are basically not needed.

As an example of a three-step strength method workout for a bench press-focused workout, you would start with the dumbbell bench press, then move to the barbell bench press, and finish with the machine bench press. For a squat-focused workout, you could start with the one-leg squat as the first exercise, then move to the barbell squat as the second exercise, and finish with the leg press. Using this training method for a deadlift-focused workout is not ideal but can be done. For this workout, start with the one-leg, one-arm dumbbell deadlift, then move to the standard deadlift, and finish with a horizontal leg press machine (but start the movement from the down position, which mimics the deadlift).

This training method should not take the place of standard strength training methods that organize the major strength exercises first in the workout. Instead, the best way to use the three-step strength method is to train with it on a second workout for that lift later in the week. For instance, you can do a standard bench press workout early in the week and then do a three-step strength method bench press workout later in the week. This works well with the squat–bench press–deadlift training split by adding a three-step strength method workout on Saturday. An example of this is shown in the workout in table 9.27. Each exercise should be done for 3 working sets. The amount of weight used and the reps performed can be cycled to correspond with your training phase.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	**3**	4	5

Table 9.27 Three-Stepping for Strength

WORKOUT 1: SQUAT DAY (MONDAY)		
Exercise	Sets	Reps
Squat	4	5 with 85% RM
Leg press	3	6-8
Leg extension	3	8-10
Standing calf raise	3	8-10
Cable woodchopper	3	20
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	4	5 with 85% RM
Incline dumbbell press	3	6-8
Barbell shoulder press	4	6-8
Close-grip bench press	4	6-8
Standing crunch	4	8-10
WORKOUT 3: DEADLIFT DAY (THURSDAY)		
Deadlift	4	5 with 85% RM
Good morning	3	6-8
Lying leg curl	3	8-10
Barbell row	4	6-8
Barbell curl	4	6-8
Hanging leg raise	4	10-12
WORKOUT 4: THREE-STEP STRENGTH WORKOUT FOR BENCH PRESS AND SQUAT (SATURDAY)		
Dumbbell bench press	3	6-8
Bench press	3	5 with 80% RM
Machine bench press	3	6-8
One-leg squat	3	6-8
Barbell squat	3	5 with 80% RM
Leg press	3	6-8

Dumbbell Power Program

This is a basic strength training program that uses only dumbbell exercises. Training this way is not any more beneficial than using barbells, but it can work to pull you out of a training slump and get your strength gains climbing again for several reasons. The first reason is the change. Changing your training with different exercises, such as those found in the dumbbell power program, can affect your overall strength by recruiting different muscle fibers that you may have neglected from doing the usual exercises in your routine. Then there's the strength imbalance that most lifters have. Some experience up to a 10 percent difference between their stronger side and weaker side. Unilateral training with dumbbells forces the weaker side to gain strength since that side must lift the dumbbell on its own.

Another benefit of dumbbells is that they can improve the strength of your stabilizer muscles. This can actually enhance overall muscle strength while reducing the risk of injury to your joints. Dumbbell strength training is also great for those who train at home. Dumbbells take up little room, and you can perform a variety of exercises in a minimal amount of space. These exercises are also great for those with shoulder, elbow, or wrist injuries because they allow a freer ROM compared to the ROM allowed with barbells.

The dumbbell power program is a six-week program that involves many multijoint and multimovement exercises that increase overall body strength. See table 9.28 for the outline of the program. Detailed descriptions on how to perform these exercises can be found in part IV. Each workout is done three days per week—usually Monday, Wednesday, and Friday. If you want, you can include one extra training day that hits the squat, bench press, and deadlift. In weeks 1 and 2, you'll train with three sets of 10 to 12 reps with 90 seconds of rest between sets. During weeks 3 and 4, the weight increases and the reps drop to six to eight per set. Increase the rest to two minutes between sets. For the final two weeks (weeks 5 and 6), you increase the weight again and drop the reps to four to six per set. Increase the rest periods again to three minutes between sets to allow ample recovery time. The abdominal and core exercises, however, increase in reps. For these, the weight should stay the same or even increase over the six weeks, and rest should be constant at one minute between sets.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	**3**	4	5

Table 9.28 Six-Week Dumbbell Power Workout

	Weeks 1-2		Weeks 3-4		Weeks 5-6	
Exercise	Sets	Reps	Sets	Reps	Sets	Reps
Dumbbell clean and press	3	10-12	3	6-8	3	4-6
Dumbbell push-up + row	3	10-12	3	6-8	3	4-6
Dumbbell squat + overhead press	3	10-12	3	6-8	3	4-6
Dumbbell pullover + press	3	10-12	3	6-8	3	4-6
Dumbbell deadlift + upright row	3	10-12	3	6-8	3	4-6
Dumbbell kickback	3	10-12	3	6-8	3	4-6
Standing alternating dumbbell curl	3	10-12	3	6-8	3	4-6
Dumbbell woodchopper	3	10-12	3	12-15	3	15-20
Dumbbell V-sit	3	10-12	3	12-15	3	15-20

Front-to-Back Training

This training method involves training opposing muscle groups and exercise movements to increase muscle strength. With this method, you train exercises that are opposing movements and train opposing muscle groups back to back. That is, you do one set of the first exercise and follow it with one set of an exercise that is the opposite movement of that first exercise. This is similar to superset training with a longer rest period allowed between the opposing exercises. For example, during front-to-back training you will train the bench press and barbell row together.

The advantage of training opposing muscle groups back to back is that you'll be stronger in the second exercise. Research has found that a muscle will be stronger if preceded immediately by a contraction of its antagonist, or opposing muscle group. For example, when you do a superset of barbell row and bench press in that order, you'll be stronger on the bench press—as long as you don't train to failure on the row. The reason for this phenomenon is that, to some degree, the agonist muscle is limited by its antagonist. When bench-pressing using straight sets, for example, the back muscles inhibit the contraction of the pectoral muscles to a certain extent. Doing a set of rows shortly before benching, however, lessens this inhibitory effect, allowing your pecs to contract more forcefully.

The front-to-back training routine presented in table 9.29 uses an upper- and lower-body training split for a total of four workouts per week. The upper-body workout is done on Mondays and Thursdays, and the lower-body workouts are done on Tuesdays and Fridays. On the Thursday upper-body workout, you should switch the order of the exercise pair on all exercises except the bench press. The Tuesday lower-body workout focuses on the squat, and the Friday lower-body workout focuses on the deadlift. You will do five sets of each exercise pair. The first exercise should be done for no more than five reps with a weight that is about 50 to 70 percent RM (a weight that allows you to complete about 12 to 20 reps) for that exercise. The key is doing these reps explosively and not fatiguing the muscles. Rest no more than 60 seconds between exercises and do four to six reps on the second exercise. Normally that would be a weight that is about 85 to 90 percent RM. However, the additional strength you get from the antagonist exercise may allow you to complete four to six reps with up to 95 percent RM. After completing the fifth set of the second exercise, do one set to failure of the first exercise with a weight that normally allows you to complete about 8 to 10 reps. Follow this program for no more than six weeks before cycling back to standard straight-set training.

Rating

Time	1	**2**	3	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	**3**	4	5
Results	1	2	3	**4**	5

Table 9.29 Front-to-Back Strength

MONDAY AND THURSDAY: UPPER-BODY WORKOUT			
		Exercise 1	Exercise 2
Exercise pair	Sets	Reps	Reps
Barbell row and bench press	5	2-3	4-6
Lat pulldown and overhead press	5	2-3	4-6
Barbell curl and triceps dip	5	2-3	4-6
Back extension and weighted crunch	5	5-6	8-10
TUESDAY: SQUAT LOWER-BODY WORKOUT			
Hanging leg raise (with dumbbell) and squat	5	2-3	4-6
Seated or lying leg curl and leg extension	5	3-4	6-8
Seated toe raise and seated calf raise	5	5-6	6-8
FRIDAY: DEADLIFT LOWER-BODY WORKOUT			
Hanging leg raise (with dumbbell) and deadlift	5	2-3	4-6
Leg raise and Romanian deadlift	5	5-6	6-8
Leg extension and seated or lying leg curl	5	3-4	6-8
Standing toe raise and standing calf raise	3	5-6	6-8

ECO Training Method

This method of training incorporates three different types of exercises that all offer a distinct benefit to build strength. The acronym ECO stands for explosive exercise, closed-chain exercise, open-chain exercise. Explosive exercises are plyometric, or ballistic-type movements (discussed earlier in ballistic strength training), such as the squat jump and bench press throw. Closed-chain exercises are those where your hands or feet remain stationary and your body moves, such as squats, push-ups, and pull-ups. Open-chain exercises are those where the resistance is in your hands or at your feet, such as leg extensions and most dumbbell upper-body exercises. The ECO workout progresses in that exact order—the explosive exercise is done first, followed by the closed-chain exercise, and finishing with the open-chain exercise.

You must do the explosive exercises first while the muscle fibers are fresh. If the muscle fibers are fatigued when you do them, they won't be able to contract as quickly and explosively. In addition, because these moves are performed with such quick movements, there could be a higher risk of injury if you are fatigued. Explosive moves target the fast-twitch muscle fibers. Gaining explosive strength or power from these exercises translates to greater strength on other exercises, such as the squat and bench press. You will do no more than three reps on the explosive exercises. The point is to be explosive on all three sets of three reps, not to tire the muscle. You will use a very light weight (just your body weight or a weight with which you can perform about 25 to 30 normal reps on the exercise, or about 30 to 50 percent RM).

The closed-chain exercises force your body to move while your hands or feet are stationary. These types of exercises are great for building strength in the muscle you are training. They also develop functional strength because they require balance and the use of stabilizers to move your body. Because the only true closed-chain chest exercise is the push-up, the bench press is substituted in this ECO program. The problem with the push-up is that it's difficult to increase the resistance to fall in the proper rep range of four to six. If you are willing, however, you can do weighted push-ups by having someone sit on your back or load plates on your back, or you can do push-ups with the bar of a Smith machine loaded on your back.

An open-chain exercise is anything that involves holding the weight in your hands (dumbbell fly) or having the weight at your feet (leg extension). In the ECO program closed-chain exercises are used as isolation exercises to focus the force onto the

muscle of interest for enhancing muscle growth. For the open-chain exercises, perform 8 to 10 reps per set.

The best split to use with the ECO program is the upper- and lower-body training split as shown in table 9.30. Follow the program for four weeks and then return to your standard form of training.

Rating

Time	1	2	**3**	4	5
Length	1	**2**	3	4	5
Difficulty	1	2	3	**4**	5
Results	1	2	3	**4**	5

Table 9.30 ECO-Friendly Strength Program

Muscle group	Exercise	Sets	Reps
UPPER-BODY WORKOUT 1: MONDAY (BENCH PRESS AND PUSHING EXERCISES)			
Chest	E: Power push-up	3	3
	C: Bench press	3	4-6
	O: Dumbbell fly	3	8-10
Shoulders	E: Overhead press throw (Smith machine)	3	3
	C: Barbell shoulder press	3	4-6
	O: Dumbbell lateral raise	3	8-10
Triceps	E: Close-grip bench press throw	3	3
	C: Dips	3	4-6
	O: Skull crusher	3	8-10
LOWER-BODY WORKOUT 1: TUESDAY (SQUAT AND QUADRICEPS EXERCISES)			
Quadriceps	E: Barbell squat jump	3	3
	C: Barbell squat	3	4-6
	O: Leg extension and leg curl*	3	8-10
Calves	Standing calf raise	3	8-10
Abs	Standing crunch	3	8-10
UPPER-BODY WORKOUT 2: THURSDAY (BENCH PRESS AND PULLING EXERCISES)			
Chest	E: Bench press throw (Smith machine)	3	3
	C: Weighted push-up	3	4-6
	O: Incline dumbbell fly	3	8-10
Back	E: One-arm row pull (Smith machine)	3	3
	C: Pull-up	3	4-6
	O: Straight-arm pulldown	3	8-10
Biceps	E: Biceps curl throw	3	3
	C: Close-grip chin-up	3	4-6
	O: Incline dumbbell curl	3	8-10
LOWER-BODY WORKOUT 2: FRIDAY (DEADLIFT AND HAMSTRING EXERCISES)			
Quadriceps	E: Dumbbell deadlift jump	3	3
	C: Deadlift	3	4-6
	O: Leg curl	3	8-10
Calves	Standing calf raise	3	8-10
Abs and core	Russian twist	3	12-15

*Perform as a superset.

PROGRAMS THAT MANIPULATE TRAINING FREQUENCY

This section covers strength training methods that modify the frequency of training. There are only two programs covered here because few lifters interested in training for strength view training frequency as an important variable to cycle in an effort to increase muscle strength. However, changing the frequency of your training can have a dramatic effect on gains in muscle strength. The overreaching method and the up-and-down strength method are two programs that are effective at enhancing strength by manipulating the frequency of training.

Overreaching Method

This program actually causes you to overtrain in an effort to increase strength. The program design is based on research investigating overtraining in athletes. But the concept is not all that new. It originated from training principles from the Eastern Bloc countries. Overreaching is basically overtraining without suffering from the negative effects of overtraining. The trick is backing off at the right time. The difference between overtraining and overreaching is mainly time. Overtraining is a more chronic situation. It's not something that can just happen in a couple of days; it may take two to four weeks of training too heavily or too long to become truly overtrained. By then hormonal perturbations usually have surfaced and so will the classic signs: fatigue, loss of appetite, lack of strength, muscle loss, insomnia, and depression.

Overreaching is similar to overtraining in that the training is the same. The difference is that overreaching is for a short period and ends before the catastrophic changes in your body's physiology have taken place. In other words, overreaching is overtraining before the overtrained state is reached. For four weeks you will train all muscle groups five days per week. See table 9.31 for the outline of the overreaching training split. You will do three sets per exercise; each week the weight increases and the reps decrease. The exception is the Friday workout, where you train using maximal effort (up to 100 percent RM) on the squat, bench press, and deadlift. At the end of the four weeks, you back off on the training frequency as well as the weight and slow it down to training each muscle group just once per week with a squat–bench press–deadlift training split. During this back-off phase your strength will increase dramatically. In fact, in the study that the overreaching method is based on, researchers discovered that after two weeks on the back-off phase, the trained lifters had increases in 1RM strength of more than 10 percent on both the bench press and squat.

Rating

Time	1	2	3	4	**5**
Length	1	2	**3**	4	5
Difficulty	1	2	3	4	**5**
Results	1	2	3	**4**	5

Table 9.31 Overreaching for Strength

WEEKS 1-4 MONDAY AND WEDNESDAY									
	Week 1		Week 2		Week 3		Week 4		Rest between
Exercise	Sets	Reps	Sets	Reps	Sets	Reps	Sets	Reps	sets (minutes)
Squat	3	10-12	3	8-10	3	6-8	3	4-6	3
Lunge	3	10-12	3	8-10	3	6-8	3	4-6	2
Bench press	3	10-12	3	8-10	3	6-8	3	4-6	3
Barbell shoulder press	3	10-12	3	8-10	3	6-8	3	4-6	2
Lat pulldown	3	10-12	3	8-10	3	6-8	3	4-6	2
Dumbbell curl	3	10-12	3	8-10	3	6-8	3	4-6	2
Lying triceps extension	3	10-12	3	8-10	3	6-8	3	4-6	2
Standing calf raise	3	15-20	3	12-15	3	10-12	3	8-10	1
Hanging leg raise	3	15-20	3	15-20	3	15-20	3	15-20	1

TUESDAY AND THURSDAY									
	Week 1		Week 2		Week 3		Week 4		Rest between
Exercise	Sets	Reps	Sets	Reps	Sets	Reps	Sets	Reps	sets (minutes)
Bench press	3	10-12	3	8-10	3	6-8	3	4-6	3
Deadlift	3	10-12	3	8-10	3	6-8	3	4-6	3
Leg press	3	10-12	3	8-10	3	6-8	3	4-6	3
Upright row	3	10-12	3	8-10	3	6-8	3	4-6	2
Barbell row	3	10-12	3	8-10	3	6-8	3	4-6	2
Barbell curl	3	10-12	3	8-10	3	6-8	3	4-6	2
Dips	3	10-12	3	8-10	3	6-8	3	4-6	2
Seated calf raise	3	15-20	3	12-15	3	10-12	3	8-10	1
Crunch	3	20	3	20	3	20	3	20	1

FRIDAY			
Exercise	Sets	Reps	% 1RM
Follow this set, rep, and % 1RM scheme for the squat, bench press, and deadlift	1	5	10%
	1	5	20%
	1	5	30%
	1	3	40%
	1	3	50%
	1	3	60%
	1	1	70%
	1	1	80%
	1	1	90%
	1	1	95%
	1	1	100%

WEEKS 5-6

WORKOUT 1: SQUAT DAY (MONDAY)			
Exercise	Sets	Reps	% 1RM
Squat	4	8-10	75%
Leg press	3	8-10	
Leg extension	3	8-10	
Standing calf raise	3	8-10	
Cable woodchopper	3	20	
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)			
Bench press	4	8-10	75%
Incline dumbbell press	3	8-10	
Barbell shoulder press	4	8-10	
Close-grip bench press	4	8-10	
Standing crunch	4	8-10	
WORKOUT 3: DEADLIFT DAY (FRIDAY)			
Deadlift	4	8-10	75%
Good morning	3	8-10	
Lying leg curl	3	8-10	
Barbell row	4	8-10	
Barbell curl	4	8-10	

Up-and-Down Strength Program

This six-week strength training program cycles the training frequency every week by switching up training splits. The program, shown in table 9.32, starts with a whole-body strength training split, which works each muscle group three times per week. The second week switches to a push–pull training split, which trains each muscle group twice per week. The third week uses a squat–bench press–deadlift training split, which trains each muscle group once per week. At the fourth week the cycle starts all over but the reps change from about six to eight per set or 80 percent RM for the major strength lifts to two or three reps or 95 percent RM for the major strength lifts. This program works to increase strength by gradually increasing the recovery time the muscles receive each week.

Rating

Time	1	2	**3**	4	5
Length	1	2	**3**	4	5
Difficulty	1	**2**	3	4	5
Results	1	2	3	**4**	5

Table 9.32 Strong Split

WEEK 1

WORKOUT 1: MONDAY (SQUAT FOCUS)

Exercise	Sets	% 1RM or reps
Squat	4	6-8 with 80% RM
Leg press	3	6-8
Incline bench press	4	6-8
Dumbbell shoulder press	3	6-8
Barbell row	3	6-8
Stiff-leg deadlift	3	6-8
Close-grip bench press	3	6-8
Dumbbell curl	3	6-8
Hanging leg raise	3	10-12

WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)

Bench press	4	6-8 with 80% RM
Dumbbell bench press	3	6-8
Barbell hack squat	3	6-8
Barbell shoulder press	3	6-8
Deadlift	3	6-8 with 80% RM
Dumbbell row	3	6-8
Triceps dip	3	6-8
Barbell curl	3	6-8
Cable woodchopper	3	20

WORKOUT 3: FRIDAY (DEADLIFT FOCUS)

Deadlift	4	6-8 with 80% RM
One-arm dumbbell deadlift	3	6-8
Bench press	3	6-8
Upright row	3	6-8
Lat pulldown	3	8-10
Lying triceps extension	3	6-8
Preacher curl	3	6-8
Back extension	3	15-20

WEEK 2

WORKOUT 1: MONDAY AND THURSDAY (PUSH)

Squat*	4	6-8 with 80% RM
Leg press	3	6-8
Leg extension	3	6-8
Bench press*	4	6-8 with 80% RM
Incline dumbbell press	3	6-8
Dumbbell shoulder press	4	6-8
Close-grip bench press	4	6-8
Standing calf raise	4	8-10

WORKOUT 2: TUESDAY AND FRIDAY (PULL)

Deadlift	4	6-8 with 80% RM
Lying leg curl	3	6-8
Barbell row	4	6-8
Lat pulldown	3	6-8
Barbell curl	4	6-8
Weighted crunch	4	8-10

WEEK 3

WORKOUT 1: SQUAT DAY (MONDAY)

Squat	4	6-8 with 80% RM
Leg press	3	6-8
Leg extension	3	6-8

Exercise	Sets	% 1RM or reps
Standing calf raise	3	12-15
Cable woodchopper	3	12
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	4	6-8 with 80%
Incline dumbbell press	3	6-8
Barbell shoulder press	4	6-8
Close-grip bench press	4	6-8
Standing crunch	4	8-10
WORKOUT 3: DEADLIFT DAY (FRIDAY)		
Deadlift	4	6-8 with 80% RM
Good morning	3	6-8
Lying leg curl	3	6-8
Barbell row	4	6-8
Barbell curl	4	6-8
WEEK 4		
WORKOUT 1: MONDAY (SQUAT FOCUS)		
Squat	4	2-3 with 95% RM
Leg press	3	2-3
Incline bench press	4	2-3
Dumbbell shoulder press	3	2-3
Barbell row	3	2-3
Stiff-leg deadlift	3	4-6
Close-grip bench press	3	2-3
Dumbbell curl	3	4-6
Hanging leg raise	3	12-15
WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)		
Bench press	4	2-3 with 95% RM
Dumbbell bench press	3	2-3
Barbell hack squat	3	2-3
Barbell shoulder press	3	2-3
Deadlift	3	2-3 with 95% RM
Dumbbell row	3	2-3
Triceps dip	3	4-6
Barbell curl	3	4-6
Cable woodchopper	3	25
WORKOUT 3: FRIDAY (DEADLIFT FOCUS)		
Deadlift	4	2-3 with 95% RM
One-arm dumbbell deadlift	3	2-3
Bench press	3	2-3
Upright row	3	4-6
Lat pulldown	3	4-6
Lying triceps extension	3	4-6
Preacher curl	3	4-6
Back extension	3	15-20
WEEK 5		
WORKOUT 1: MONDAY AND THURSDAY (PUSH)		
Squat*	4	2-3 with 95% RM
Leg press	3	2-3
Leg extension	3	4-6
Bench press*	4	2-3 with 95% RM
Incline dumbbell press	3	2-3
Dumbbell shoulder press	4	2-3
Close-grip bench press	4	2-3
Standing calf raise	4	6-8
WORKOUT 2: TUESDAY AND FRIDAY (PULL)		
Deadlift	4	2-3 with 95%
Lying leg curl	3	4-6
Barbell row	4	2-3
Lat pulldown	3	4-6
Barbell curl	4	4-6
Weighted crunch	4	6-8
WEEK 6		
WORKOUT 1: SQUAT DAY (MONDAY)		
Squat	4	2-3 with 95%RM
Leg press	3	2-3
Leg extension	3	4-6
Standing calf raise	3	10-12
Cable woodchopper	3	15
WORKOUT 2: BENCH PRESS DAY (WEDNESDAY)		
Bench press	4	2-3 with 95% RM
Incline dumbbell press	3	2-3
Barbell shoulder press	4	2-3
Close-grip bench press	4	2-3
Standing crunch	4	6-8
WORKOUT 3: DEADLIFT DAY (FRIDAY)		
Deadlift	4	2-3 with 95% RM
Good morning	3	2-3
Lying leg curl	3	4-6
Barbell row	4	2-3
Barbell curl	4	4-6

*Thursday perform bench press and incline dumbbell press before squat.

CHAPTER 10

Training Cycles for Gaining Maximal Strength

The fundamentals of strength training covered in part I will help you understand how to design effective strength training programs. This chapter is designed to help you take the information you have learned from chapter 8 (basic program design for training programs that build maximal strength) and chapter 9 (advanced training techniques) and put it together to build a long-term training program that works to continually build strength.

This chapter starts by teaching you how to test your 1RM. Regardless of your training level, you need to asses your strength level accurately for best results from your training. The first training program offered in this chapter is a beginner program. If you have little experience in strength training, this program will enable you to take on the basic strength programs that are most effective for gaining strength. Once you have followed a strength training program consistently for at least six months, you are ready to take on an effective program based on the splits discussed in chapter 8. If you are at the intermediate level, these programs use the percentage method of training. This is a training system that gradually increases the weight used by a percentage of the 1RM.

Advanced lifters, those with over a year of strength training experience, can begin using the methods and techniques covered in chapter 9. One cycle found in the following section is an advanced program that alters these techniques throughout the different phases. Finally, if you are interested in increasing your strength in one lift, you can refer to the sections that focus on just one lift.

TESTING ONE-REPETITION MAXIMUM

Regardless of where they are starting from, all lifters interested in training to build maximal strength have one goal in common—more strength! With the exception of powerlifters, who commonly test their 1RM strength in competition, most lifters do not routinely test their strength by maxing out. *Maxing out,* a slang term, means to test your strength by seeing how much weight you can lift for one ultimate rep on an exercise (usually on the three strength moves: bench press, squat, and deadlift). Anyone who is interested in developing muscle strength needs to routinely test 1RM strength on the bench press, squat, and deadlift.

Assessing your strength on the bench press, squat, and deadlift is important for several reasons. Because the bench press represents upper-body strength, the squat represents lower-body strength, and the deadlift represents whole-body strength, knowing your maximal strength on each of these lifts will give you an indication of your overall body strength as well as indicate any strength imbalances you may have. Norms have been established that indicate how strong a person should be on each of these lifts. For strength norms relative to body weight, refer to table 10.1. Testing your 1RM on the bench press, squat, and deadlift and comparing your relative strength on each to the established norms will indicate how your strength levels compare to the strength levels of others. You can do this by dividing your 1RM in pounds on each lift by your body

weight in pounds. For example, if your bench press 1RM is 300 pounds and you weigh 150 pounds (68 kilograms), your relative strength on the bench press is 2. The sidebar on page 201 provides a ratio of squat to deadlift to bench press strength. Comparing your own 1RM strength ratios of these three lifts can indicate whether you have balanced strength or whether you are particularly weak or strong on a particular lift. Knowing whether you have an imbalance can help you tailor your training to work toward improving the weaker lifts.

Another important reason to assess your 1RM strength on the bench press, squat, and deadlift is to determine the training weights that will correspond to each phase of your strength training program. When training for strength, you will train using a percentage of your 1RM on the major lifts—such as 85 percent of the 1RM or 85 percent RM. The only way to know how much weight you should train with is to know how much your 1RM is. For example, if your current 1RM on the squat is 400 pounds and you are in a training phase that requires 85 percent RM, then you should train with 340 pounds on the squat. This requires frequent retesting because your strength will increase while you are training with effective strength programs. You should plan on testing your 1RM about once every four to six weeks to keep your training weights accurate with your current level of strength.

Last and most obvious, it's important to test your 1RM strength to assess the effectiveness of each program you use in your strength training regimen. Knowing your 1RM for the bench press, squat, and deadlift (or any other exercise you want to increase your strength on) before you start a program and after you finish it is the only way to determine how effective a strength training program is and whether you should consider using the same program in the future.

To test your maximal strength on an exercise, you must have a capable spotter to assist you, because to determine a true 1RM, you must reach muscle failure. The first step to testing your 1RM is to do several light warm-up sets starting with the bar itself and gradually move up in weight over those several sets until you are close to your true 1RM weight. Rest three minutes after your final warm-up before testing your 1RM. Estimate a conservative 1RM weight and try it for one rep. Rest three to four minutes before making another attempt. If you failed on the second attempt, subtract 5 to 10 pounds and try again. If you were successful on the attempt, add 5 to 10 pounds and try another attempt. Keep doing this, resting three to four minutes between sets until you fail an attempt. The weight you lifted on the prior set is your true 1RM.

Although not considered nearly as accurate, it is possible to estimate your 1RM without doing a true 1RM test. There are several equations that you can use to estimate 1RM based on how many reps you can complete with a certain amount of weight. This is a good option if you have an injury that could be worsened by training with extremely heavy weight or if you want to avoid doing a true 1RM for whatever reason. The most commonly used equation is the Epley formula, also known as the Nebraska formula:

$$1RM = [1 + (0.0333 \times \text{reps completed})] \times \text{weight lifted}$$

Using this equation, if you completed 10 reps on the bench press with 225 pounds, then

$$1RM = [1 + (0.0333 \times 10)] \times 225 \text{ pounds}$$

$$1RM = 1.333 \times 225 \text{ pounds}$$

$$1RM = 300 \text{ pounds}$$

After estimating your 1RM with the Nebraska formula, use that weight to determine your relative strength, your training weight, or how much progress you have made with a particular strength program.

Table 10.1 Relative Strength

Values listed as "good" represent 1RM that is greater than the general population. Values listed as "excellent" represent observed 1RM values for advanced lifters. Values listed as "elite" represent observed 1RM values for competitive-level powerlifters.

Rating	Male	Female
	BENCH PRESS	
Good	>1.25 × body weight	>0.8 × body weight
Excellent	≥1.75 × body weight	1 × body weight
Elite	≥2 × body weight	≥1.25 × body weight
	SQUAT	
Good	>2 × body weight	>1.5 × body weight
Excellent	≥2.5 × body weight	≥2 × body weight
Elite	≥3 × body weight	≥2.5 × body weight
	DEADLIFT	
Good	≥2 × body weight	≥1.5 × body weight
Excellent	≥2.5 × body weight	≥2 × body weight
Elite	≥3 × body weight	≥2.5 × body weight

Balanced Strength

Here we list the suggested ratio of bench press to squat to deadlift 1RM weight. This can be used to determine whether your upper-body, lower-body, and overall strength are balanced. Having a ratio on a lift that is much higher or lower than the suggested ratios would indicate areas in which you should work on bringing your strength up to par with the others.

A balanced ratio of bench to squat to deadlift is 1:1.5:1.5.*

For example, if your bench press is 300 pounds, your squat is 450 pounds, and your deadlift is 425 pounds (300:450:425), your ratio would be 1:1.5:1.4.

This would suggest your strength in these three lifts is balanced.

If your bench press is 300 pounds, your squat is 700 pounds, and your deadlift is 650 pounds (300:700:650), your ratio would be 1:2.33:2.17.

This would suggest your strength on the bench press is well below your squat and deadlift strength. This means your training should focus on bringing up your bench press and upper-body strength.

*In practice the weight for the deadlift tends to be slightly less than the weight for the squat.

BEGINNER OVERALL STRENGTH PROGRAM

If you have more than six months of consistent lifting experience, you can take on the majority of basic strength training programs that are designed to build maximal strength. The reason is that most programs for developing maximal strength start with lighter weight and higher reps and gradually increase the weight and decrease the reps performed. This systematic progression can prepare you to hoist heavy weights. However, if you have less than six months of experience, you are a special case because of the immaturity of your nervous system in regard to the specific exercises that you perform in your training regimen. Any time the body learns a new movement pattern—such as the barbell squat—it requires time for nerve connections to be strengthened and muscle fiber contractions to be synchronized. These adaptations of the nervous system can have a dramatic effect on strength gains in a short period of time. It is these adaptations that make up the majority of the strength gains that beginners make. Therefore, you should design a beginner strength training program to enhance these adaptations.

To enhance the neural adaptations that you need as a beginning lifter, this program emphasizes repetition—that is in the number of reps performed per set and the frequency of training. The training split used is a whole-body strength training split done on Monday, Wednesday, and Friday, or any three days per week allowing one full day of rest between workouts (see table 10.2). In each workout a different strength exercise is emphasized and performed as the first exercise of the workout. Training the same exercises three times per week helps the nervous system to "learn" the movement patterns of the exercise, strengthening the nerve connections that are required. During the first three months of the program, the assistance exercises stay the same for every workout (except for abdominal and core exercises). In the last three months, the assistance exercises are switched up in each workout to provide better variety in an effort to stimulate different muscle fibers, which may help to enhance strength on the three lifts.

The repetitions start out very high (20 per set for the first four weeks) and progressively drop every four weeks as the weight increases. This first four-week phase starts with weights equal to 55 percent RM on most lifts. This is a great starting weight if you are unaccustomed to doing particular exercises. The high reps further enhance the nerve connections and synchronicity of muscle fiber contractions that you need to develop to perform the exercises with correct form and maximal force. Sets start out at three per exercise for all exercises for the first three months. During the fourth and fifth months, you will perform all exercises for four sets. Then in the last month, you will bump up the sets to five on the three major lifts—but just on the workout in which you perform that exercise first. In the other workouts, sets remain at four. During the second phase the weight increases to 65 percent RM and reps drop to 15 per set. The third phase increases weight to 70 percent RM and drops reps to 12 per set. In phase 4, weight increases to 75 percent RM and reps are 10 per set. Phase 5 uses weights that are 80 percent RM for reps of 8 per set. In the final four weeks, weights are increased to 85 percent RM as reps drop down to 6 per set.

During this program 1RM testing should take place during the last week of each phase. Each of

Table 10.2 Beginnings of Strength

WORKOUT 1: MONDAY (SQUAT FOCUS)									
	Weeks 1-4			Weeks 5-8			Weeks 9-12		
Exercise	Sets	Reps	Weight	Sets	Reps	Weight	Sets	Reps	Weight
Squat	3	20	55% RM	3	15	65% RM	3	12	70% RM
Bench press	3	20	55% RM	3	15	65% RM	3	12	70% RM
Barbell shoulder press	3	20		3	15		3	12	
Deadlift	3	20	55% RM	3	15	65% RM	3	12	70% RM
Barbell row	3	20		3	15		3	12	
Close-grip bench press	3	20		3	15		3	12	
Barbell curl	3	20		3	15		3	12	
Hanging leg raise	3	12		3	15		3	15-20	
WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)									
Bench press	3	20	55% RM	3	15	65% RM	3	12	70% RM
Squat	3	20	55% RM	3	15	65% RM	3	12	70% RM
Barbell shoulder press	3	20		3	15		3	12	
Deadlift	3	20	55% RM	3	15	65% RM	3	12	70% RM
Barbell row	3	20		3	15		3	12	
Close-grip bench press	3	20		3	15		3	12	
Barbell curl	3	20		3	15		3	12	
Cable woodchopper	3	12		3	15		3	15-20	

WORKOUT 3: FRIDAY (DEADLIFT FOCUS)									
	Weeks 13-16			Weeks 17-20			Weeks 21-24		
Exercise	Sets	Reps	Weight	Sets	Reps	Weight	Sets	Reps	Weight
Deadlift	3	20	55% RM	3	15	65% RM	3	12	70% RM
One-arm dumbbell deadlift	3	20		3	15		3	12	
Bench press	3	20	55% RM	3	15	65% RM	3	12	70% RM
Upright row	3	20		3	15		3	12	
Lat pulldown	3	20		3	15		3	12	
Lying triceps extension	3	20		3	15		3	12	
Preacher curl	3	20		3	15		3	12	
Back extension	3	12		3	15		3	15-20	
WORKOUT 1: MONDAY (SQUAT FOCUS)									
Squat	4	10	75% RM	4	8	80% RM	5	6	85% RM
Leg press	4	10		4	8		4	6	
Bench press	4	10	75% RM	4	8	80% RM	4	6	85% RM
Dumbbell shoulder press	4	10		4	8		4	6	
Barbell row	4	10		4	8		4	6	
Deadlift	4	10	75% RM	4	8	80% RM	4	6	85% RM
Close-grip bench press	4	10		4	8		4	6	
Dumbbell curl	4	10		4	8		4	6	
Standing crunch	4	12		4	10		4	8	
WORKOUT 2: WEDNESDAY (BENCH PRESS FOCUS)									
Bench press	4	10	75% RM	4	8	80% RM	5	6	85% RM
Incline dumbbell press	4	10		4	8		4	6	
Squat	4	10	75% RM	4	8	80% RM	4	6	85% RM
Barbell shoulder press	4	10		4	8		4	6	
Deadlift	4	10	75% RM	4	8	80% RM	4	6	85% RM
Dumbbell row	4	10		4	8		4	6	
Triceps dip	4	10		4	8		4	6	
Barbell curl	4	10		4	8		4	6	
Russian twist	4	12		4	15		4	15-20	
WORKOUT 3: FRIDAY (DEADLIFT FOCUS)									
Deadlift	4	10	75% RM	4	8	80% RM	5	6	85% RM
One-arm dumbbell deadlift	4	10		4	8		4	6	
Bench press	4	10	75% RM	4	8	80% RM	4	6	85% RM
Upright row	4	10		4	8		4	6	
Lat pulldown	4	10		4	8		4	6	
Squat	4	10	75% RM	4	8	80% RM	4	6	85% RM
Lying triceps extension	4	10		4	8		4	6	
Preacher curl	4	10		4	8		4	6	
Good morning	4	10		4	8		4	6	

the three exercises will be tested on the workout in which you perform them first. After testing for the 1RM on that exercise, finish with three sets of that exercise with the prescribed weight and rep scheme for that phase. At the end of this six-month program, you are ready to progress to any of the other training programs discussed in this chapter. However, you should pick up with the intermediate strength training cycles.

INTERMEDIATE STRENGTH TRAINING CYCLES

Once you have been training consistently for more than six months, you are ready to take on most of the basic strength programs that follow a sound progression of increases in weight. Most strength programs follow some form of gradually increasing the percent RM used for training. This method is known as the percentage method of training and is the most commonly used method for increasing strength. The major differences between most training programs for developing strength involve the training split, the length of the program, the starting percent RM, and the finishing percent RM. The three training cycles that follow do not provide exercise choices. They list only the time line, the number of sets per exercise, the number of reps per set, the working weight (as percent RM), and the rest allowed between sets. Choose any training split provided in chapter 8 (to provide exercise choices and order as well as workouts per week) and apply it to these cycles.

Small-Step Cycle

You can use this 20-week basic periodized scheme with any training split. It follows the classical periodization format but increases the weight in very small increments each week—usually just 2 to 3 percent of the 1RM. See table 10.3 for the details of the small-step cycle. Depending on the weight of your 1RM, these increments may be as small as 2.5 pounds (the smallest increment available with weight plates) or as high as 25 pounds (for elite powerlifters with lifts up to 800 pounds). This constant and small increase in weight used each week is often referred to as *microloading*. It is believed that constantly challenging the muscle with progressively heavier weights forces the muscles to adapt by increasing their capacity to produce force (that is, muscle strength). This follows the principle of progressive overload. In addition to the prescribed percent RM used each week, this cycle has scheduled retesting of the 1RM. This allows for fine-tuning of the percent RM as the 1RM will increase over the course of the training cycle.

Table 10.3 Small Steps to Strength

Week	Sets	Reps	Weight (% RM)	Rest (minutes)
HYPERTROPHY PHASE				
1*	5	15	55%	1-2
2	4	15	57%	1-2
3	3	12	60%	1-2
4	3	12	62%	1-2
5*	3	10	65%	1-2
STRENGTH PHASE				
6	5	10	67%	2
7	5	8	70%	2
8	4	8	73%	2
9*	4	7	75%	2
10	3	6	77%	2
POWER PHASE				
11	3	6	80%	3
12	3	4	82%	3
13*	3	4	85%	3
14	3	3	87%	3
PEAKING CYCLE				
15	3	3	90%	4
16	2	2	92%	4
17*	2	1	95%	5
18	2	1	97%	5
19	Off or active rest			
20*	Competition or testing of 1RM			

*1RM test week.

Countdown Cycle

Although all the basic strength training programs have some form of gradual progression where the reps performed at each workout decrease over time, the countdown cycle uses a corresponding system that matches sets, reps, and weeks that each phase is followed in a 6, 5, 4, 3, 2, 1 countdown progression. See table 10.4 for the weekly

progression of the countdown cycle. To expand on this, the first phase lasts six weeks and uses six sets of six reps for each exercise. The next phase lasts five weeks and uses five sets of five reps. This pattern continues with each phase dropping one week, one set, and one rep until the final week, where one set of one maximal rep is performed for each exercise. As with all the basic percentage method strength programs, this works well with any split discussed in chapter 8.

Table 10.4 Strength Countdown

Week	Sets	Reps	Weight (% RM)	Rest (minutes)
PHASE 6				
1*	6	6	55%	1-2
2	6	6	55%	1-2
3	6	6	55%	1-2
4	6	6	60%	1-2
5*	6	6	60%	1-2
6	6	6	60%	1-2
PHASE 5				
7	5	5	65%	2
8	5	5	65%	2
9*	5	5	65%	2
10	5	5	70%	2
11	5	5	70%	2
PHASE 4				
12	4	4	75%	3
13*	4	4	75%	3
14	4	4	80%	3
15	4	4	80%	3
PHASE 3				
16	3	3	85%	4
17*	3	3	85%	4
18	3	3	85%	4
PHASE 2				
19	2	2	90%	5
20	2	2	95%	5
PHASE 1				
21*	1	1	100%	5

*1RM test week.

9 to 5 Cycle

This training cycle is simple in that it uses two rep ranges—nine reps per set and five reps per set. This is great for those who like to keep rep ranges fairly constant. However, training weights do change each week over the 15-week program while the reps are kept constant throughout each of the two phases. As the weight increases, the number of sets decreases and rest between sets increases. See table 10.5 for the specifics of the 9 to 5 cycle. Weight increments are small, similar to the small-step cycle, but this one stops at 85 percent and doesn't go higher. Many believe that going much higher isn't necessary for building maximal strength.

Table 10.5 Getting Strong 9 to 5

Week	Sets	Reps	Weight (% RM)	Rest (minutes)
PHASE 1: 9 REPS				
1*	8	9	50%	2
2	8	9	53%	2
3	8	9	55%	2
4	7	9	57%	2
5*	7	9	60%	2
6	7	9	62%	2
7	6	9	65%	3
8	6	9	67%	3
9*	6	9	70%	3
10	5	9	73%	3
PHASE 2: 5 REPS				
11	5	5	75%	4
12*	4	5	77%	4
13	4	5	80%	4
14	3	5	82%	4
15	3	5	85%	4
16*	1RM test			

*1RM test week.

One-Year-Plus Intermediate Program

If you are an intermediate lifter you should consider following the previous cycles in the order presented—starting with the small-step cycle, following with the countdown cycle, and finishing with the 9 to 5 cycle. This will carry you through over 55 weeks—just over a solid year—of well-planned strength training. With the conclusion of this year plan you will be ready to progress into more advanced training cycles. One great advanced training cycle to follow the 9 to 5 cycle that concludes the year of intermediate training cycles is the 85-plus strength cycle found in the advanced training cycles section that follows. See table 10.6 for a sample training cycle progression that puts you in the rank of advanced weightlifter.

Table 10.6 Strength Calendar

Weeks	Cycle	Notes
1-20	Small-step cycle	
21	Active rest	Stay out of gym but take up other activities
22-43	Countdown cycle	
44	Active rest	Stay out of gym but take up other activities
45-60	9 to 5 cycle	
61	Active rest	Stay out of gym but take up other activities
62-	85-plus strength	

ADVANCED STRENGTH TRAINING CYCLES

The cycles that follow are advanced in the sense that they require greater skill and training experience in order to be used safely and properly. These programs are considered advanced for several reasons—they may start off at a heavier weight or they may require the use of advanced techniques. This does not imply that the training cycles covered in the basic strength training cycles are not useful for advanced weightlifters. Those programs may be basic in their progression; however, many elite competitive powerlifters use them. These advanced programs are designed for the advanced trainer who has a more difficult time continuing to make large strength gains, since basic programs may not always do the trick.

85-Plus Strength Cycle

Unlike the intermediate programs, which all start with very light weight in the 50 to 60 percent RM range, this program starts off at 85 percent RM and progressively builds up to 95 percent RM. This is depicted in table 10.7. It also increases the reps as time progresses with each percent RM. This is good for more advanced trainers or as a second leg to a previous program that started with a lighter phase. The 9 to 5 cycle, for instance, is a good cycle to use before this cycle. Another advanced technique that this cycle uses is negative-rep training. However, instead of doing it at the beginning of the working sets for bench press and squat, you would do these as the final working set for each major lift on working days.

Six-Phase Advanced Cycle

For some advanced weightlifters, strength gains no longer come easily. After all, the longer you train, the stronger you get; the stronger you get, the harder it is to get stronger. This is because trained lifters with greater strength are close to reaching the height of their genetic strength ceiling. This advanced program is designed to encourage strength gains in even the most seasoned lifter. In each of the six phases, the cycle uses an advanced training technique to encourage strength gains. The constant cycling of weight and reps, along with the specialized training techniques, prevents stagnation and promotes continual strength gains throughout the eight-month cycle.

This cycle uses a squat–bench press–deadlift training split that is meshed with a push–pull training split. That is, the workouts are divided into three separate workouts—squat, bench press, and deadlift with upper-body pushing exercises (shoulders and triceps exercises) done with the bench press day and the upper-body pulling exercises (back and biceps exercises) done with the deadlift day. For variety, each phase alters the order of the training split.

During the first phase (weeks 1 to 5), the training technique used is density training. This will increase the amount of weight you can perform 10

Table 10.7 85-Plus Strength

Day	Exercise	Sets	Reps	Weight (% RM)
		WEEK 1*		
1	Squat	5	3	85%
		1	3	120% (negative set)
	Leg press	3	3	
	Leg extension	3	3	
	Bench press	5	2	80%
	Standing calf raise	3	6	
3	Bench press	5	3	85%
		1	3	120% (negative set)
	Dumbbell bench press	3	3	
	Squat	5	2	80%
	Barbell shoulder press	3	3	
	Close-grip bench press	3	3	
5	Deadlift	5	3	85%
	Good morning	3	3	
	Lying leg curl	3	3	
	Standing crunch	3	6	
		WEEK 2		
8	Squat	5	4	85%
		1	3	120% (negative set)
	Leg press	3	4	
	Leg extension	3	4	
	Bench press	5	2	80%
	Standing calf raise	3	8	
10	Bench press	5	4	85%
		1	3	120% (negative set)
	Dumbbell bench press	3	4	
	Squat	5	2	80%
	Barbell shoulder press	3	4	
	Close-grip bench press	3	4	
12	Deadlift	5	4	85%
	Good morning	3	4	
	Lying leg curl	3	4	
	Standing crunch	3	8	
		WEEK 3		
15	Squat	5	5	85%
		1	3	120% (negative set)
	Leg press	3	5	
	Leg extension	3	5	
	Bench press	5	2	80%
	Standing calf raise	3	10	

(continued)

85-Plus Strength *(continued)*

Day	Exercise	Sets	Reps	Weight (% RM)
	WEEK 3			
17	Bench press	5	5	85%
		1	3	120% (negative set)
	Dumbbell bench press	3	5	
	Squat	5	2	80%
	Barbell shoulder press	3	5	
	Close-grip bench press	3	5	
19	Deadlift	5	5	85%
	Good morning	3	5	
	Lying leg curl	3	5	
	Standing crunch	3	10	
	WEEK 4			
22	Squat	5	6	85%
		1	3	120% (negative set)
	Leg press	3	6	
	Leg extension	3	6	
	Bench press	5	2	80%
	Standing calf raise	3	12	
24	Bench press	5	6	85%
		1	3	120% (negative set)
	Dumbbell bench press	3	6	
	Squat	5	2	80%
	Barbell shoulder press	3	6	
	Close-grip bench press	3	6	
26	Deadlift	5	6	85%
	Good morning	3	6	
	Lying leg curl	3	6	
	Standing crunch	3	12	
	WEEK 5*			
29	Squat	3	2	90%
		1	3	120% (negative set)
	Leg press	3	3	
	Leg extension	3	3	
	Bench press	5	2	80%
	Standing calf raise	3	6	
31	Bench press	3	2	90%
		1	3	120% (negative set)
	Dumbbell bench press	3	3	
	Squat	5	2	80%
	Barbell shoulder press	3	3	
	Close-grip bench press	3	3	
33	Deadlift	3	2	90%
	Good morning	3	3	
	Lying leg curl	3	3	
	Standing crunch	3	6	

	WEEK 6			
36	Squat	3	3	90%
		1	3	120% (negative set)
	Leg press	3	3	
	Leg extension	3	3	
	Bench press	5	2	80%
	Standing calf raise	3	6	
38	Bench press	3	3	90%
		1	3	120% (negative set)
	Dumbbell bench press	3	3	
	Squat	5	2	80%
	Barbell shoulder press	3	3	
	Close-grip bench press	3	3	
40	Deadlift	3	3	90%
	Good morning	3	3	
	Lying leg curl	3	3	
	Standing crunch	3	6	
	WEEK 7			
43	Squat	3	4	90%
		1	3	120% (negative set)
	Leg press	3	4	
	Leg extension	3	4	
	Bench press	5	2	80%
	Standing calf raise	3	8	
45	Bench press	3	4	90%
		1	3	120% (negative set)
	Dumbbell bench press	3	3	
	Squat	5	2	80%
	Barbell shoulder press	3	4	
	Close-grip bench press	3	4	
47	Deadlift	3	4	90%
	Good morning	3	4	
	Lying leg curl	3	4	
	Standing crunch	3	8	
	WEEK 8			
No assistance exercises are performed from here out, just the major lifts.				
50	Squat	3	2	95%
		1	3	120% (negative set)
	Bench press	5	2	80%
52	Bench press	3	2	95%
		1	3	120% (negative set)
	Squat	5	2	80%
54	Deadlift	3	2	95%
	WEEK 9*			
62	Squat	1	1	100%
	Bench press	1	1	100%
	Deadlift	1	1	100%

*Test 1RM.

reps with on the squat, bench press, and deadlift. This will carry over into greater strength on the 1RM for each of these lifts as well. This will be apparent when you test your 1RM in week 6. That is the only gym workout you will do in week 6.

In phase 2 (weeks 7 to 9), the training days are reorganized so that the deadlift day is first and the squat day is last. The bench press workout still is left in the middle to separate the two workouts that both use lower-body muscles to allow for better recovery. You will do working sets with 80 percent RM—however, this will be heavier than you could previously lift because of the boost in strength from the density training. The technique for this phase is forced-rep training. This is a mass-training technique covered in chapter 6. The reason it is included here in a strength cycle is to encourage some growth in muscle fibers—which can lend itself to greater force production and therefore muscle strength. In addition, the procedure of forcing extra reps can lead to direct increases in muscle strength. This phase lasts just three weeks because of the high intensity of the forced-rep training.

Phase 3 (weeks 11 to 17) starts off using about 80 to 85 percent RM or a weight you can do for four sets of six reps. This will kick off the 5 percent method that will carry this phase through the next seven weeks. Use the 5 percent method for each major lift and one assistance exercise that mimics the lift. In phase 4 (weeks 19 to 22) you will use a static contraction technique that calls on potentiation to enhance muscle strength on the second set. You will do working sets with 90 percent RM. Phase 5 (weeks 24 to 27) uses another potentiation technique known to boost your power on the three lifts. For each strength exercise (squat, deadlift, and bench press), you will perform one rep with 95 percent of your 1RM weight as quickly as possible. Rest for three minutes and downshift to 50 percent of your 1RM weight and perform five reps as explosively as possible. Repeat this three times to develop explosive strength. The final phase is yet another potentiation program. This is basically the reverse of the technique of the previous phase because it uses explosive movements to enhance maximal strength. At the climax of this program your 1RM on all three moves will be dramatically enhanced. Follow this final phase with one or two weeks of active rest before starting the cycle over or moving on to a new strength training cycle.

Table 10.8 Advanced Six

PHASE 1: WEEKS 1-5				
WORKOUT 1: SQUAT				
Exercise	**Sets**	**Reps**	**%1RM**	**Notes**
Squat	10	2 (week 1)	80%	Follow the density training method found in chapter 9 for a goal of 10 reps.
	6	3 (week 2)		
	5	4 (week 3)		
	4	5 (week 4)		
	3	6 (week 5)		
Leg press	3	10		
Leg extension	3	10		
Leg curl	3	10		
Standing calf raise	4	20		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	10	2 (week 1)	80%	Follow the density training method found in chapter 9 for a goal of 10 reps.
	6	3 (week 2)		
	5	4 (week 3)		
	4	5 (week 4)		
	3	6 (week 5)		
Incline dumbbell press	2	10		Perform the last set of each exercise to muscle failure.
Flat dumbbell press	2	10		
Barbell shoulder press	3	10		
Lying triceps extensions	3	10		
Hanging leg raise	4	12-15		

WORKOUT 3: DEADLIFT AND PULL				
Exercise	**Sets**	**Reps**	**% 1RM**	**Notes**
Deadlift	10	2 (week 1)	80%	Follow the density training method found in chapter 9 for a goal of 10 reps.
	6	3 (week 2)		
	5	4 (week 3)		
	4	5 (week 4)		
	3	6 (week 5)		
Barbell row	2	10		Perform the last set of each exercise to muscle failure.
Lat pulldown	2	10		
Barbell curl	3	10		
Standing cable crunch	3	12		
WEEK 6				
WORKOUT 1: PERFORM MID- TO LATE WEEK				
Test your 1RM on the squat, bench press, and deadlift in that order.				
PHASE 2: WEEKS 7-9				
WORKOUT 1: DEADLIFT AND PULL				
Deadlift	5	8	80%	For the last set of each exercise, perform forced reps where you perform 2 or 3 reps with the assistance of a spotter or a training partner after you reach failure. The exception is ab exercises.
Pull-up	3	8		
Barbell row	3	8		
Barbell curl	3	8		
Reverse crunch	3	12-15		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	5	8	80%	
Incline dumbbell press	3	8		
Dumbbell shoulder press	2	8		
Lateral raise	2	8		
Seated overhead triceps extension	2	8		
Dip	3	8		
Cable crunch	3	12-15		
WORKOUT 3: SQUAT				
Squat	5	8	80%	
Leg press	2	8		
Leg extension	2	8		
Leg curl	2	8		
Leg press calf raise	3	15-20		
WEEK 10				
WORKOUT 1: PERFORM MID- TO LATE WEEK				
Test your 1RM on the squat, bench press, and deadlift in that order.				
PHASE 3: WEEKS 11-17				
WORKOUT 1: SQUAT (WEEK 11)				
Squat	4	6	~80-85%	
Leg press	4	6	~80-85%	
Leg extension	3	6		
Leg curl	3	6		
Standing calf raise	3	15-20		

(continued)

Advanced Six *(continued)*

Exercise	Sets	Reps	% 1RM	Notes
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	6	~80-85%	
Incline bench press	4	6	~80-85%	
Barbell shoulder press	3	6		
Close-grip bench press	3	6		
Weighted crunch	3	12-15		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	6	~80-85%	
Romanian deadlift	4	6	~80-85%	
Barbell row	3	6		
Barbell curl	3	6		
Reverse crunch	3	12-15		
WORKOUT 1: SQUAT (WEEK 12)				
Squat	4	5	~80-85% + 5%	
Leg press	4	5	~80-85% + 5%	
Leg extension	3	5		
Leg curl	3	5		
Standing calf raise	3	15-20		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	5	~80-85% + 5%	
Incline bench press	4	5	~80-85% + 5%	
Barbell shoulder press	3	5		
Close-grip bench press	3	5		
Weighted crunch	3	12-15		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	5	~80-85% + 5%	
Romanian deadlift	4	5	~80-85% + 5%	
Barbell row	3	5		
Barbell curl	3	5		
Reverse crunch	3	12-15		
WORKOUT 1: SQUAT (WEEK 13)				
Squat	4	4	~80-85% + 10%	
Leg press	4	4	~80-85% + 10%	
Leg extension	3	4		
Leg curl	3	4		
Seated calf raise	3	20		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	4	~80-85% + 10%	
Incline bench press	4	4	~80-85% + 10%	
Barbell shoulder press	3	4		
Close-grip bench press	3	4		
Cable crunch	3	10		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	4	~80-85% + 10%	
Romanian deadlift	4	4	~80-85% + 10%	

Exercise	Sets	Reps	% 1RM	Notes
Barbell row	3	4		
Barbell curl	3	4		
Russian twist	3	12-15		
WORKOUT 1: SQUAT (WEEK 14)				
Squat	4	6	~80-85% + 5%	
Leg press	4	6	~80-85% + 5%	
Leg extension	3	6		
Leg curl	3	6		
Seated calf raise	3	25		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	6	~80-85% + 5%	
Incline bench press	4	6	~80-85% + 5%	
Barbell shoulder press	3	6		
Close-grip bench press	3	6		
Cable crunch	3	12		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	6	~80-85% + 5%	
Romanian deadlift	4	6	~80-85% + 5%	
Barbell row	3	6		
Barbell curl	3	6		
Russian twist	3	12-15		
WORKOUT 1: SQUAT (WEEK 15)				
Squat	4	5	~80-85% + 10%	
Leg press	4	5	~80-85% + 10%	
Leg extension	3	5		
Leg curl	3	5		
Leg press calf raise	3	12		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	5	~80-85% + 10%	
Incline bench press	4	5	~80-85% + 10%	
Barbell shoulder press	3	5		
Close-grip bench press	3	5		
Cable crunch	3	15		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	5	~80-85% + 10%	
Romanian deadlift	4	5	~80-85% + 10%	
Barbell row	3	5		
Barbell curl	3	5		
Dumbbell woodchopper	3	12-15		
WORKOUT 1: SQUAT (WEEK 16)				
Squat	4	4	~80-85% + 15%	
Leg press	4	4	~80-85% + 15%	
Leg extension	3	4		
Leg curl	3	4		
Seated calf raise	3	25		

(continued)

Advanced Six *(continued)*

Exercise	Sets	Reps	% 1RM	Notes
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	4	~80-85% + 15%	
Incline bench press	4	4	~80-85% + 15%	
Barbell shoulder press	3	4		
Close-grip bench press	3	4		
Cable crunch	3	12		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	4	~80-85% + 15%	
Romanian deadlift	4	4	~80-85% + 15%	
Barbell row	3	4		
Barbell curl	3	4		
Russian twist	3	12-15		
WORKOUT 1: SQUAT (WEEK 17)				
Squat	4	6	~80-85% + 10%	
Leg press	4	6	~80-85% + 10%	
Leg extension	3	6		
Leg curl	3	6		
Standing calf raise	3	15-20		
WORKOUT 2: BENCH PRESS AND PUSH				
Bench press	4	6	~80-85% + 10%	
Incline bench press	4	6	~80-85% + 10%	
Barbell shoulder press	3	6		
Close-grip bench press	3	6		
Weighted crunch	3	12-15		
WORKOUT 3: DEADLIFT AND PULL				
Deadlift	4	6	~80-85% + 10%	
Romanian deadlift	4	6	~80-85% + 10%	
Barbell row	3	6		
Barbell curl	3	6		
Reverse crunch	3	12-15		
WEEK 18				
WORKOUT 1: PERFORM MID- TO LATE WEEK				
Test your 1RM on the squat, bench press, and deadlift in that order.				
PHASE 4: WEEKS 19-22				
WORKOUT 1: DEADLIFT AND PULL				
Static-drive deadlift	3	3	120% +	Alternate between static-drive deadlifts and regular heavy deadlifts, resting 30 seconds after static-drive deadlifts and resting 3 minutes after heavy deadlifts. Complete 3 sets of each deadlift and rest for 1 minute before continuing with the remaining exercises.
Alternated with heavy deadlift	3	4	90%	
Pull-up	3	6-8		
Barbell row	3	3-4		
Barbell curl	3	3-4		
Preacher curl	3	3-4		
Reverse crunch	3	12-15		

WORKOUT 2: BENCH PRESS AND PUSH				
Exercise	**Sets**	**Reps**	**% 1RM**	**Notes**
Static-drive bench press	3	3	120% +	Alternate between static-drive bench presses and regular heavy bench presses, resting 30 seconds after static-drive bench presses and resting 3 minutes after heavy bench presses. Complete 3 sets of each bench press and rest for 1 minute before continuing with the remaining exercises.
Alternated with heavy bench press	3	4	90%	
Incline dumbbell press	3	3-4		
Dumbbell shoulder press	3	3-4		
Dip	3	3-4		Add weight as needed to reach failure in the 3- to 4-rep range.
Cable crunch	3	8-10		
WORKOUT 3: SQUAT				
Static-drive squat	3	3	120% +	Alternate between static-drive squats and regular heavy squats, resting 30 seconds after static-drive squats and resting 3 minutes after heavy squats. Complete 3 sets of each squat and rest for 1 minute before continuing with the remaining exercises.
Alternated with heavy squat	3	4	90%	
Leg press	3	3-4		
Leg extension	3	6-8		Add weight as needed to reach failure in the 6- to 8-rep range.
Leg curl	3	6-8		
Leg-press calf raise	3	12-15		
WEEK 23				
WORKOUT 1: PERFORM MID- TO LATE WEEK				
Test your 1RM on the squat, bench press, and deadlift in that order.				
PHASE 5: WEEKS 24-27				
WORKOUT 1: SQUAT				
Squat	3	1	95%	After a thorough warm-up, do the first set with 1 rep (no more or you will fatigue the muscle) with 95% of your 1RM weight. Rest for 3 minutes and then do the next set with 3 to 5 reps with 50% of your 1RM weight. Alternate between the weights 3 times for a total of 6 sets.
	3	5	50%	
Leg press	3	5	50%	
Leg extension	3	5	50%	
Leg curl	3	5	50%	
Leg press calf raise	3	5	50%	
WORKOUT 2: BENCH PRESS				
Bench press	3	1	95%	After a thorough warm-up, do the first set with 1 rep (no more or you will fatigue the muscle) with 95% of your 1RM weight. Rest for 3 minutes and then do the next set with 3 to 5 reps with 50% of your 1RM weight. Alternate between the weights 3 times for a total of 6 sets.
	3	5	50%	

(continued)

Advanced Six *(continued)*

Exercise	Sets	Reps	% 1RM	Notes
Dumbbell bench press	3	5	50%	
Barbell shoulder press	3	5	50%	
Dumbbell upright rows	3	5	50%	
Close-grip bench press	3	5	50%	
Hanging leg raise	3	12-15		
WORKOUT 3: DEADLIFT				
Deadlift	3	1	95%	After a thorough warm-up, do the first set with 1 rep (no more or you will fatigue the muscle) with 95% of your 1RM weight. Rest for 3 minutes and then do the next set with 3 to 5 reps with 50% of your 1RM weight. Alternate between the weights 3 times for a total of 6 sets.
	3	5	50%	
Pulldown	3	5	50%	
Barbell row	3	5	50%	
Barbell curl	3	5	50%	
Reverse crunch	3	12-15		
WEEK 28				
WORKOUT 1: PERFORM MID- TO LATE WEEK				
Test your 1RM on the squat, bench press, and deadlift in that order.				
PHASE 6: WEEKS 29-32				
WORKOUT 1: DEADLIFT				
Exercise	**Sets**	**Reps**	**% 1RM**	**Notes**
Dumbbell deadlift jump	3	3	30%	
Alternated with deadlift	3	2-3	95%	
Barbell row	3	2-3	95%	
Barbell curl	3	2-3	95%	
Standing cable crunch	3	6-8		
WORKOUT 2: BENCH PRESS				
Power push-up	3	3	Body weight	
Alternated with bench press	3	2-3	95%	
Barbell incline press	3	2	95%	
Barbell shoulder press	3	2	95%	
Close-grip bench press	3	2	95%	
Hanging leg raise	3	15-20		
WORKOUT 3: SQUAT				
Barbell squat jump	3	3	30%	
Alternated with squat	3	2-3	95%	
Leg press	3	2	95%	
Standing calf raise	3	2	95%	
WEEK 33				
WORKOUT 1: PERFORM MID- TO LATE WEEK				
Test your 1RM on the squat, bench press, and deadlift in that order.				

LIFT-SPECIFIC CYCLES

Training to build overall strength should be every weightlifter's major goal. However, after you have a strong base of overall strength from lifting for a good while, you may want to build up strength in certain lifts. This may be due to an imbalance of strength in a certain area. Or you may just have an affinity for a particular lift and want to excel at it. This is often common with the bench press. The following programs are designed to build up your strength in one lift and only one lift. However, this does not mean that you shouldn't work on increasing your strength in the other lifts. These programs emphasize the bench press, squat, or deadlift. However, they are designed to fit in with regular training splits. One way to use these cycles is to alternate the three of them so that you emphasize bench press strength at one phase in your training cycle, squat strength in another, and deadlift strength in another before cycling back to bench press–focused training.

Bench Press Booster Cycle

This 10-week cycle involves using an upper- and lower-body split so that you can train chest twice each week (once on Monday with a heavy day and once on Thursday with a light day of bench press work). On the heavy chest day, all you do is bench press. Weight increases and therefore repetitions decrease every three weeks until you reach the last week, where you max out with your new record weight. Allow three to five minutes of rest between sets on your heavy bench day to keep your strength up. On the light chest day you do the bench press along with the other upper-body assistance exercises. In this workout, you'll perform light bench presses as well as dumbbell bench presses (incline or flat) and flys (incline or flat). Rotate the incline and flat version of these exercises so that when you do incline dumbbell presses, you follow with flat flys and vice versa. Allow two to three minutes of rest between sets on the light chest day.

Finish the chest workout with power push-ups to develop explosive power that will help you throw up more weight on the bench press. This light day is important because it keeps the muscle from losing its memory of how strong it was at the previous training session, enhances the blood circulation in the areas that are important to the bench, keeps your muscle size up, and reinforces your groove—that unique lifting path that you'll discover to be the best way to push the bar up to completion. Follow the light chest routine with one exercise for shoulders, back, triceps, and biceps.

Follow this routine for 9 weeks. On the 10th week, you max out on your specified heavy chest day. You'll be amazed at your newfound strength. Do no other lifting this week; you should be at your peak. After you peak, take a period of active recovery in which you perform some form of light exercise. Try other activities that involve both upper- and lower-body movements such as swimming, racket sports, or rock-wall climbing.

Table 10.9 Big Bench Routine

MONDAY: HEAVY BENCH PRESS DAY			
Exercise	Sets	Reps	Weight (% RM)
Bench press	1	10	50%
	1	6	60%
	1	4	70%
Weeks 1-3	4	6	85%
Weeks 4-6	4	4	90%
Weeks 7-9	4	2	95%
Week 10	3	Muscle failure	60%
THURSDAY: LIGHT BENCH PRESS DAY			
Bench press	1	10	50%
	1	6	60%
	3	4	75%
	1	8	55%
Dumbbell bench press	2	10	70%
Incline dumbbell fly	2	10	70%
Power push-up	3	Failure	Body weight
Barbell overhead press	3	6	80%
Barbell row	3	6	80%
Close-grip bench press	3	6	80%
Barbell curl	3	6	80%

Squat-Building Cycle

This six-week squat program is a modified version of what is known as the Russian squat routine. It will increase your squat weight 5 to 10 percent

in just six weeks. However, it does require you to squat for three days per week (see table 10.10). That makes the squat–bench press–deadlift training split the best split to use with this program, but with one modification: You will squat first on all three workout days. On Monday do a full squat workout with just two extra assistance exercises for quads (the leg press and leg extension) as well as one calf exercise. On Wednesday you will perform just the prescribed number of squats and no other leg work before your bench press workout. On Friday you will do the same thing before your deadlift workout. Some lifters opt to train their squats in the morning on Wednesdays and Fridays and their bench presses and deadlifts in the evening. This can help prevent the fatigue that may hinder your other lifts after performing several sets of squats.

The program starts at 80 percent RM and cycles over the 18-day program to reach 100 percent by the 16th workout. Then it drops back to 80 percent for the 17th workout to give the legs a rest before the 18th workout, where you will test your 1RM with at least 105 percent of your original 1RM before this program.

Table 10.10 Russian Squat Strength

Before each workout, do several warm-up sets to get up to working set weight.

WEEK 1

MONDAY: SQUAT WORKOUT DAY

Exercise	Sets	Reps	Weight (% RM)
Squat	6	2	80%
Leg press	3	6	
Leg extension	3	6	
Standing calf raise	3	10	
WEDNESDAY: BENCH PRESS WORKOUT DAY			
Squat	6	3	80%
Bench press workout (immediately following squats or later in day)			
FRIDAY: DEADLIFT WORKOUT DAY			
Squat	6	2	80%
Deadlift workout (immediately following squats or later in day)			

WEEK 2

MONDAY: SQUAT WORKOUT DAY

Exercise	Sets	Reps	Weight (% RM)
Squat	6	4	80%
Leg press	3	6	
Leg extension	3	6	
Standing calf raise	3	10	
WEDNESDAY: BENCH PRESS WORKOUT DAY			
Squat	6	2	80%
Bench press workout (immediately following squats or later in day)			
FRIDAY: DEADLIFT WORKOUT DAY			
Squat	6	5	80%
Deadlift workout (immediately following squats or later in day)			

WEEK 3

MONDAY: SQUAT WORKOUT DAY

Exercise	Sets	Reps	Weight (% RM)
Squat	6	2	80%
Leg press	3	6	
Leg extension	3	6	
Standing calf raise	3	10	
WEDNESDAY: BENCH PRESS WORKOUT DAY			
Squat	6	6	80%
Bench press workout (immediately following squats or later in day)			
FRIDAY: DEADLIFT WORKOUT DAY			
Squat	6	2	80%
Deadlift workout (immediately following squats or later in day)			

WEEK 4

MONDAY: SQUAT WORKOUT DAY

Exercise	Sets	Reps	Weight (% RM)
Squat	5	5	85%
Leg press	3	6	
Leg extension	3	6	
Standing calf raise	3	10	
WEDNESDAY: BENCH PRESS WORKOUT DAY			
Squat	6	2	80%
Bench press workout (immediately following squats or later in day)			
FRIDAY: DEADLIFT WORKOUT DAY			
Squat	4	4	90%
Deadlift workout (immediately following squats or later in day)			

WEEK 5			
MONDAY: SQUAT WORKOUT DAY			
Exercise	Sets	Reps	Weight (% RM)
Squat	6	2	80%
Leg press	3	6	
Leg extension	3	6	
Standing calf raise	3	10	
WEDNESDAY: BENCH PRESS WORKOUT DAY			
Squat	3	3	95%
Bench press workout (immediately following squats or later in day)			
FRIDAY: DEADLIFT WORKOUT DAY			
Squat	6	2	80%
Deadlift workout (immediately following squats or later in day)			

WEEK 6			
MONDAY: SQUAT WORKOUT DAY			
Exercise	Sets	Reps	Weight (% RM)
Squat	2	2	100%
Leg press	3	6	
Leg extension	3	6	
Standing calf raise	3	10	
WEDNESDAY: BENCH PRESS WORKOUT DAY			
Squat	6	2	80%
Bench press workout (immediately following squats or later in day)			
FRIDAY: DEADLIFT WORKOUT DAY			
No squats, just deadlift workout			
WEEK 7			
Test new 1RM.			

Deadlift Raising Cycle

This 10-week program is effective for boosting strength in the deadlift in even the most experienced lifters. In fact, this program is similar to one used by many elite deadlifters, including Mark Phillipi. This program works well with a squat–bench press–deadlift training split, as long as you do the deadlift workout first in the week and the squat workout last (see table 10.11). It consistently uses just one set of heavy weight for very low reps (one or two) as the first working set of each workout. Over the 10 weeks the weight for this set moves from 75 percent to 100 percent. Following the heavy set are several sets of light deadlifts done explosively. This builds up the power you will need to explode the weight off the floor at the start of the deadlift. The first four weeks use a circuit program for the assistance exercises. This helps to condition the muscles to prevent fatigue. The last six weeks use straight sets for all assistance exercises.

Table 10.11 Raising the Dead

Before each workout, do several warm-up sets to get up to working-set weight. Do the assistance circuit in a circuit format—rest 90 seconds between each exercise and rest 3 minutes between the end of the circuit and beginning the circuit again. Do three circuits, totaling eight reps on each exercise.

WEEK 1				
Exercise	Sets	Reps	Weight (% RM)	Rest
Deadlift	1	2	75%	3 min
	8	3	60%	90 sec
ASSISTANCE CIRCUIT				
Romanian deadlift	3	8		90 sec
Barbell row	3	8		90 sec
Lat pulldown	3	8		90 sec
Good morning	3	8		90 sec
WEEK 2				
Deadlift	1	2	80%	3 min
	8	3	65%	90 sec
ASSISTANCE CIRCUIT				
Romanian deadlift	3	8		90 sec
Barbell row	3	8		90 sec
Lat pulldown	3	8		90 sec
Good morning	3	8		90 sec
WEEK 3				
Deadlift	1	2	85%	3 min
	6	3	70%	2 min
ASSISTANCE CIRCUIT				
Romanian deadlift	3	8		90 sec
Barbell row	3	8		90 sec
Lat pulldown	3	8		90 sec
Good morning	3	8		90 sec

(continued)

Raising the Dead *(continued)*

Exercise	Sets	Reps	Weight (% RM)	Rest
WEEK 4				
Deadlift	1	2	90%	3 min
	5	3	70%	2 min
ASSISTANCE CIRCUIT				
Romanian deadlift	3	8		90 sec
Barbell row	3	8		90 sec
Lat pulldown	3	8		90 sec
Good morning	3	8		90 sec
WEEK 5				
Deadlift	1	2	80%	3 min
	3	3	65%	2 min
Power shrug	3	5	60%	2 min
Romanian deadlift	3	5		2 min
Barbell row	3	5		2 min
Lat pulldown	3	5		2 min
Good morning	3	5		2 min
WEEK 6				
Deadlift	1	2	85%	3 min
	3	3	70%	2 min
Power shrug	3	5	65%	2 min
Romanian deadlift	3	5		2 min
Barbell row	3	5		2 min
Lat pulldown	3	5		2 min
Good morning	3	5		2 min
WEEK 7				
Deadlift	1	2	90%	3 min
	3	3	75%	2 min
Power shrug	2	5	70%	2 min
Romanian deadlift	2	5		2 min
Barbell row	2	5		2 min
Lat pulldown	2	5		2 min
Good morning	2	5		2 min
WEEK 8				
Deadlift	1	2	95%	3 min
	3	3	70%	2 min
Power shrug	2	5	75%	2 min
Romanian deadlift	2	5		2 min
Barbell row	2	5		2 min
Lat pulldown	2	5		2 min
Good morning	2	5		2 min
WEEK 9				
Deadlift	1	1	97.5%	3 min
	2	3	70%	2 min
Power shrug	2	5	75%	2 min
Romanian deadlift	2	5		2 min
WEEK 10				
Deadlift	1	1	100%	3 min
	2	3	60%	2 min
Power shrug	2	5	75%	2 min
Romanian deadlift	2	5		2 min
WEEK 11				
Test 1RM for deadlift.				

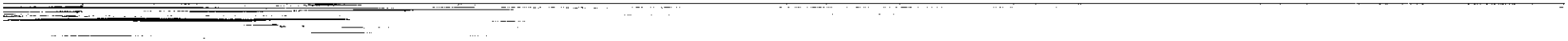
PART IV

Training Exercises

No matter how sound an exercise program is, it won't be effective without the proper execution of the exercises that make up that program. Contained in this section are the descriptions for proper form of every exercise covered in the previous chapters, in addition to many others not covered. This is a total of 255 exercises. Accompanying each exercise description is a photo of that exercise to help you visualize the proper execution of each exercise.

Each chapter covers the exercises that train one specific muscle group. These chapters organize the exercises into similar movements that train that muscle group in a similar manner. This is to encourage you to frequently substitute exercises in a program with other exercises that are similar in the effect they will have on a particular muscle. This not only will help to prevent stagnation of muscle adaptations and overall boredom but will also encourage the greatest gains in muscle growth and strength. This is because the slightest variation of an exercise can target different muscle fibers within a muscle group.

Regardless of your goals, having such an arsenal of exercises to choose from will help to maximize your results. Whatever program you are following, you can use this section to change the exercise selections. To do this for any exercise, simply choose from the list of exercises that accompany that exercise in the same category. For example, to find an alternative exercise for the bench press, just choose one of the other exercises from the barbell pressing exercises category, such as incline bench press, decline bench press, Smith machine flat bench press, Smith machine incline bench press, or Smith machine decline bench press. Just be sure to follow the guidelines discussed in chapters 5 and 8 for exercise selection and order. Making the slightest alterations to a program while staying within the suggested guidelines is the best way to individualize a program for best results.



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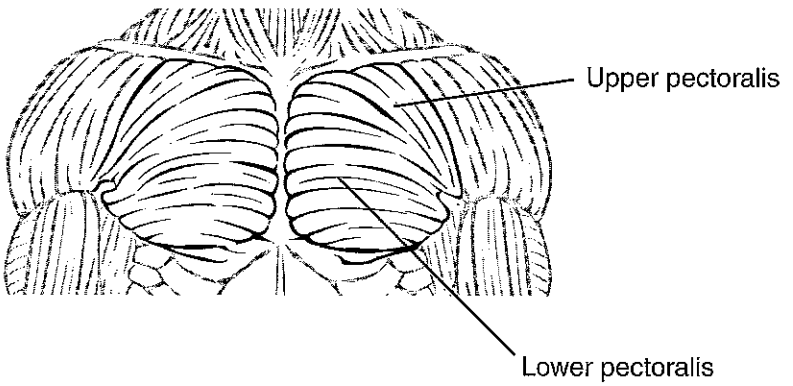
CHAPTER 11

Chest

This chapter contains detailed descriptions of all major exercises that focus on the chest (pectoral) muscles. The pectoralis muscles are divided into the upper and lower sections (see diagram). Although many of these exercises are pressing movements (such as the bench press) that are multijoint exercises, requiring the use of the deltoids and triceps as well as the pectorals, they are considered primarily chest exercises because of the movement of the upper arms. The chest exercises are divided into barbell pressing exercises, dumbbell pressing exercises, machine pressing exercises, fly-type exercises, and push-up and dip exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted (for example, if the incline bench press is called for, any barbell press exercise can be substituted).



Barbell Pressing Exercises

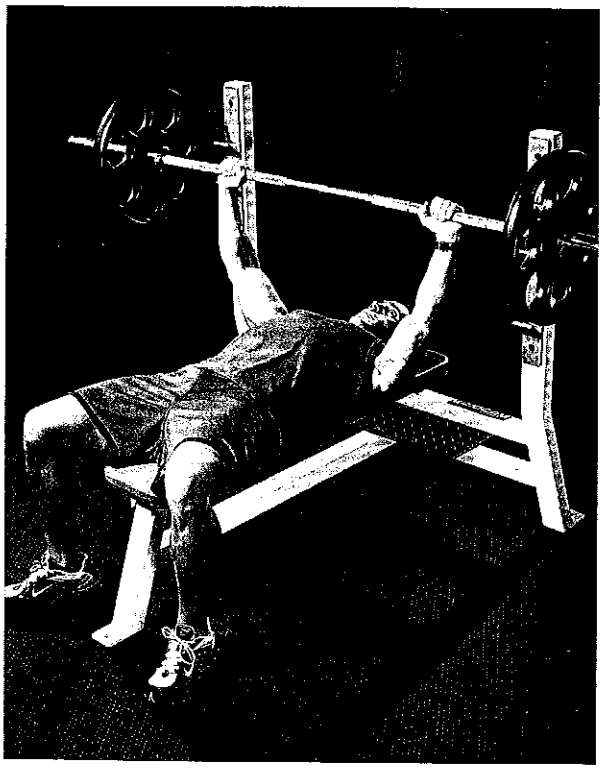
Dumbbell Pressing Exercises

Machine Pressing Exercises

Fly-Type Exercises

Push-Up, Dip, and Pullover Exercises

Bench Press



START

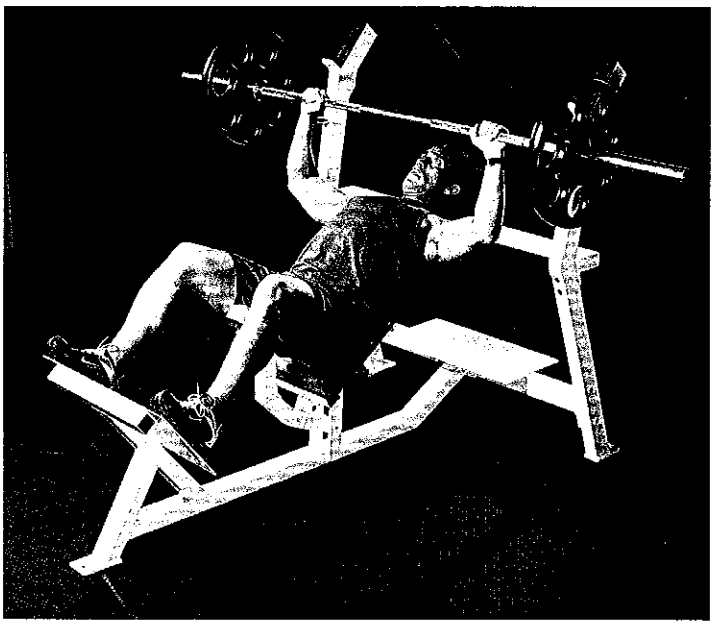
Lie faceup on a bench-press bench with your feet flat on the floor. Grasp the barbell with an overhand grip, hands slightly wider than shoulder-width apart.

MOVE

Unrack the bar and slowly lower it toward your chest. Keep your wrists aligned with your elbows and your elbows pointed out to your sides. When the bar just touches your chest, press back up explosively, driving the weight away from you until you almost lock it out.

Note: For details on performing the bench press to maximize strength, see chapter 8.

Incline Bench Press



START

Lie on an incline bench-press bench and grasp the racked barbell with a grip that's slightly wider than shoulder width, palms facing toward the ceiling. Lift the bar off the rack and raise it until your arms are fully extended.

MOVE

Bend your elbows to lower the bar to your upper chest. At the bottom, your elbows should be out and away from your body but slightly in front of your shoulders. Contract your chest muscles and extend your elbows to press the bar up until your elbows are almost locked out.

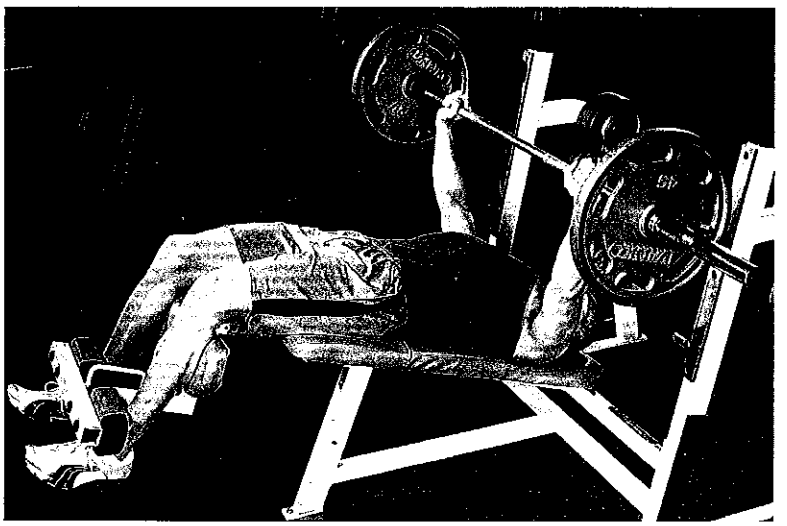
Decline Bench Press

START

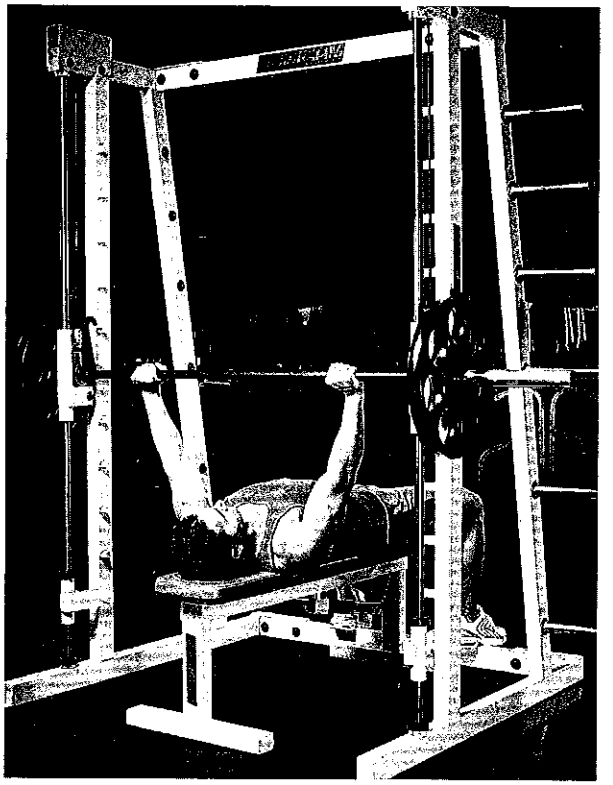
Lie back on a decline bench-press bench set to a 30- to 40-degree decline. Grasp the barbell with an overhand grip with both hands slightly wider than shoulder-width apart. Lift the bar off the supports and hold it over your lower chest with your arms extended.

MOVE

Lower the barbell to your lower chest. Immediately push the bar back up to full extension without locking your elbows out at the top.



Smith Machine Flat Bench Press



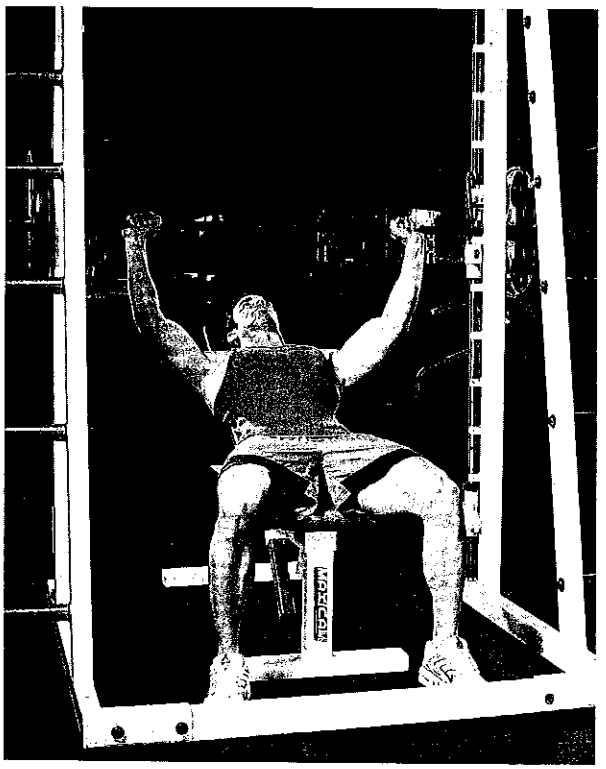
START

Position yourself on a flat bench that is positioned in a Smith machine so that the bar lines up with your lower chest (where your nipples are). Grasp the bar with an overhand grip spaced slightly wider than shoulder-width apart. Release the safety hooks.

MOVE

Lower the bar to your chest. Press the bar back up to full arm extension, stopping just short of elbow lockout. Pause at the top and lower the bar under control to your upper chest.

Smith Machine Incline Bench Press



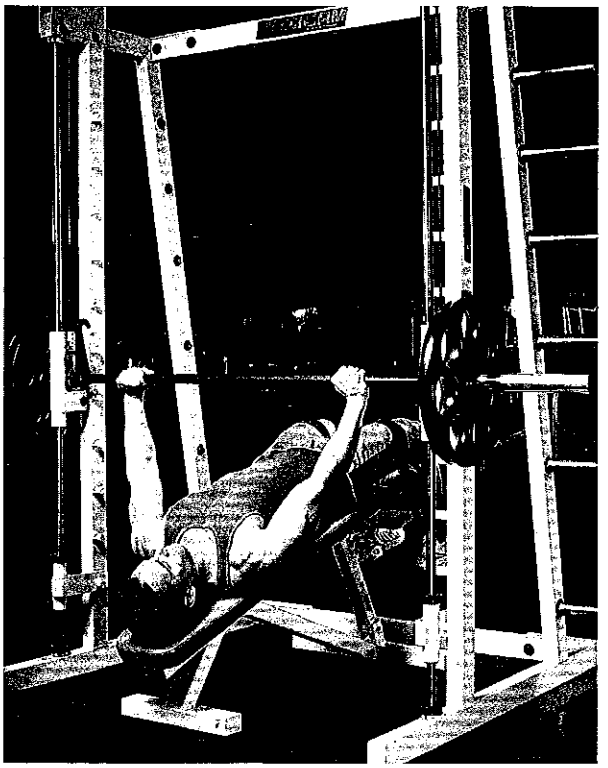
START

Position yourself on an incline bench (set to about 30 to 40 degrees) that is positioned in a Smith machine so that the bar lines up with the top of your chest. Grasp the bar with an overhand grip spaced slightly wider than shoulder-width apart. Release the safety hooks.

MOVE

Lower the bar to your chest. Press the bar up to full arm extension, stopping just short of elbow lockout.

Smith Machine Decline Bench Press



START

Position yourself on a decline bench (set to about 30 to 45 degrees) that is positioned in a Smith machine so that the bar lines up with the lower part of your chest. Grasp the bar with an overhand grip that is slightly wider than shoulder-width apart. Release the safety hooks.

MOVE

Lower the bar to your chest. Press the bar up to full arm extension, stopping just short of elbow lockout.

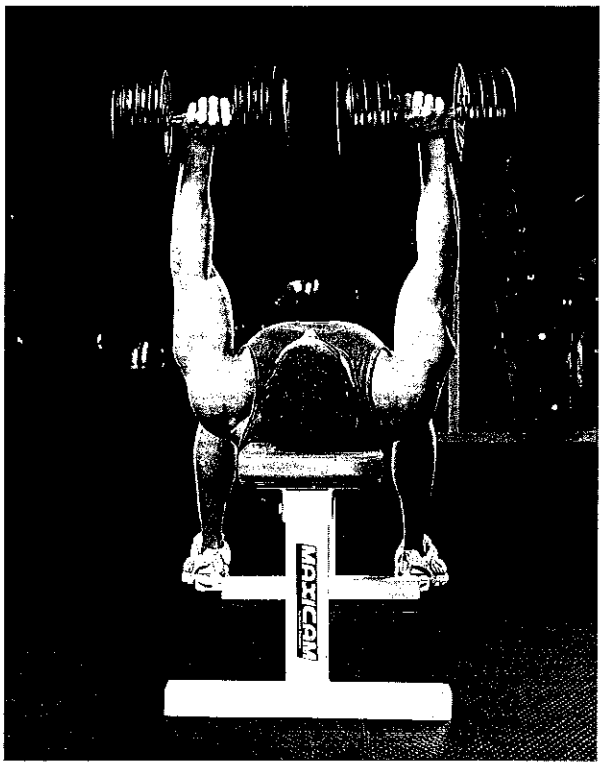
Dumbbell Bench Press

START

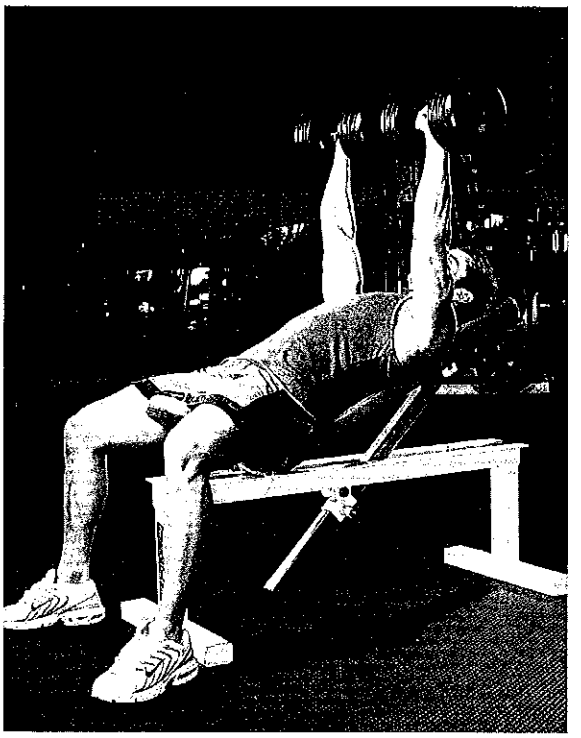
Lie faceup on a flat bench with your feet planted flat on the floor. Hold the dumbbells just outside your shoulders with your elbows out to your sides.

MOVE

Forcefully press the weights up in an arc (coming toward each other at the top) until your arms are fully extended above your chest. Reverse the motion, being sure not to lower the dumbbells below chest level.



Incline Dumbbell Press



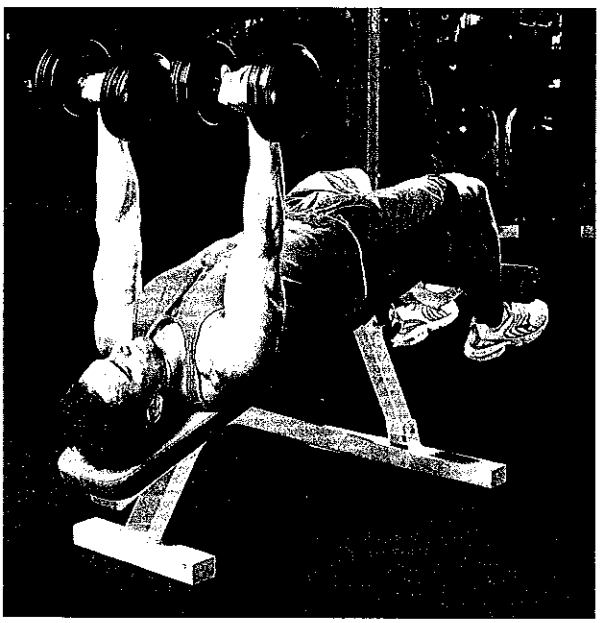
START

Lie squarely on an incline bench, which should be set at a fairly low angle. Hold the dumbbells just outside your shoulders with your elbows out to your sides and your feet planted flat on the floor.

MOVE

Forcefully press the weights up in an arc (coming toward each other at the top) until your arms are fully extended above your chest. Reverse the motion, being sure not to lower the dumbbells below chest level.

Decline Dumbbell Press



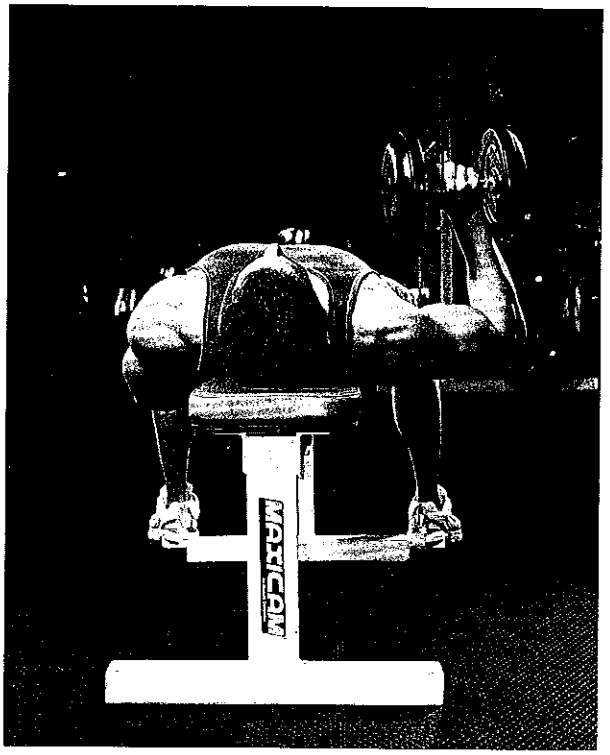
START

Lie back on a decline bench set to 30 to 40 degrees with your feet secured under the foot pads. Hold the dumbbells just outside your lower chest with your elbows out to your sides.

MOVE

Forcefully press the weights up in an arc (coming toward each other at the top) until your arms are fully extended above your lower chest or upper abs.

One-Arm Dumbbell Bench Press



START

Grasp a dumbbell and lie faceup on the bench. Hold the dumbbell just outside your shoulder with your elbow out to your sides. With your other arm, grasp the side of the bench down by your hip.

MOVE

Press the dumbbell up until your arm is fully extended above your chest. Reverse the motion, being sure not to lower the dumbbells below lower chest level. Complete the desired number of reps and repeat with your other arm.

Note: You can also do this exercise on the incline or decline bench in a similar manner.

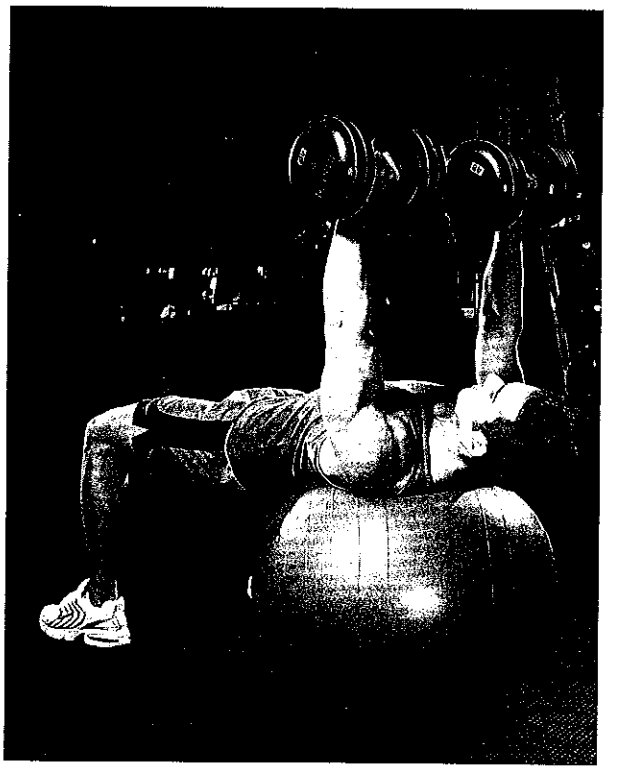
Exercise-Ball Dumbbell Press

START

Grasping two dumbbells, lie with your upper back on an exercise ball with your feet planted firmly on the floor. Hold the dumbbells just outside your shoulders with your palms facing forward and your elbows out to your sides.

MOVE

Forcefully press the weights up in an arc (coming toward each other at the top) until your arms are fully extended above your chest. Reverse the motion, being sure not to lower the dumbbells below chest level.



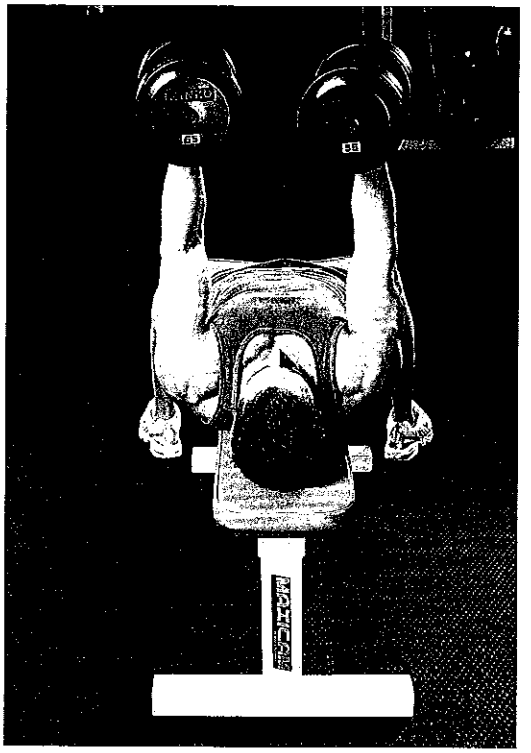
Neutral-Grip Flat Bench Dumbbell Press

START

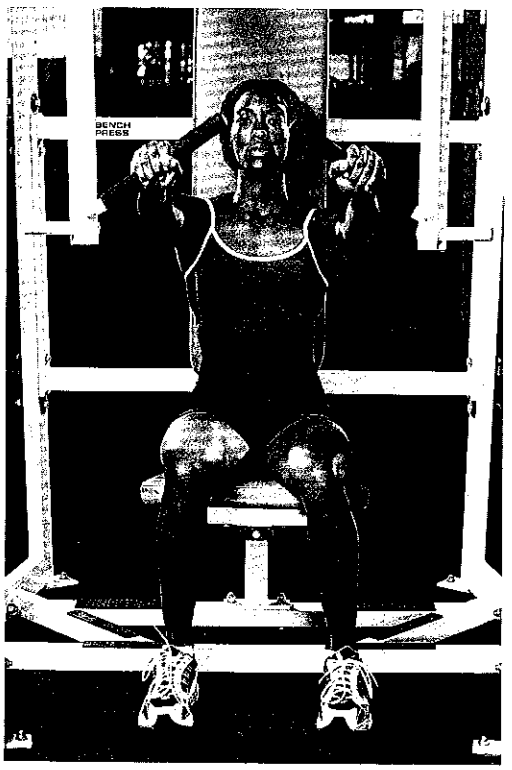
Grasping two dumbbells, lie on a flat bench and turn your wrists so that they are toward each other, hands at each side of your torso with the dumbbells above your body.

MOVE

Press the dumbbells upward, allowing them to naturally move toward each other at the top (without touching). Then reverse the move back to the starting position.



Seated Chest Press Machine



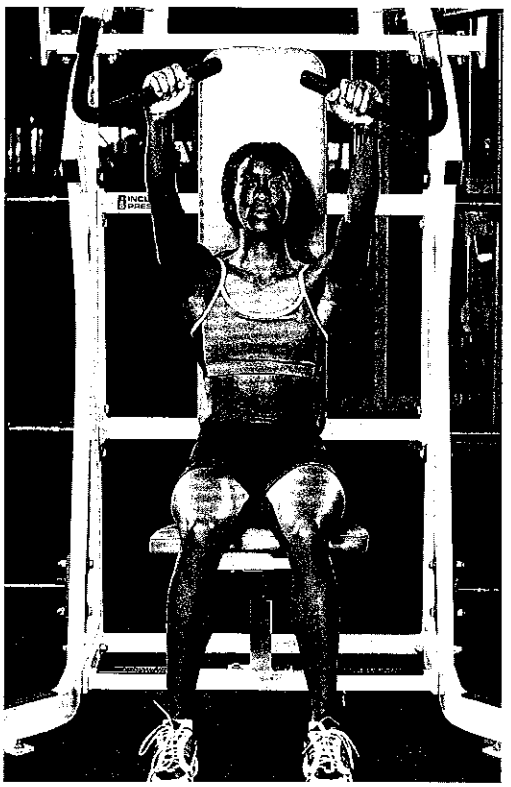
START

Position the handles of the machine so that they line up with your mid- to upper chest. Sit back in the seat and grab the handles with an overhand grip.

MOVE

Press the handles out in front of you until your arms are fully extended but not locked, then slowly bring the handles back toward your chest without letting the weights touch the stack.

Incline Press Machine



START

Adjust the machine so your back rests comfortably against the pad and your feet are flat on the floor. The handles should be aligned right at or just below shoulder level when you sit down.

MOVE

Press the handles away from you until your arms are fully extended without locking out your elbows at the top. Slowly bring the handles back toward your chest without letting the weights touch the stack.

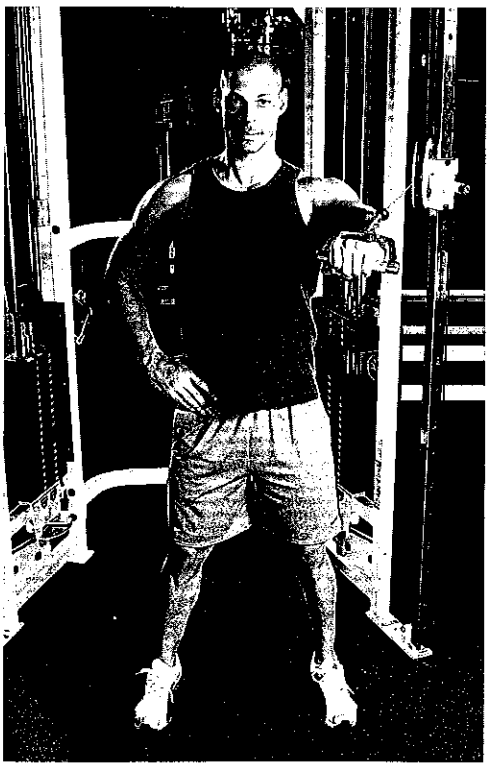
One-Arm Cable Chest Press

START

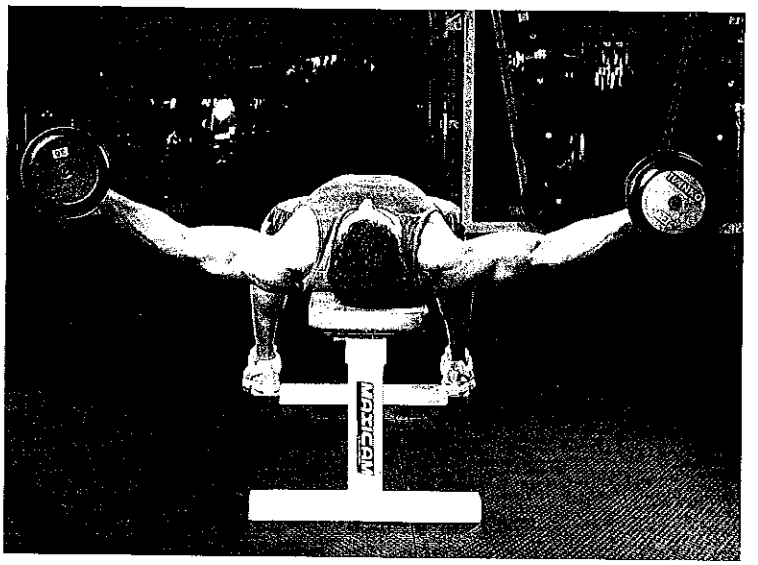
Stand facing away from a pulley cable apparatus with your feet shoulder-width apart or wider; maintain a slight bend in your knees. If the pulley height is adjustable, bring it to just above shoulder height. Grasp the single-handle D-grip with an overhand grip and hold it just outside your shoulder with your elbow out to your side so that your upper arm is just below parallel with the floor.

MOVE

Forcefully press the handle out in front of you until your arm is fully extended in front of your chest but your elbow is not locked out. Reverse the motion, being sure not to return the handle behind the level of your chest.



Dumbbell Fly



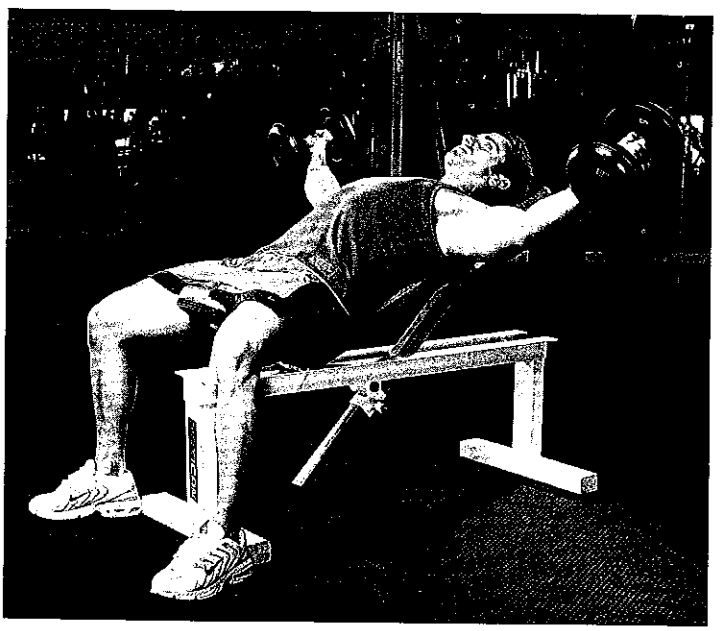
START

Lie on a flat bench with your feet flat on the floor and your back pressed against the pad. Begin by holding the dumbbells with your arms straight up from your shoulders and the weights directly over your chest. Your palms should face each other and your elbows should be slightly bent. Maintain this angle of your elbows throughout the entire exercise.

MOVE

Slowly lower your arms out to your sides until your wrists come to about shoulder level or slightly above. Bring your arms back toward the midline of your body, focusing on using your pec muscles to draw them back together.

Incline Dumbbell Fly



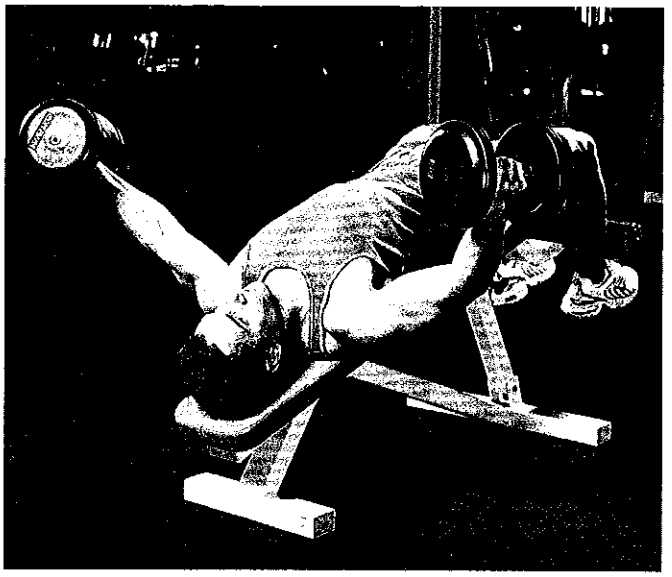
START

Set an incline bench at a 30- to 45-degree angle. Lie on the bench with your feet flat on the floor and your back pressed against the pad. Begin by holding the dumbbells with your arms straight up from your shoulders and the dumbbells directly over your upper chest. Your palms should face each other and your elbows should be slightly bent. Maintain this angle of your elbows throughout the entire exercise.

MOVE

Slowly lower your arms out to your sides until your wrists come to about shoulder level or slightly above. Bring your arms back toward the midline of your body, focusing on using your pec muscles to draw them back together.

Decline Dumbbell Fly



START

Set an decline bench at a 30- to 40-degree angle. Lie on the bench with your feet secured under the ankle pads and your back pressed against the pad. Begin by holding the dumbbells with your arms straight up from your shoulders and the dumbbells directly over your lower chest. Your palms should face each other and your elbows should be slightly bent. Maintain this angle of your elbows throughout the entire exercise.

MOVE

Slowly lower your arms out to your sides until your wrists come to about shoulder level or slightly above. Bring your arms back toward the midline of your body, focusing on using your pec muscles to draw them back together.

Exercise-Ball Dumbbell Fly

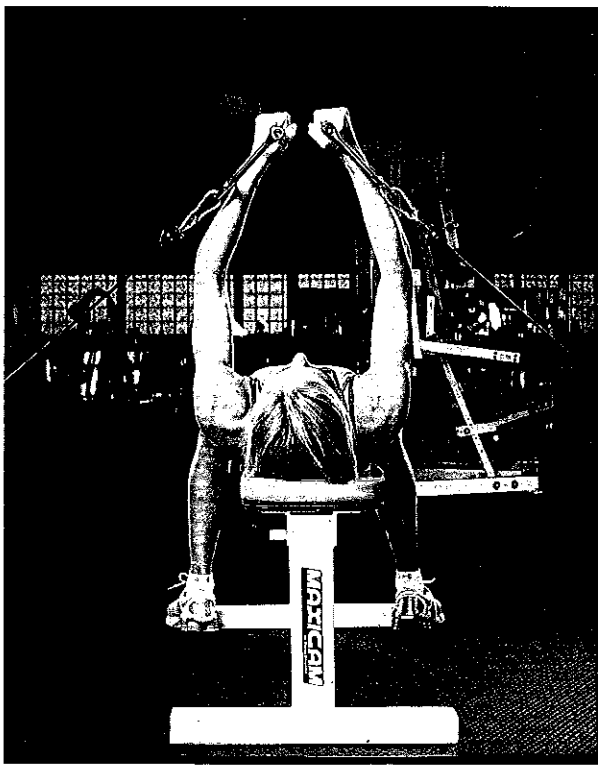
START

This exercise is similar to the fly on the flat bench except that here your body works harder to keep you stabilized. Grab two dumbbells and lie back on a ball so that you face the ceiling. Your feet should be firmly planted on the floor about shoulder-width apart. Begin by holding the dumbbells with your arms straight up from your shoulders and the weights directly over your chest. Your palms should face each other and your elbows should be slightly bent. Maintain this angle of your elbows throughout the entire exercise.

MOVE

Slowly lower your arms out to your sides until your wrists come to about shoulder level or slightly above. Bring your arms back toward the midline of your body, focusing on using your pec muscles to draw them back together.

Cable Fly



START

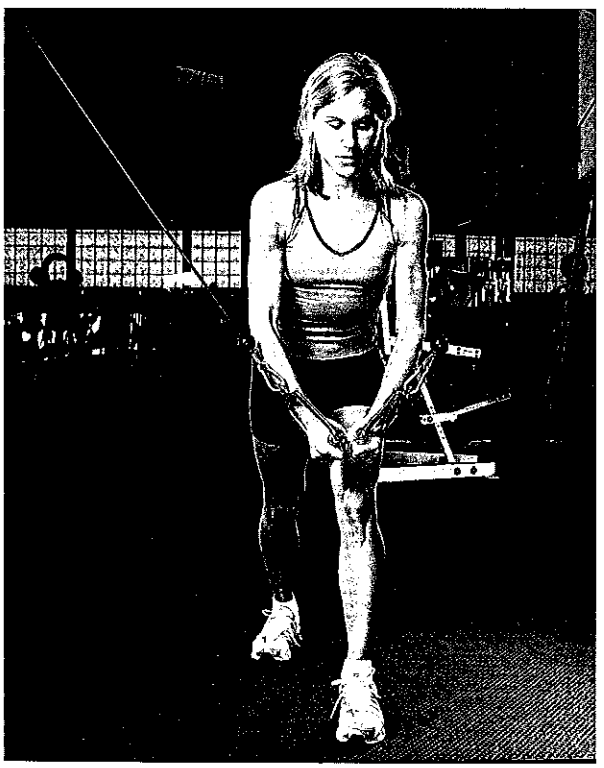
Connect two of the single-handle D-grips to the low pulleys of a cable crossover apparatus. Position the bench in the middle of the cable crossover apparatus so that the cables are in line with your chest. Lie on the bench with your feet flat on the floor and your back pressed against the pad. Begin by holding the handles with your arms straight out at your sides and your palms facing up while maintaining a slight bend in your elbows.

MOVE

Use your pecs to bring the arms up and together over your chest until your hands meet, maintaining the slight bend in your elbows as you do. Slowly return to the starting position by lowering your arms back out to your sides until your wrists come to about shoulder level or slightly above.

Note: You can also do this exercise on an incline bench, decline bench, or exercise ball in a similar manner.

Cable Crossover



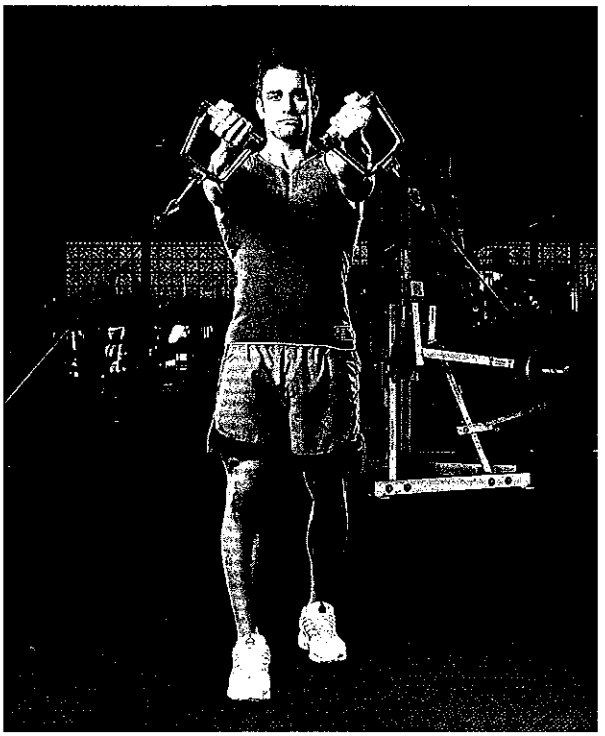
START

Attach single-handle D-grip handles to the upper pulleys on a cable crossover apparatus. Stand in the direct center of the machine with one foot in front of the other and your knees slightly bent. Grasp the handles with your palms facing down, and keep your elbows slightly bent and pointing up toward the ceiling. Lean slightly forward at the waist.

MOVE

In a simultaneous downward and inward motion, bring the handles to a point in the front of your midsection, keeping your arms slightly bent. Pause a moment and squeeze your pec muscles before slowly allowing the handles to return to the starting position.

Low-Pulley Cable Crossover



START

Attach single-handle D-grip handles to the lower pulleys on a cable crossover apparatus. Stand in the direct center of the apparatus with one foot in front of the other and your knees slightly bent. Grasp the handles with your palms facing up, and keep your elbows slightly bent and pointing down toward the floor and behind you. Maintain the arch in your low back and keep your chest up.

MOVE

In a simultaneous upward and inward motion, bring the handles to a point straight out in front of you so that your hands are level with your chin. Pause a moment and squeeze your pec muscles before slowly allowing the handles to return to the starting position.

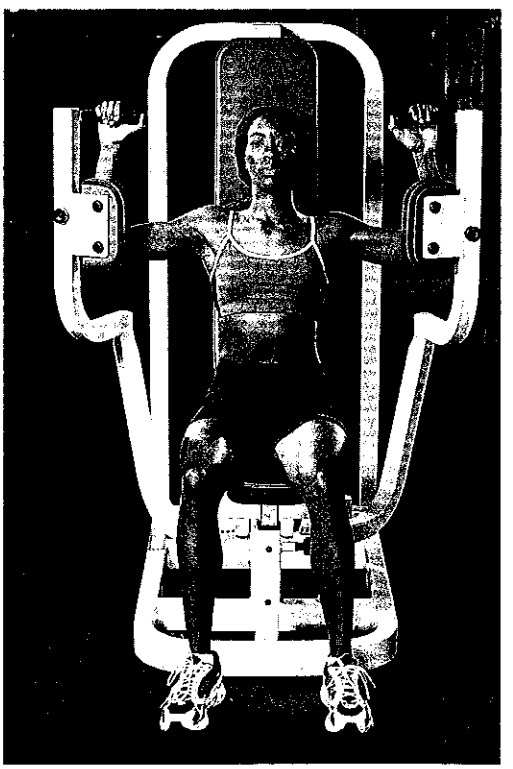
Pec Deck

START

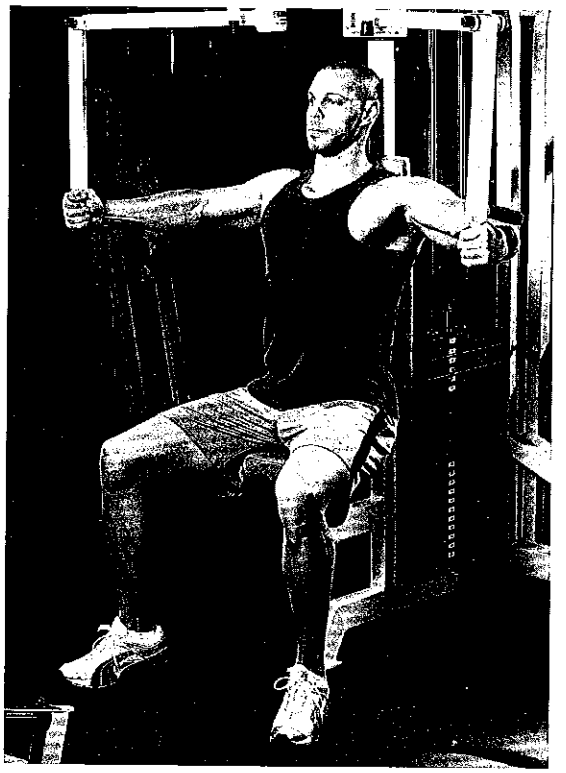
Sit in a pec deck station, placing your elbows and upper arms on the arm pads. Adjust the seat so that your elbows are in line with your shoulders and your upper arms are parallel to the floor.

MOVE

Flex your pecs to bring the pads together in front of your chest. Squeeze your pec muscles for a second and then slowly return your arms to the starting position.



Fly Machine



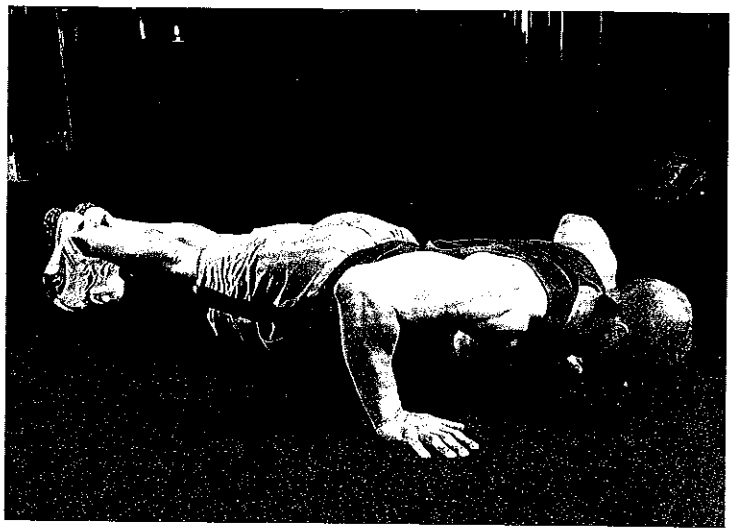
START

Adjust the seat so that your shoulders, elbows, and hands are all in line and your arms are parallel to the floor when you grab the handles. Your elbows should be slightly bent and pointing behind you and your back should be flat against the back pad.

MOVE

Forcefully bring the handles all the way together, making sure to keep your elbows bent. Squeeze your pecs for a second before reversing the motion to allow the handles to go back to a point where your hands are even with your chest.

Push-Up



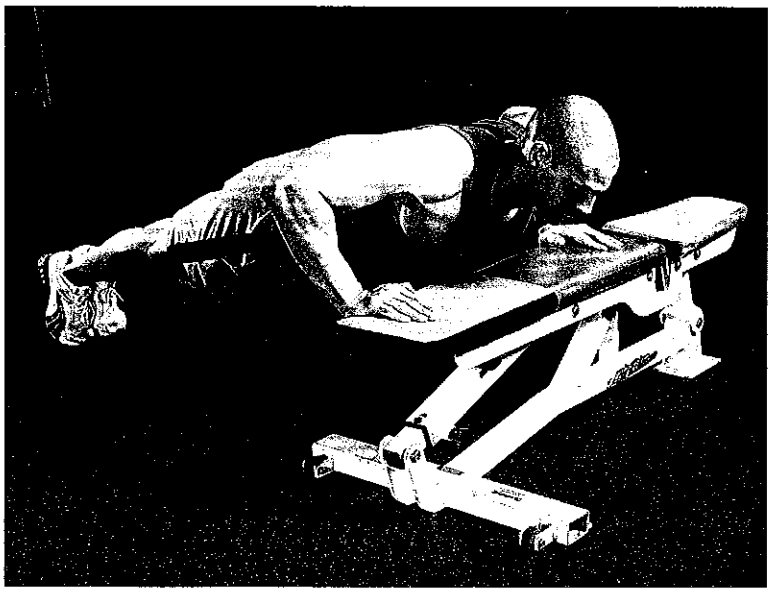
START

Lie facedown on the floor with your hands slightly wider than shoulder width. Your palms should be flat on the floor and your elbows out to your sides. Your body should be straight with just your palms and toes touching the floor.

MOVE

Raise your body up by pushing your palms into the floor to fully extend your arms without locking out the elbows at the top. Reverse the movement to return your body toward the floor.

Incline Push-Up



START

This is similar to the push-up but with your hands on a bench. Your hands should be placed firmly on the bench and spaced slightly wider than shoulder-width apart. Elbows are bent and upper arms are out to your sides. Your body should be extended behind you with just your toes touching the floor.

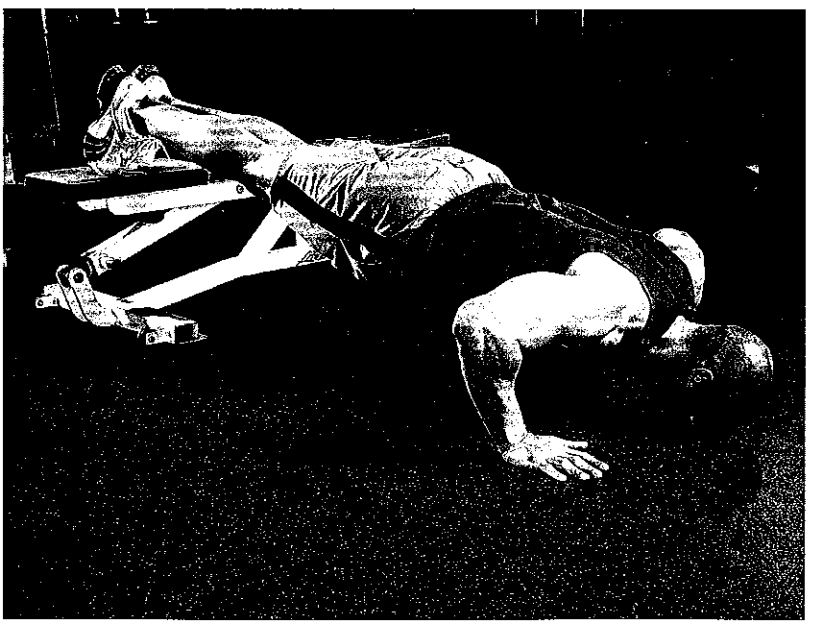
MOVE

Raise your body up by pushing your palms into the bench to fully extend your arms without locking out the elbows at the top. Reverse the movement to return your upper body toward the bench.

Decline Push-Up

START

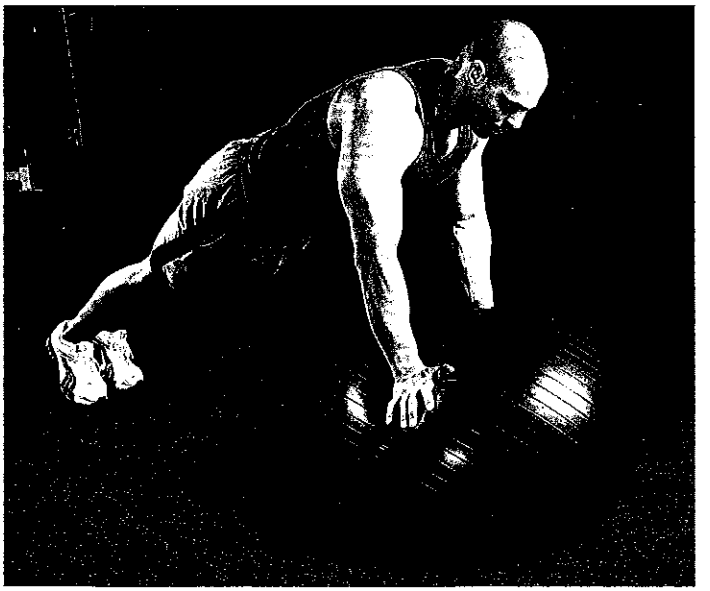
This is similar to the incline push-up, but your body position is reversed. Your hands are placed firmly on the floor and spaced slightly wider than shoulder-width apart. Elbows are bent and upper arms are out to your sides. Your body should be extended behind you with just your feet up on the bench and just your toes touching the bench.



MOVE

Raise your body up by pushing your palms into the floor to fully extend your arms without locking out the elbows at the top. Reverse the movement to return your upper body toward the floor.

Exercise-Ball Push-Up



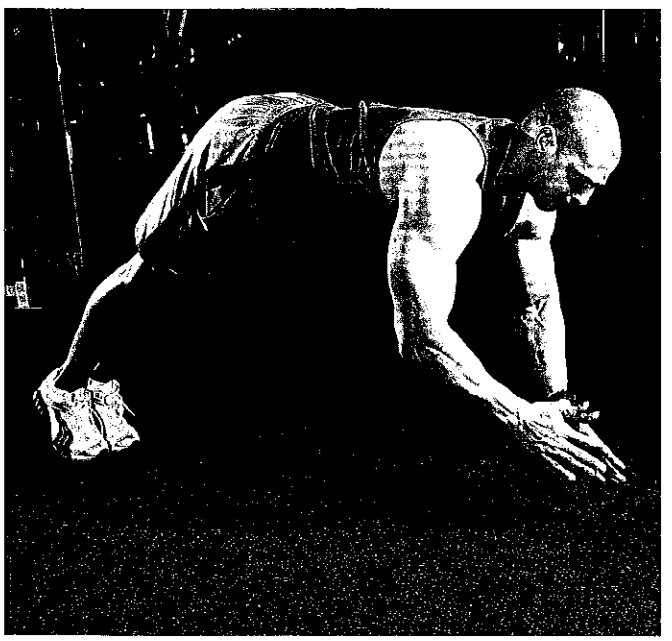
START

This exercise is similar to the incline push-up but uses a ball instead of a bench. Make sure the ball is fairly secure and get into push-up position with your hands on the ball and feet on the floor. Your elbows should be bent with your upper arms out to your sides.

MOVE

Keeping your body straight, raise your body up by pushing your palms into the ball to fully extend your arms without locking out the elbows at the top. Reverse the movement to return your upper body toward the ball.

Power Push-Up



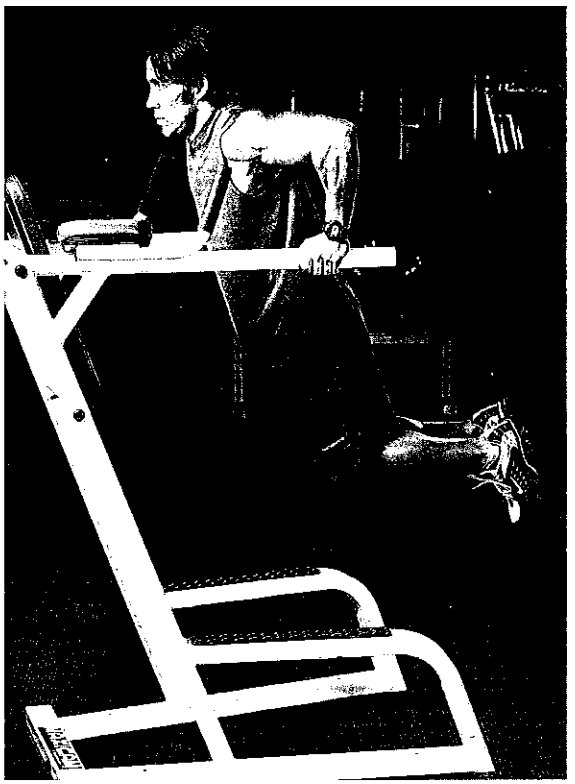
START

Lie facedown on the floor with your hands slightly wider than shoulder-width apart. Palms are flat on the floor and elbows are out to your sides. Your body should be straight with just your palms and toes touching the floor.

MOVE

Raise your body up from the floor by explosively pushing your palms into the floor to fully extend your arms so that your palms leave the floor. As you land, allow your elbows to bend and immediately lower your body back to the floor.

Chest Dip



START

Grasp the dip bars with your arms extended and locked. Lean forward and bend your knees while keeping your legs crossed.

MOVE

Keep your elbows out to your sides as you bend them to lower your body down until your upper arms are about parallel to the floor. Press your hands into the bars to extend your arms and raise your body back up.

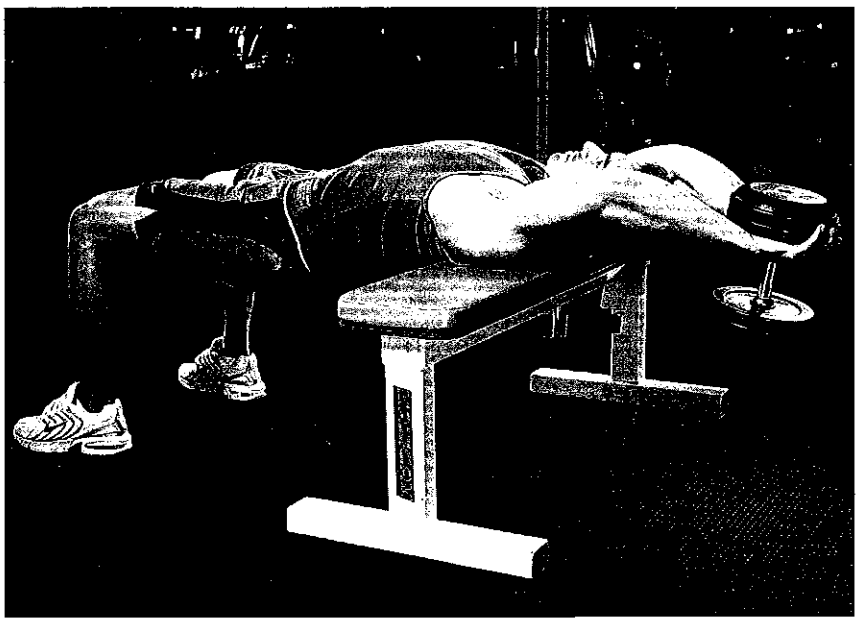
Dumbbell Pullover

START

Lie across a flat bench with your upper back supported by the bench and your feet flat on the floor about shoulder-width apart or wider. Hold the inside edge of a dumbbell at arm's length directly over your chest and drop your hips slightly toward the floor.

MOVE

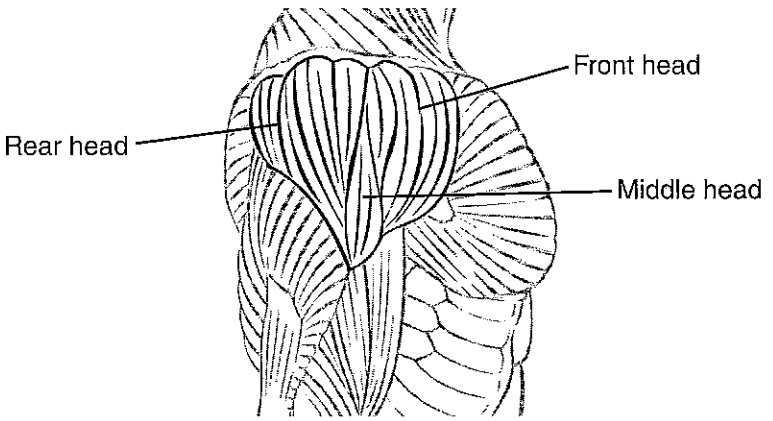
Bring your arms back behind your head as far as possible while keeping a slight bend in your elbows. Reverse the direction and pull the weight back up over your chest.



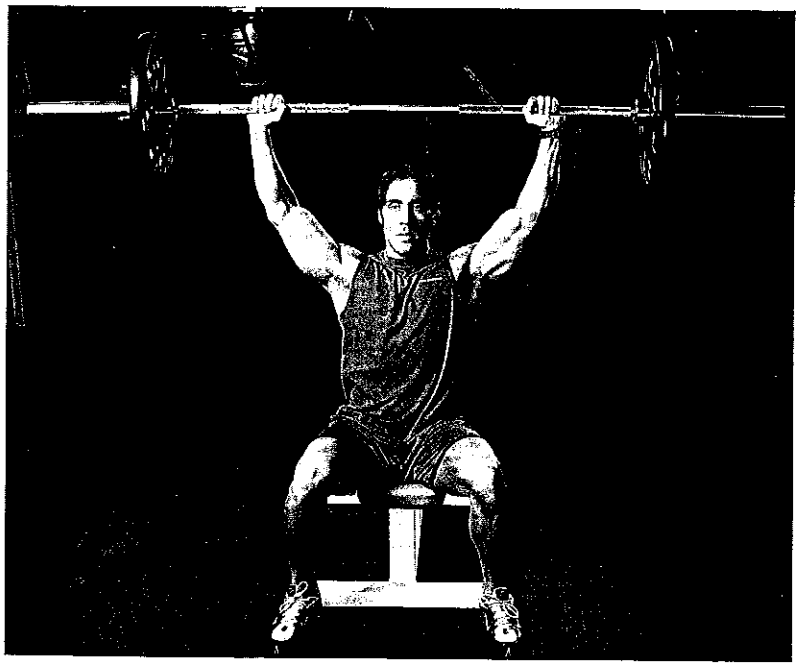
CHAPTER 12

Shoulders

This chapter contains detailed descriptions of all major exercises that focus on the shoulders, or deltoid muscles. The deltoid muscles are divided into the front (anterior) head, middle head, and rear (posterior) head. (See the diagram below.) Although many of these exercises are pressing movements (such as the barbell overhead press) that are multijoint exercises, requiring the use of the trapezius and the triceps as well as the deltoids, they are considered primarily shoulder exercises because of the movement of the upper arms overhead. The shoulder exercises are divided into pressing exercises. The pressing exercises are further divided into barbell overhead pressing exercises, dumbbell overhead pressing exercises, machine overhead pressing exercises, and isolation exercises. The isolation exercises are further divided into upright rowing exercises, front raise exercises, lateral raise exercises, and rear deltoid exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Seated Barbell Overhead Press



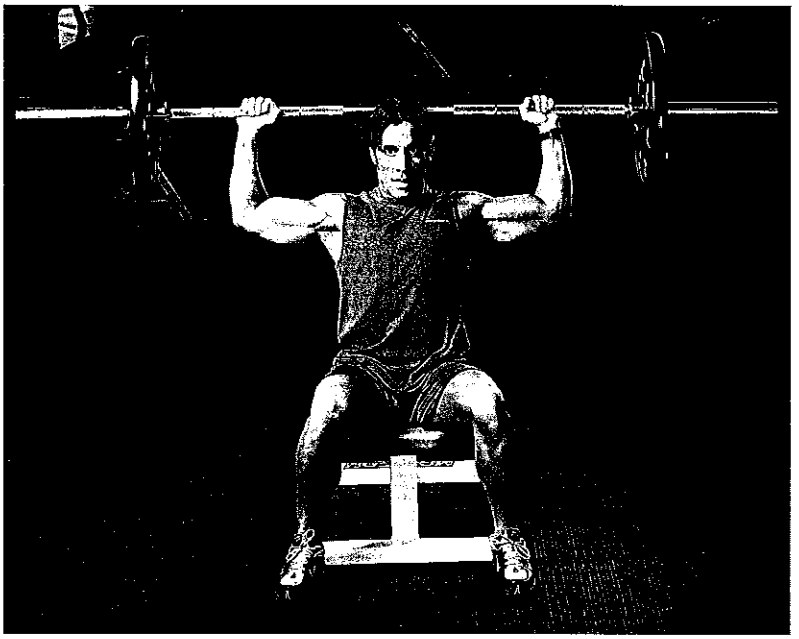
START

Sit on a bench with a vertical back, such as a shoulder press bench, or an adjustable bench that adjusts to 90 degrees. Plant your feet flat on the floor and unrack the bar using an overhand grip with your hands slightly wider than shoulder width on the bar. Bring the bar over and in front of your head to the starting position—under your chin and just above your upper chest.

MOVE

Press the bar straight up overhead until your arms are fully extended but not locked out. Slowly lower the bar back to the starting position.

Seated Barbell Behind-the-Neck Press



START

Sit on a bench with a vertical back, such as a shoulder press bench or an adjustable bench that adjusts to 90 degrees. Plant your feet flat on the floor and unrack the bar using an overhand grip with your hands slightly wider than shoulder width on the bar. Bring the bar behind your head to a level that is even with the lower part of your ears.

MOVE

Press the bar straight up overhead and slightly back until your arms are fully extended but not locked out. Slowly lower the bar back to the starting position.

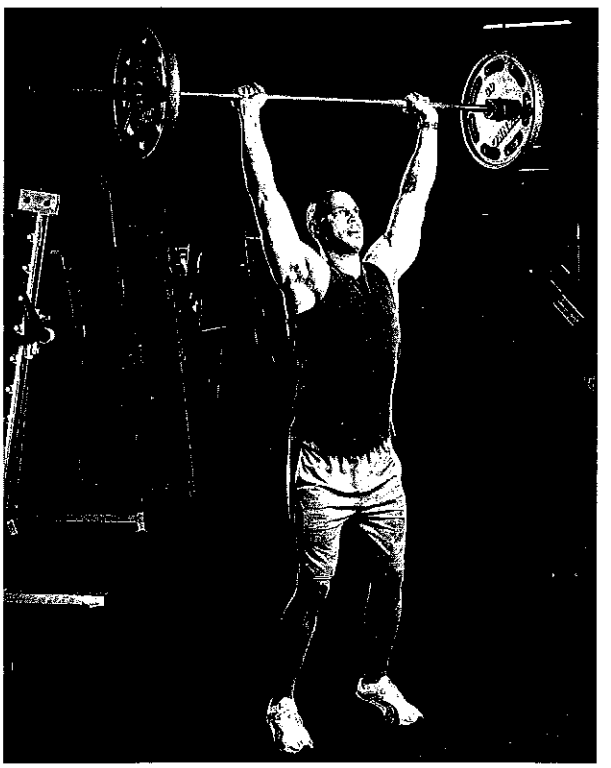
Standing Barbell Overhead Press

START

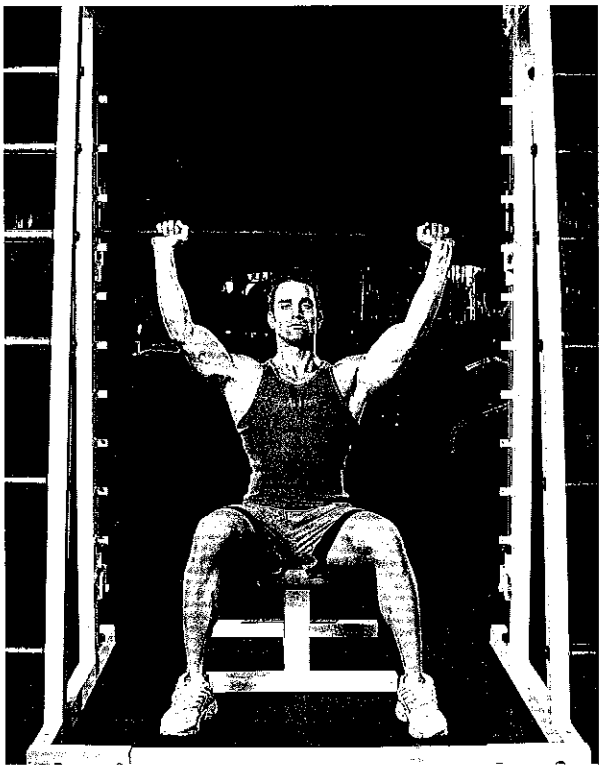
Stand holding a barbell with an overhand grip with your hands spaced just outside shoulder width. Hold the bar just over your upper chest and below your chin. Your feet should be spaced just slightly wider than shoulder width and your knees should have a slight bend.

MOVE

Press the bar straight overhead, stopping just short of elbow lockout. Then slowly lower the bar back to the starting position.



Smith Machine Seated Overhead Front Press



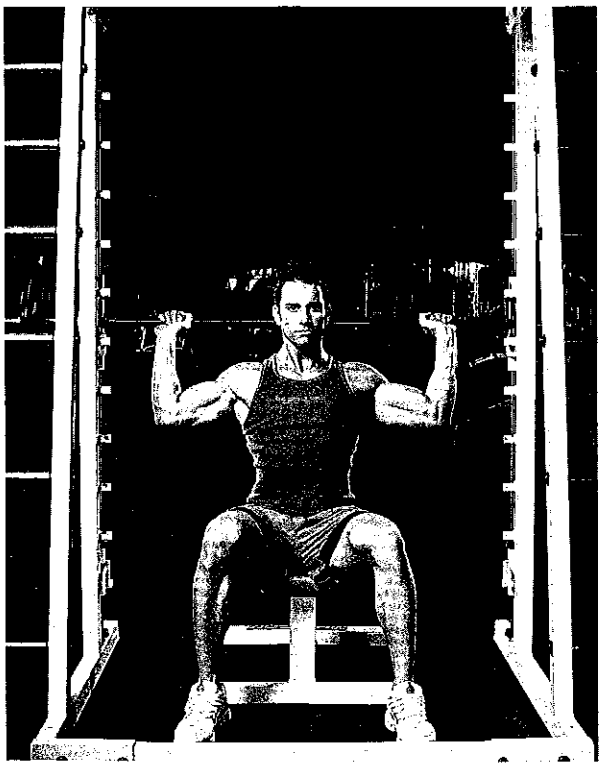
START

Position an adjustable bench to 90 degrees, and place it within the Smith machine so that the bar lowers just in front of your face. Sit on the bench with your feet flat on the floor and your back flat against the bench. Grasp the bar just outside shoulder width and unlatch it from the safety supports. Lower the bar to just below your chin.

MOVE

Contract your shoulders and extend your arms to press the weight up until your arms are fully extended but not locked out. Slowly lower the bar back to the starting position.

Smith Machine Seated Behind-the-Neck Press



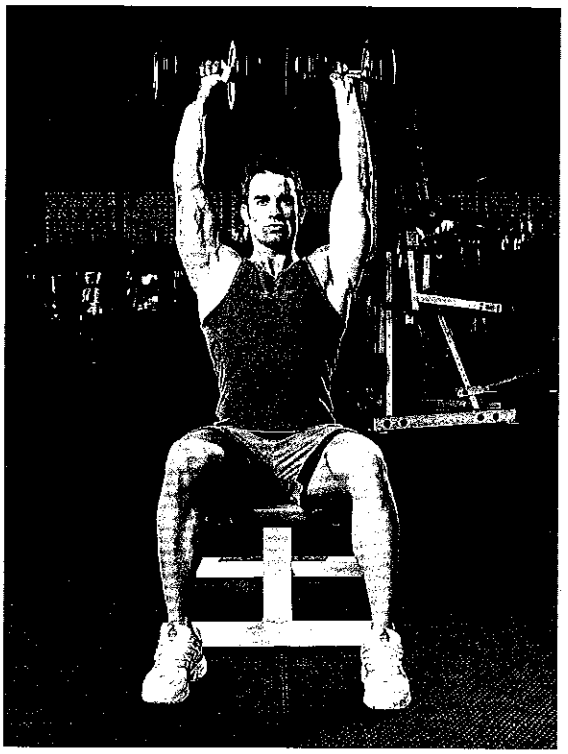
START

Position an adjustable bench to 90 degrees, and place it within the Smith machine so that the bar lowers just behind your head. Sit on the bench with your feet flat on the floor and your back flat against the bench. Grasp the bar just outside shoulder width and unlatch it from the safety supports. Lower the bar behind the head to lower-ear level.

MOVE

Press the bar straight up overhead until your arms are fully extended but not locked out. Slowly lower the bar back to the starting position.

Seated Dumbbell Overhead Press



START

Sit on a low straight-back bench with your feet firmly planted on the floor. Hold a pair of dumbbells at shoulder height. Begin with your palms facing forward and your elbows just below shoulder level but slightly forward. Forearms are angled in slightly so that the inner plates of the dumbbells are directly above your shoulders.

MOVE

Push the weights straight up, stopping just short of locking out your elbows. Then control the dumbbells all the way down until your upper arms are parallel with the floor or slightly lower and the weights are at approximately ear level.

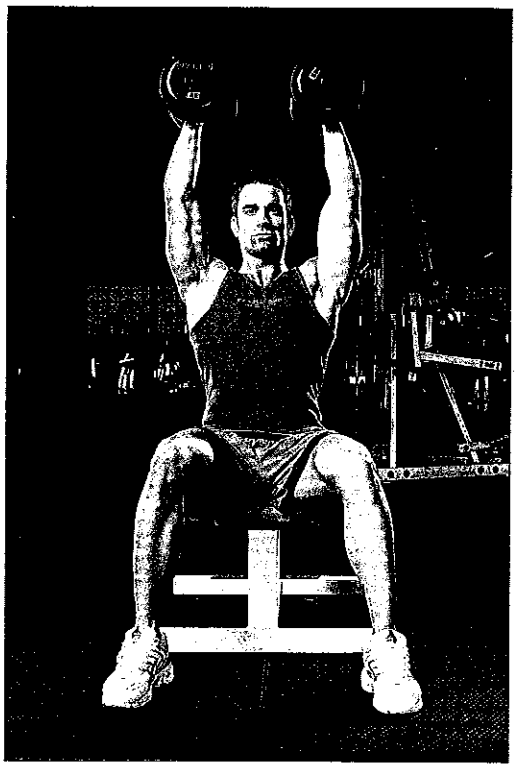
Seated Neutral-Grip Overhead Dumbbell Press

START

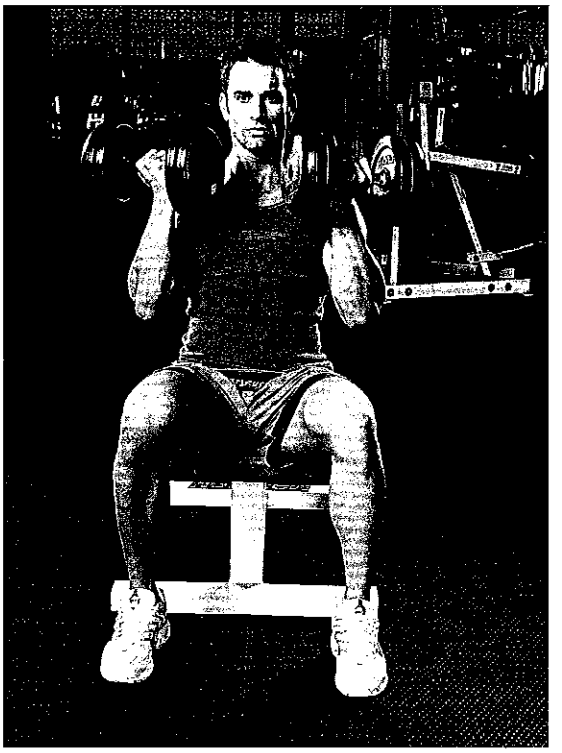
Sit on a low straight-back bench with your feet firmly planted on the floor. Hold a pair of dumbbells at shoulder height. Begin with your palms facing toward each other and your elbows just below shoulder level and directed forward.

MOVE

Push the weights straight up, stopping just short of locking out your elbows. Then control the dumbbells all the way down until your upper arms are parallel with the floor or slightly lower and your elbows are pointed forward and the weights are at approximately ear level.



Arnold Press



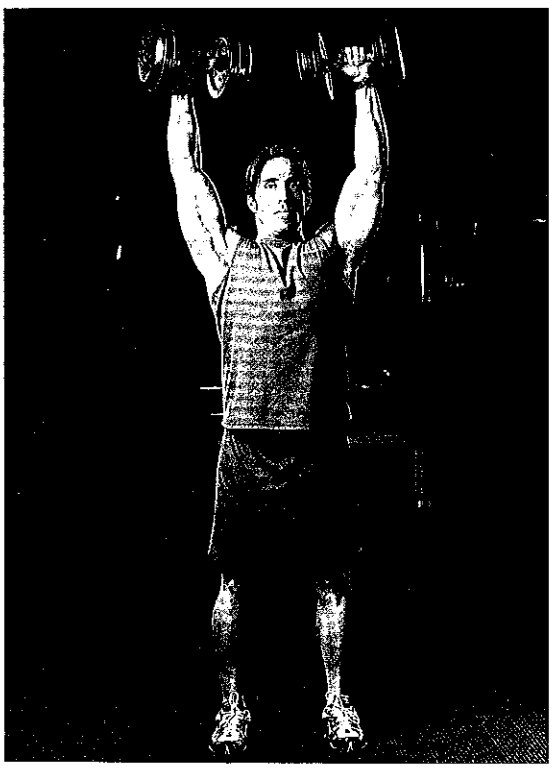
START

Sit on a low straight-back bench with your feet firmly planted on the floor. Hold a pair of dumbbells at shoulder height. Begin with your palms facing toward your shoulders and your elbows down and forward.

MOVE

Push the weights straight up, pronating your hands once the dumbbells reach eye level so that your palms are facing forward at full arm extension. Control the dumbbells all the way back down in the reverse motion to the starting position.

Standing Dumbbell Overhead Press



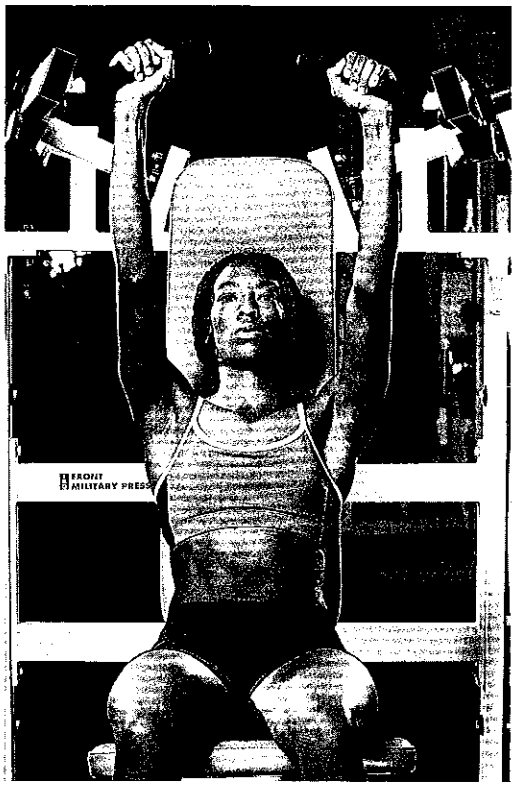
START

Stand holding a pair of dumbbells at shoulder height with your feet about shoulder-width apart and knees slightly bent. Begin with your palms facing forward and your elbows just below shoulder level but slightly forward. Forearms are angled in slightly so that the inner plates of the dumbbells are directly above your shoulders.

MOVE

Push the weights straight up, stopping just short of locking out your elbows. Then control the dumbbells all the way down until your upper arms are parallel with the floor or slightly lower and the weights are at approximately ear level.

Seated Machine Overhead Press



START

Sit in a seated machine overhead press station with your feet firmly planted on the floor and your back flat against the seat back. Hold the machine handles with your palms facing forward and your hands slightly wider than shoulder-width apart.

MOVE

Push the handle up overhead to full arm extension, stopping just short of locking out your elbows. Then control the weight all the way down until your upper arms are parallel with the floor or slightly lower and the handle is at approximately ear level.

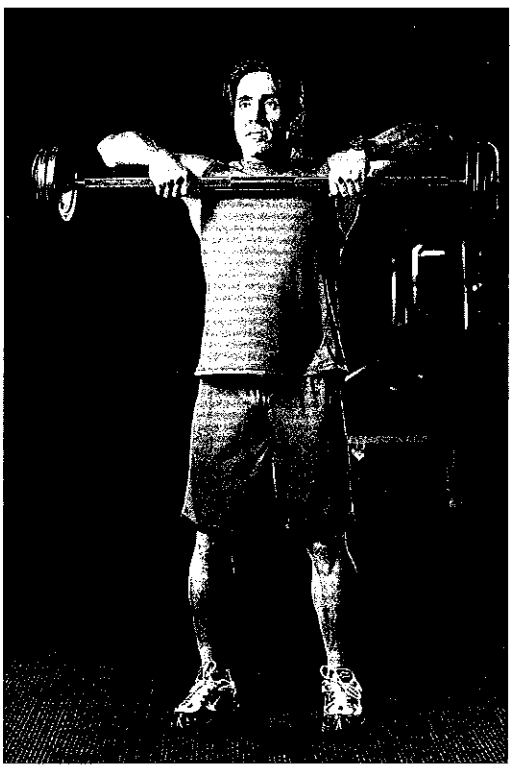
Barbell Upright Row

START

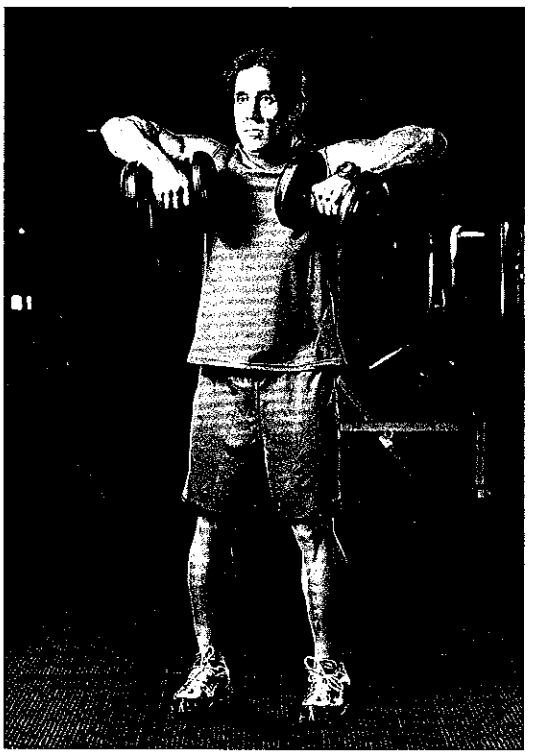
Stand holding a barbell across the front of your thighs with your feet shoulder-width apart and knees slightly bent. Your hands should be about hip-width apart for regular upright rows and wider than shoulder width for wide-grip upright rows.

MOVE

Lift the bar straight up to upper-chest height, keeping the bar close to your body and keeping your elbows higher than your wrists at all times. Pause for a moment at the top and then slowly lower the bar back to the starting position.



Dumbbell Upright Row



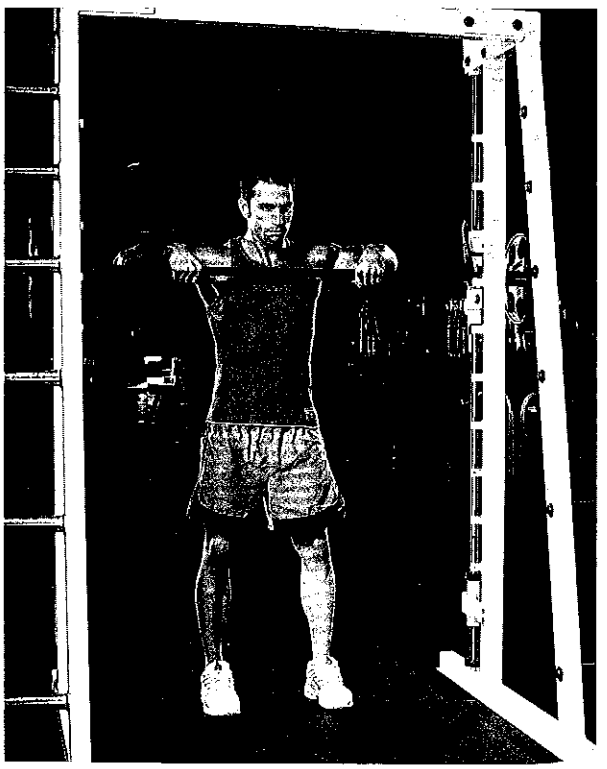
START

Stand with your feet shoulder-width apart, holding a pair of dumbbells in front of your thighs. Palms are facing toward your legs and elbows are slightly bent.

MOVE

Bring your elbows up and out to your sides as you lift the dumbbells, keeping your wrists straight and the dumbbells close to your body. When your elbows reach shoulder level, hold for a second in the top position before slowly lowering the dumbbells to the starting position.

Smith Machine Upright Row



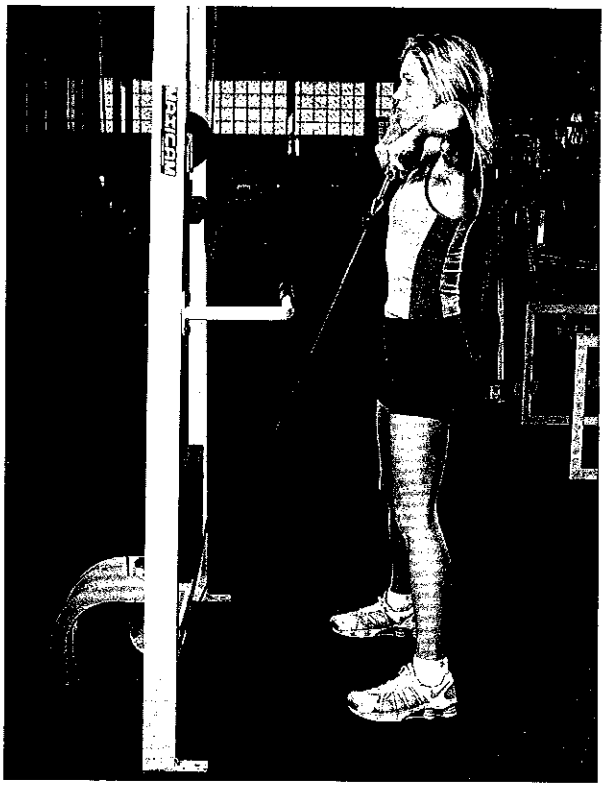
START

Stand in the middle of a Smith machine, holding the bar with an overhand grip across the front of your thighs. Your feet are shoulder-width apart and knees are slightly bent. Your hands should be about hip-width apart for regular upright rows and wider than shoulder width for wide-grip upright rows.

MOVE

Lift the bar up to upper-chest height while keeping your elbows higher than your wrists at all times. Pause for a moment at the top and then slowly lower the bar back to the starting position.

Cable Upright Row



START

Stand in front of a pulley cable apparatus holding a straight bar attached to a low pulley with an overhand grip that is about hip-width apart. Your feet should be shoulder-width apart and your knees are slightly bent. The bar is across the front of your thighs.

MOVE

Lift the bar up to upper-chest height while keeping your elbows higher than your wrists at all times. Pause for a moment at the top and then slowly lower the bar back to the starting position.

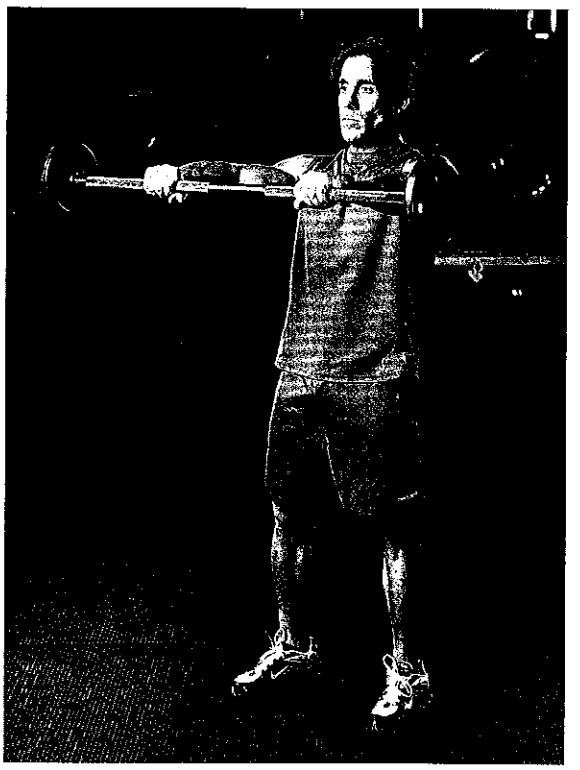
Barbell Front Raise

START

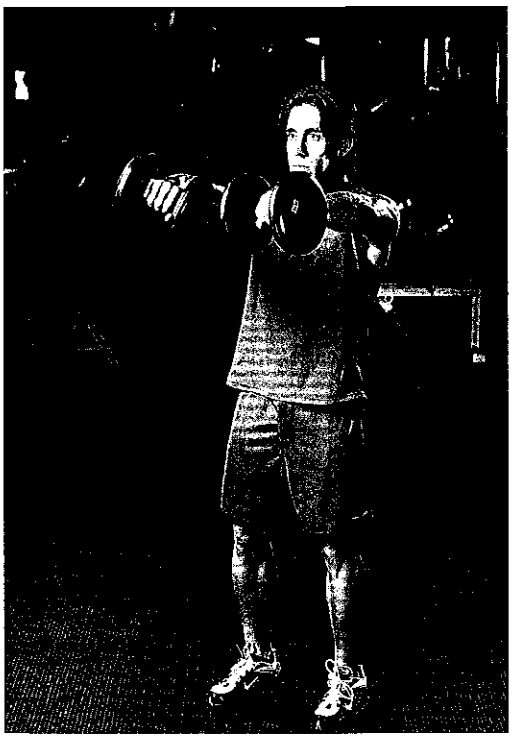
Stand holding a barbell across the front of your thighs. Your feet are shoulder-width apart and knees are slightly bent. You should have an overhand grip with your hands about hip-width apart.

MOVE

Lift the bar straight up and out in front of your body until your arms are just past parallel with the floor. Pause for a moment at the top before slowly lowering the bar back to the starting position.



Dumbbell Front Raise



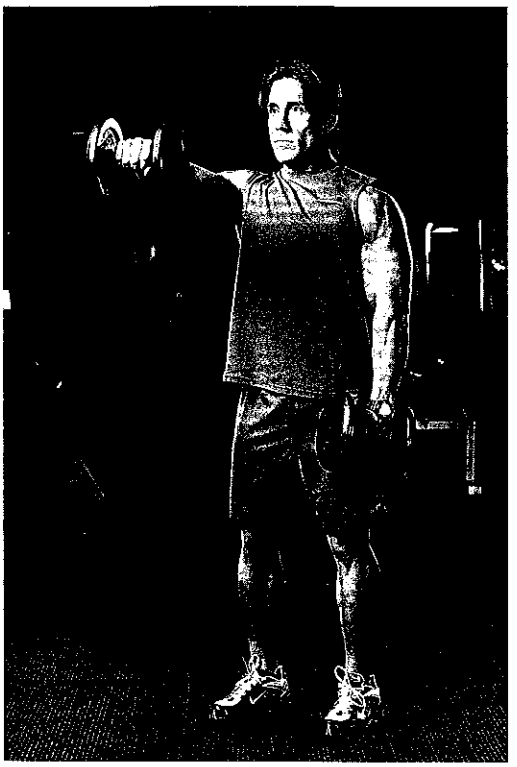
START

Stand holding a pair of dumbbells across the front of your thighs. Your feet are shoulder-width apart and knees are slightly bent. You should have an overhand grip.

MOVE

Lift the dumbbells straight up and out in front of your body until your arms are just past parallel with the floor. Pause for a moment at the top before slowly lowering the bar back to the starting position. To do alternating front dumbbell raise, lift one dumbbell up and down at a time, alternating sides.

One-Arm Dumbbell Front Raise



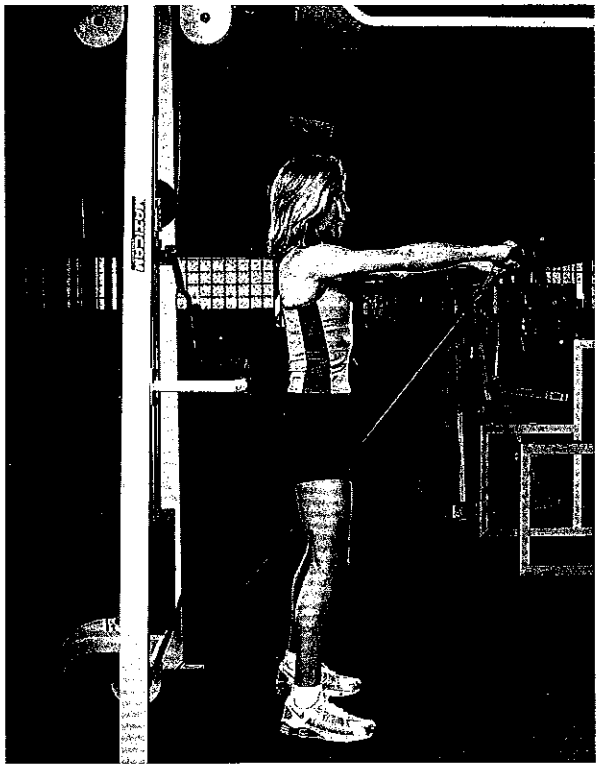
START

Stand holding a dumbbell with one hand across the front of your thigh. Feet are shoulder-width apart and knees are slightly bent. You should have an overhand grip.

MOVE

Lift the dumbbell straight up and out in front of your body until your arm is just past parallel with the floor. Pause for a moment at the top before slowly lowering the dumbbell back to the starting position. Repeat for the other arm.

Cable Front Raise



START

Stand with your back toward a low-pulley cable apparatus. With an overhand grip, grab onto the straight-bar attachment connected to the low pulley. The bar should be in front of your thighs with the cable running through your legs. This can also be done with a rope attachment using a neutral grip.

MOVE

In a smooth motion, lift the handle up and straight out in front of you until your arms are just past parallel with the floor, keeping your arms straight throughout. Hold for a second and then slowly lower the attachment back to the starting position.

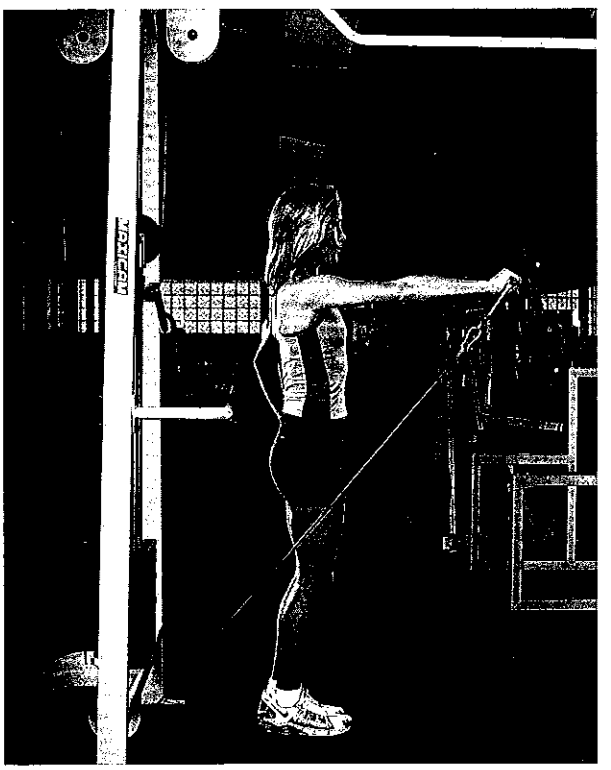
One-Arm Cable Front Raise

START

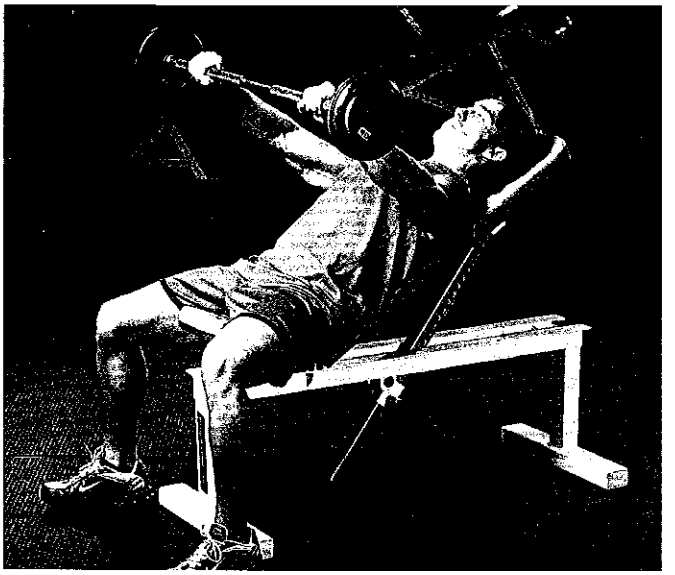
Stand with your back toward a low-pulley cable apparatus. With one hand in an overhand grip, grab onto the single-handle D-grip attachment connected to the low pulley. The handle should be on the side of your thighs.

MOVE

In a smooth motion, lift the handle up and straight out in front of you until your arm is just past parallel with the floor, keeping your arm straight throughout. Hold for a second and then slowly lower the attachment back to the starting position.



Seated Incline Front Raise



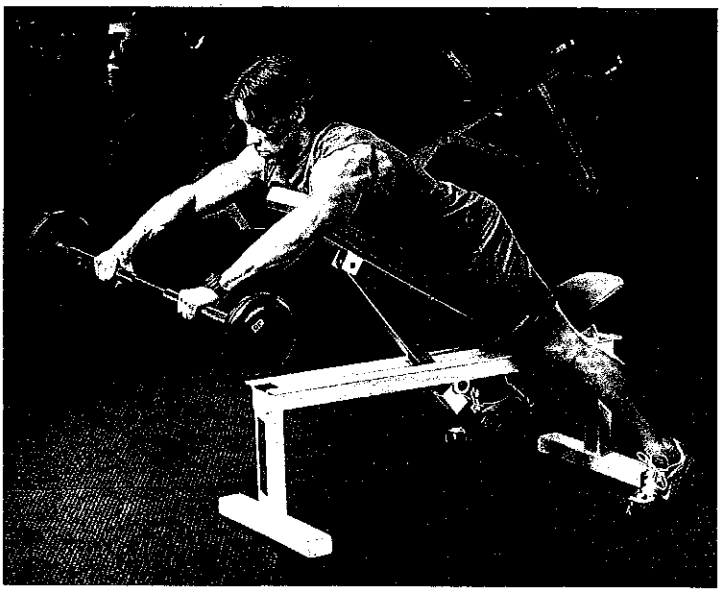
START

Sit on an incline bench set to 45 degrees while holding a barbell across your thighs. You should have an overhand grip on the bar using a shoulder-width grip.

MOVE

Lift the bar up in front of you until your arms are past parallel with the floor, keeping your arms straight throughout. Hold for a second and then slowly lower the bar back to the starting position.

Prone Incline Front Raise



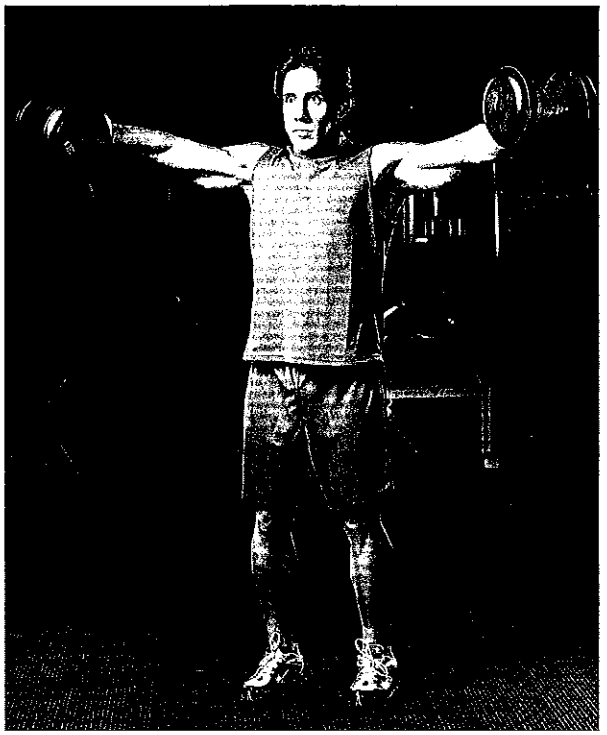
START

Sit in reverse direction straddling an incline bench set to 45 degrees while holding a barbell with an overhand grip. Your feet should be flat on the floor with your chest pressed into the bench and your chin above the top of the bench. With an overhand grip, hold the barbell with your hands shoulder-width apart. The barbell should hang straight down from your shoulders.

MOVE

Lift the bar up in front of you until your arms are parallel with the floor, keeping your arms straight throughout. Hold for a second and then slowly lower the bar back to the starting position.

Dumbbell Lateral Raise



START

Stand with your feet about shoulder-width apart while holding two dumbbells with neutral grips at your sides.

MOVE

Slowly raise the dumbbells up and out to your sides. Keep your arms straight with a very slight bend in your elbows. When your arms reach just above parallel with the floor, pause in this position for a second before slowly lowering the dumbbells back to the starting position.

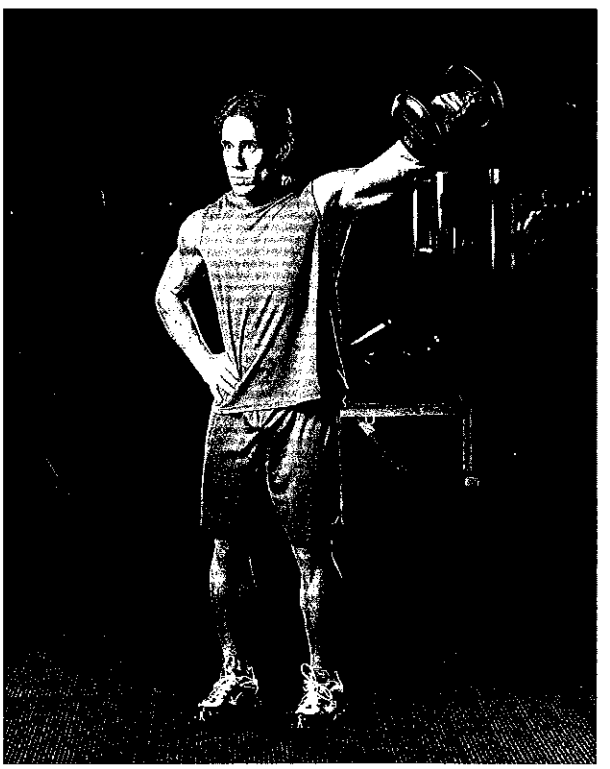
One-Arm Dumbbell Lateral Raise

START

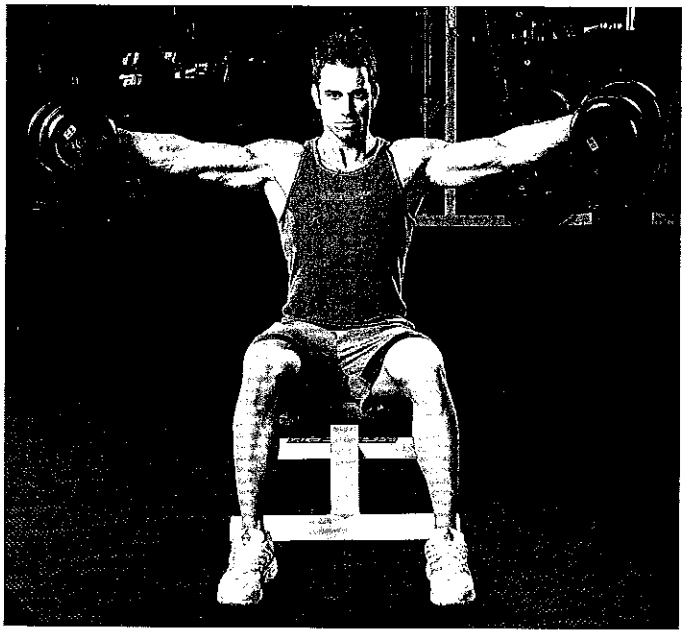
Stand with your feet about shoulder-width apart while holding one dumbbell with a neutral grip at your side.

MOVE

Slowly raise the dumbbell up and out to your side. Keep your arm straight with a very slight bend in your elbow. When your arm reaches just above parallel with the floor, pause in this position for a second before slowly lowering the dumbbell back to the starting position. Repeat with the other arm.



Seated Dumbbell Lateral Raise



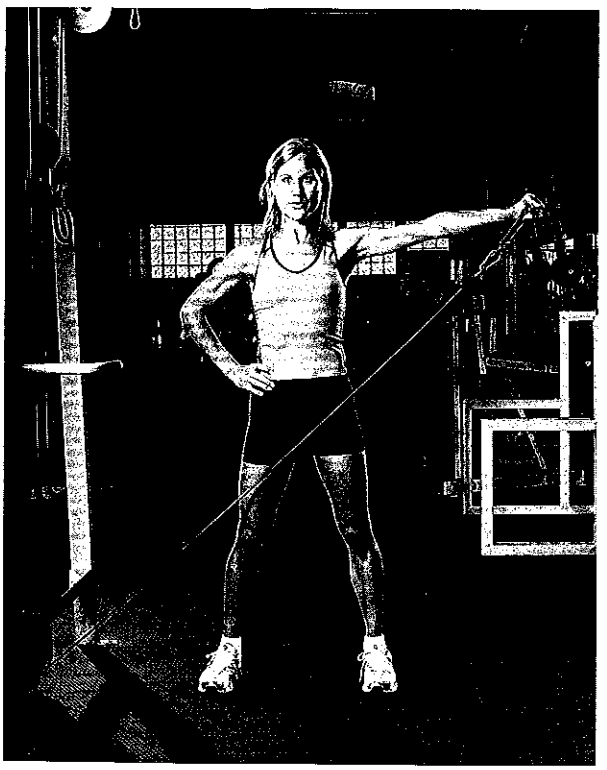
START

Sit on a flat bench with your feet firmly planted on the floor while holding two dumbbells with neutral grips at your sides.

MOVE

Slowly raise the dumbbells up and out to your sides. Keep your arms straight with a very slight bend in your elbows. When your arms reach just above parallel with the floor, pause in this position for a second before slowly lowering the dumbbells back to the starting position.

One-Arm Cable Lateral Raise (Front of Body or Behind)



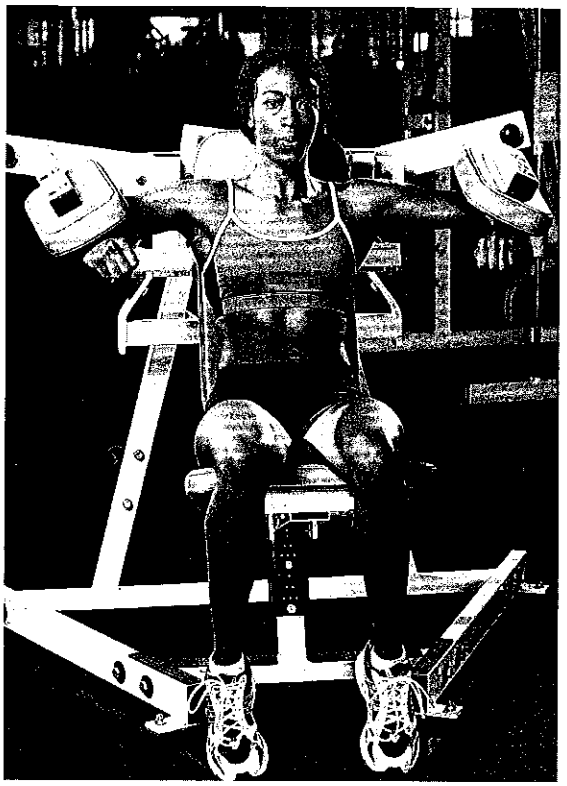
START

Stand with your right shoulder toward a low-pulley cable apparatus. Your feet should be about shoulder-width apart. Hold a single-handle D-grip attachment that is attached to the low pulley in your left hand in front of your left thigh or behind your left thigh.

MOVE

Slowly raise the handle up and out to your side, keeping your arm straight with a very slight bend in your elbow. When your arm reaches just above parallel with the floor, pause in this position for a second before slowly lowering the handle back to the starting position.

Machine Lateral Raise



START

Sit in a lateral raise machine with your upper arms pressed against the arm pads of the machine.

MOVE

Lift your upper arms up and out to your sides until your arms are parallel with the floor. Pause for a second and then slowly return your arms to the starting position.

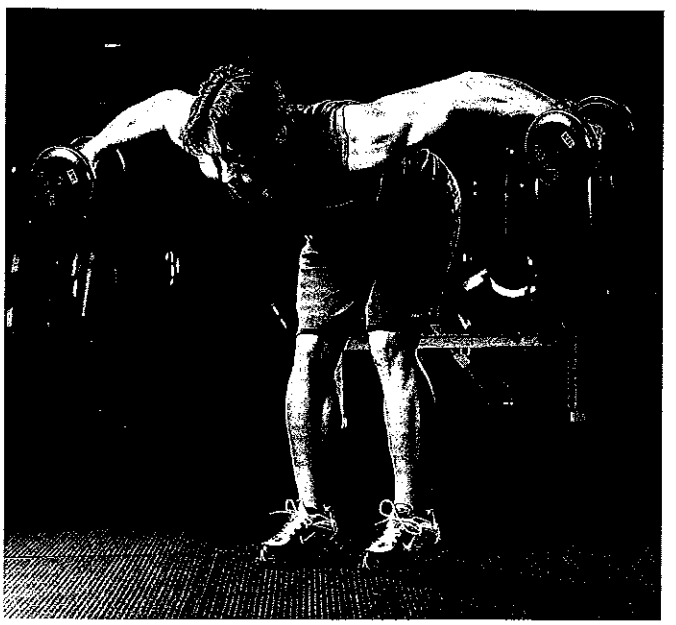
Bent-Over Lateral Raise

START

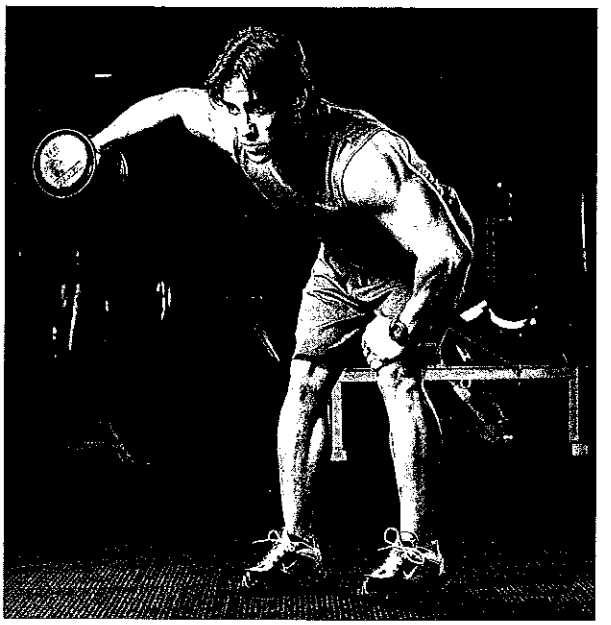
Stand with your knees slightly bent. Holding a pair of dumbbells in front of you with your palms facing toward each other, bend forward from the hips, keeping your back flat and your head up. Allow your arms to hang straight down from your shoulders and bend your elbows slightly.

MOVE

Slowly lift the dumbbells up and out to the sides of your body, pulling through the rear delts and rhomboids. Pause a moment at the top of the motion before slowly lowering the weights back down to the starting position.



One-Arm Bent-Over Lateral Raise



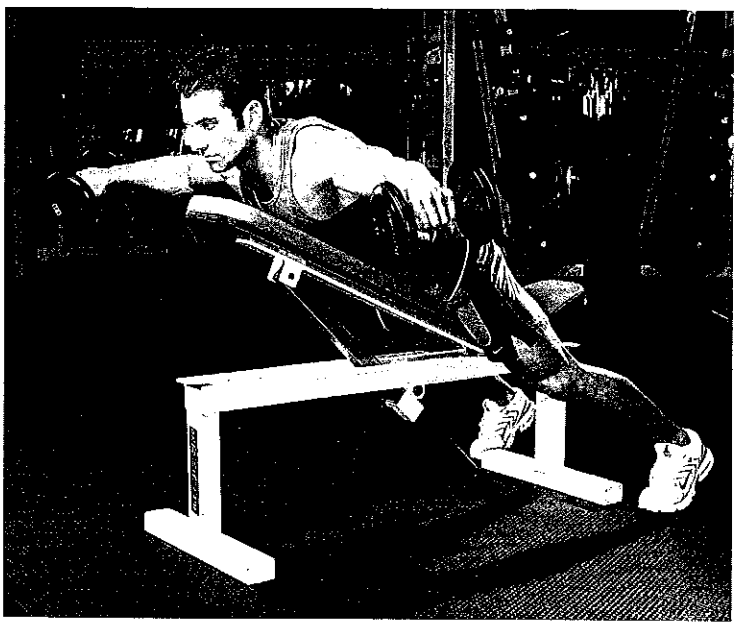
START

Lean forward at the waist, place your left hand on your thigh or a bench for support, and hold a dumbbell in your right hand with your arm extended straight down.

MOVE

Raise the weight straight out to the side until your arm is parallel with the floor. Pause a moment at the top of the motion before slowly lowering the weight back down to the starting position. Repeat with the left arm.

Incline Bench Rear Lateral Raise



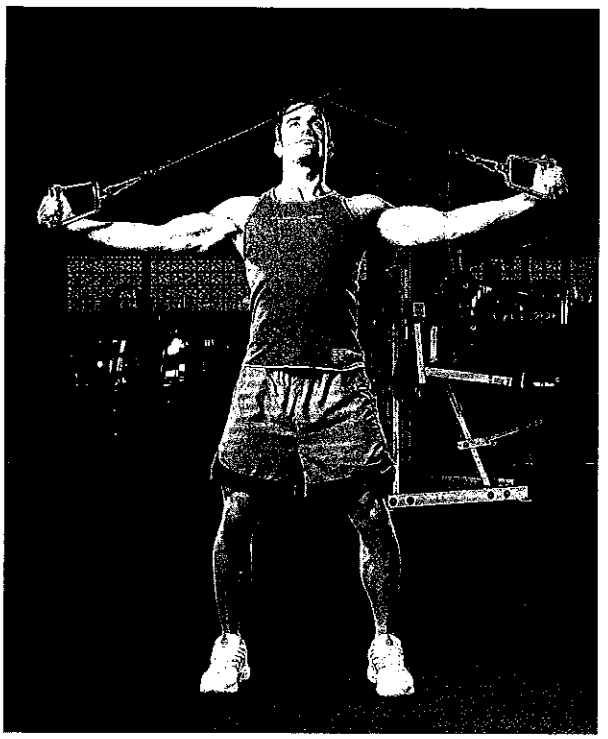
START

Sit in reverse direction straddling an incline bench set to 45 degrees while holding dumbbells with neutral grips. Your feet should be flat on the floor with your chest pressed into the bench and your chin above the top of the bench. Hold the dumbbells so that they hang straight down from your shoulders.

MOVE

Slowly lift the dumbbells up and out to the sides of your body, pulling through the rear delts and rhomboids. Pause a moment at the top of the motion before slowly lowering the weights back down to the starting position.

Standing Cable Reverse Fly



START

Stand in the center of a cable crossover apparatus. Start with hands crossed in front of you at shoulder height with the left high cable in your right hand and the right in your left hand.

MOVE

Using your rear delts, pull your elbows out and back as far as possible, then return to the starting position.

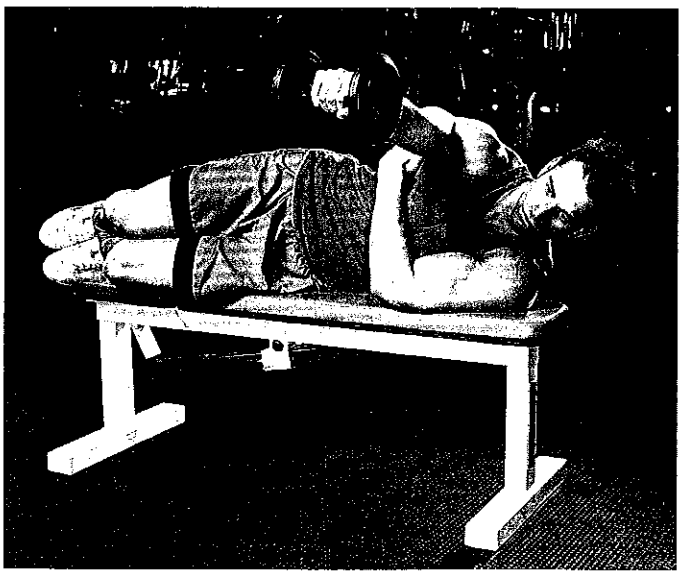
Cross-Body Rear Deltoid Raise

START

Lie on a flat bench so that one side of your body is flush against it. Position your nonworking arm so that the lower half supports your head. Position your working arm, dumbbell in hand, to hang across your body. Your elbow is slightly bent and your palm is down.

MOVE

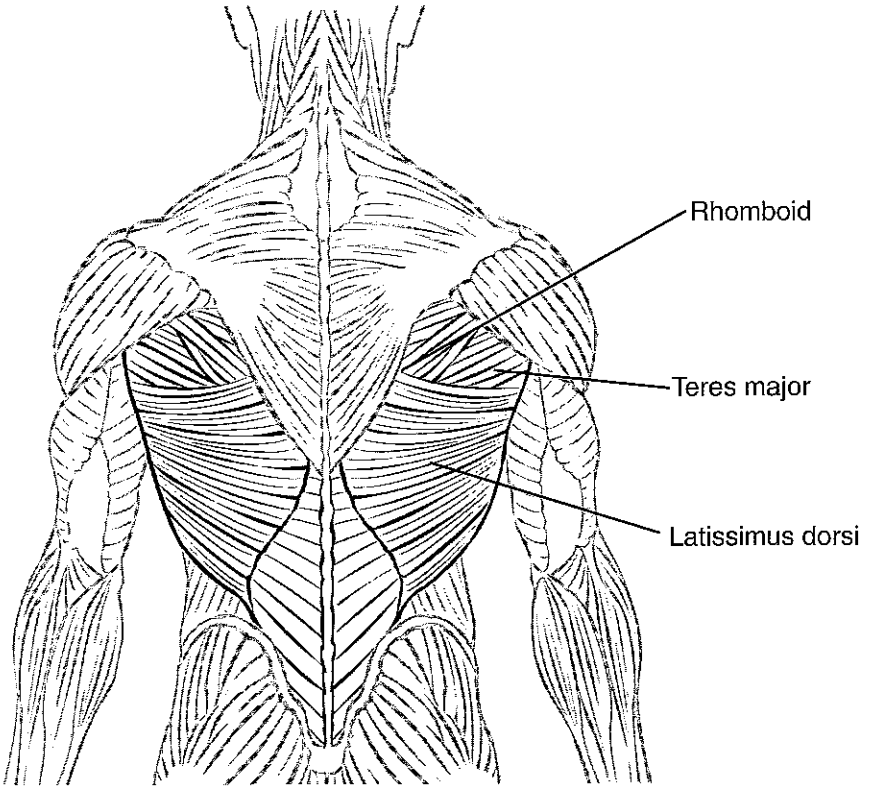
Contract your shoulder to lift the dumbbell upward. Keep your upper arm moving through the same diagonal plane throughout so that it always forms a 90-degree angle with your torso. Retrace the movement back to the starting position.



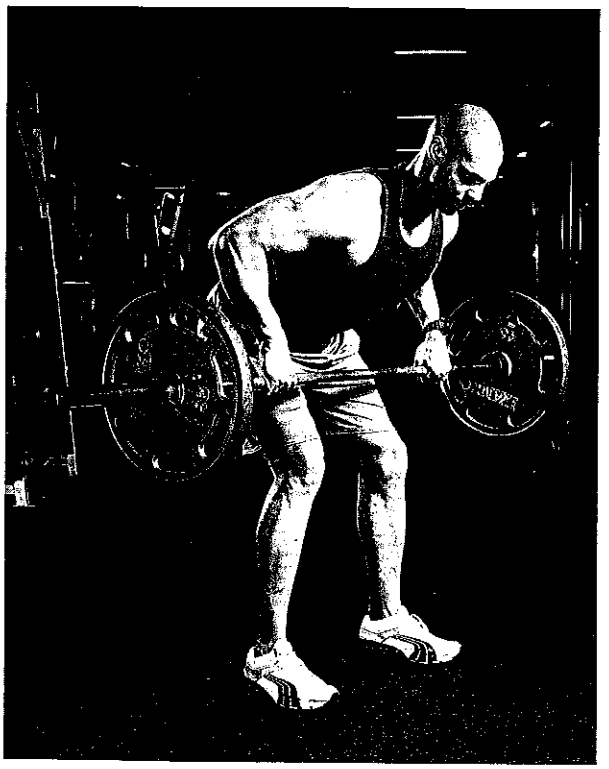
CHAPTER 13

Back

This chapter contains detailed descriptions of all major exercises that focus on the back muscles, including the latissimus dorsi (lat), teres major, rhomboids (just below the trapezius), and the deep spinal erectors. See the diagram for the location of each muscle. The back exercises are divided into barbell rowing exercises, dumbbell rowing exercises, cable and machine rowing exercises, pulldown and pull-up exercises, pullover exercises, and low-back exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Barbell Row



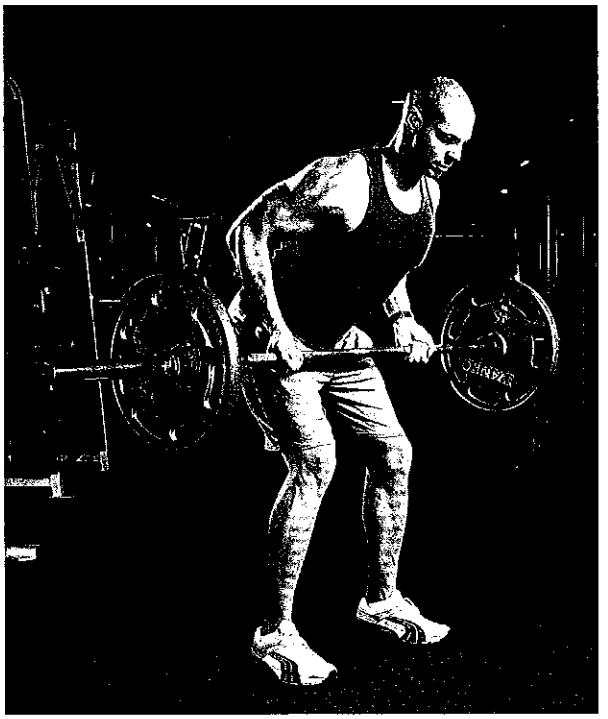
START

Stand with your feet about shoulder-width apart with a slight bend in your knees. Bend forward from the hips, keeping your torso just above parallel to the floor and your chest lifted to maintain the natural arch in your back. Take an overhand grip on the bar, hands just outside shoulder width.

MOVE

Pull the bar into your lower abs, contract your lats and middle back muscles hard, then slowly lower the bar all the way down to full arm extension.

Underhand-Grip Barbell Row



START

Stand with your feet about shoulder-width apart with a slight bend in your knees. Bend forward from the hips, keeping your torso just above parallel to the floor and your chest lifted to maintain the natural arch in your back. Take an underhand grip on the bar, hands shoulder-width apart.

MOVE

Pull the bar into your lower abs, contract your lats and middle-back muscles hard, then slowly lower the bar all the way down to full arm extension.

Supported Barbell Row

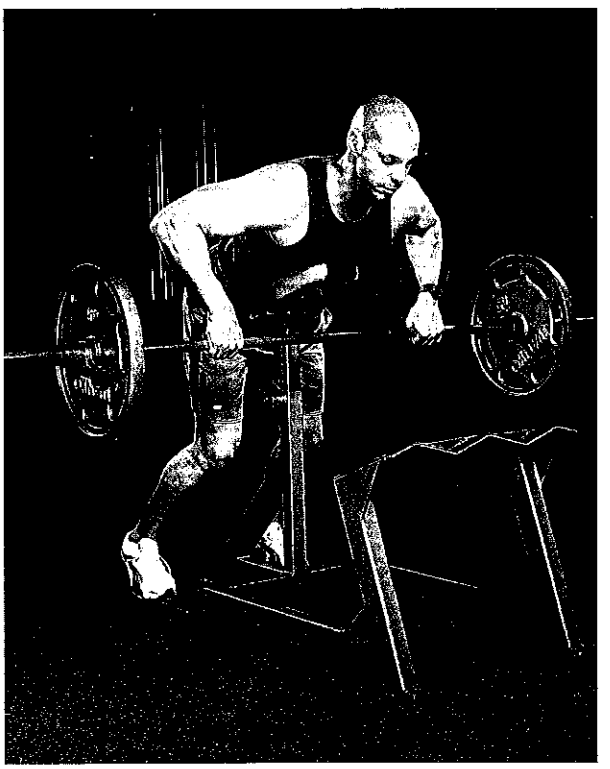
START

Adjust an incline bench so that the top of the back pad is about waist high. Stand behind the bench holding a barbell with an overhand grip just outside shoulder width. Bend forward from the hips and rest your chest on the top of the bench and let the barbell hang straight down below your shoulders. Your feet should be about shoulder-width apart and your knees should be slightly bent.

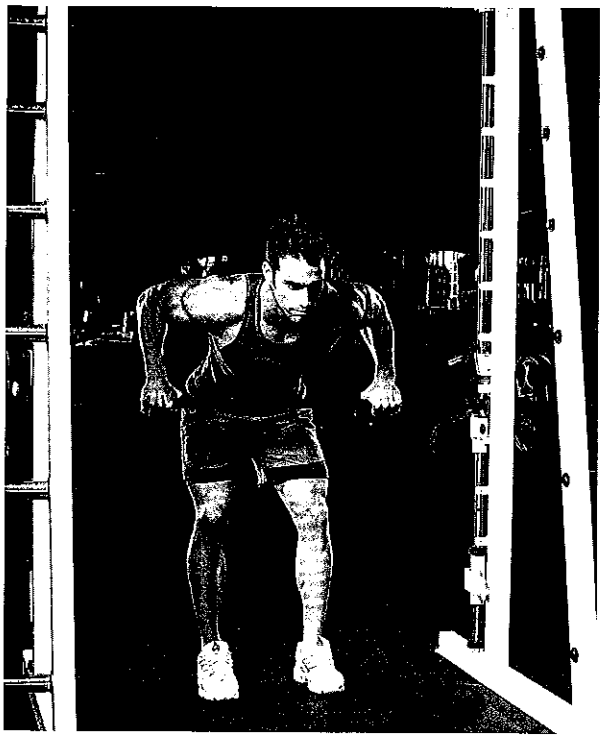
MOVE

Pull the bar in to your lower abs, contract your lats and middle-back muscles hard, then slowly lower the bar all the way down to full arm extension.

Note: You can also do this exercise with an underhand grip.



Smith Machine Bent-Over Row



START

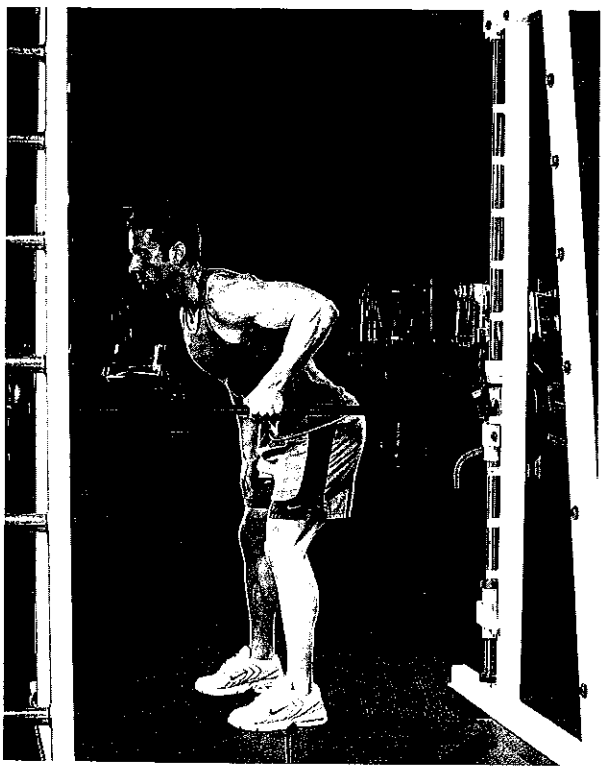
Stand in a Smith machine with the bar set on the lowest setting. Keep your feet about shoulder-width apart with a slight bend in your knees. Bend forward from the hips, keeping your torso just above parallel to the floor and your chest lifted to maintain the natural arch in your back. Take an overhand grip on the bar, hands just outside shoulder width.

MOVE

Pull the bar in to your lower abs, contract your lats and middle-back muscles hard, then slowly lower the bar all the way down to full arm extension.

Note: You can also do this exercise with an underhand grip.

Smith Machine One-Arm Bent-Over Row



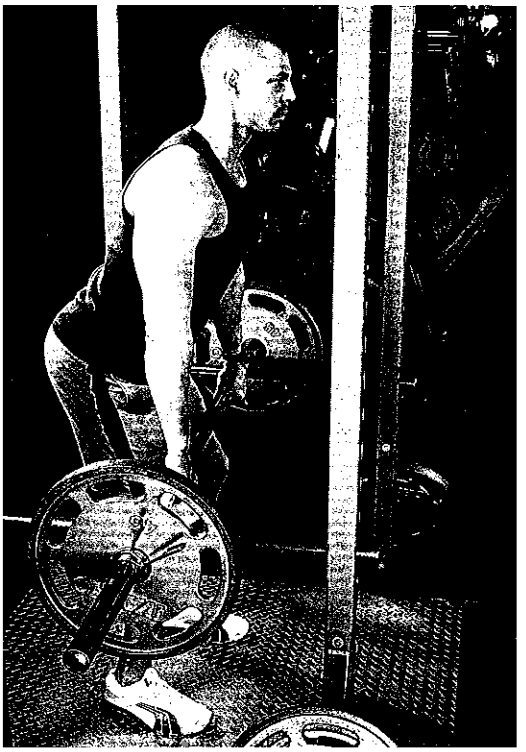
START

Stand in the middle of the Smith machine with the bar set on the lowest setting and on the side of your left leg. Keep your feet about shoulder-width apart with a slight bend in your knees. Bend forward from the hips, keeping your torso just above parallel to the floor and your chest lifted to maintain the natural arch in your back. Rest your right hand on your lower thigh for support. Grab the bar in the middle with your left hand.

MOVE

Pull the bar up as high as possible as you contract your lats and middle-back muscles hard, then slowly lower the bar all the way down to full arm extension. Repeat with the right arm.

Barbell Power Row



START

Stand in a power rack with a barbell resting on the safety pins set just above knee height. Keep your feet about shoulder-width apart with a slight bend in your knees. Bend forward from the hips, keeping your torso just above parallel to the floor and your chest lifted to maintain the natural arch in your back. Take an overhand grip on the bar, hands just outside shoulder width.

MOVE

With a fast and powerful move, pull the bar up to your waist and lower it back to the pins. Pause for several seconds with the bar on the pins before doing another rep.

Note: You can also do this exercise with an underhand grip.

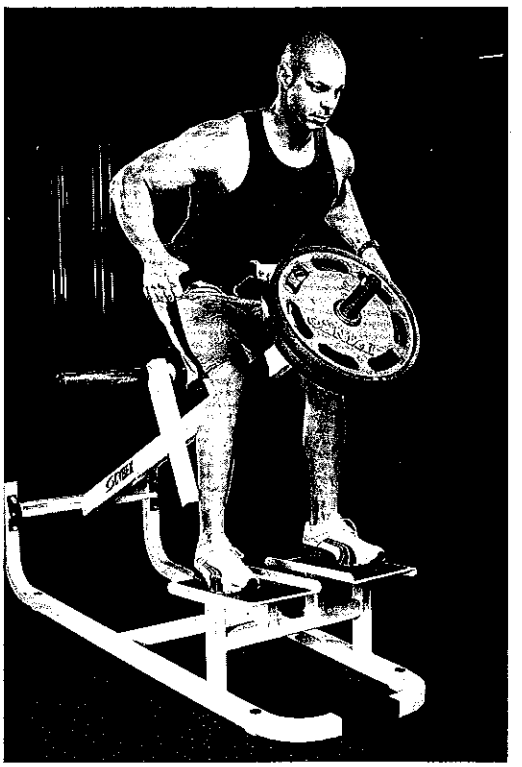
T-Bar Row

START

With your feet shoulder-width apart and your knees slightly bent, take a wide, overhand grip on the handles. Bend at the hips and keep your back arched throughout the movement.

MOVE

Pull the bar all the way to your chest and pause at the top before lowering to a full stretch at the bottom.



Supported T-Bar Row

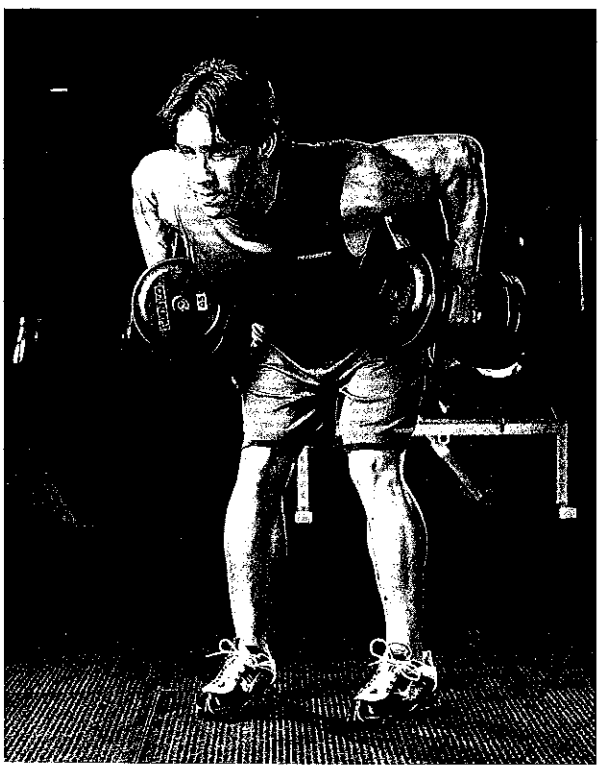
START

Lie on the pad of the T-bar row machine with your chest supported and your feet firmly planted on the foot platform. Take a wide, overhand grip on the handles and unhook the bar from the rack and support it with your arms hanging down at full extension.

MOVE

Pull the bar as high as the apparatus will allow and pause at the top before lowering to a full stretch at the bottom.

Dumbbell Row



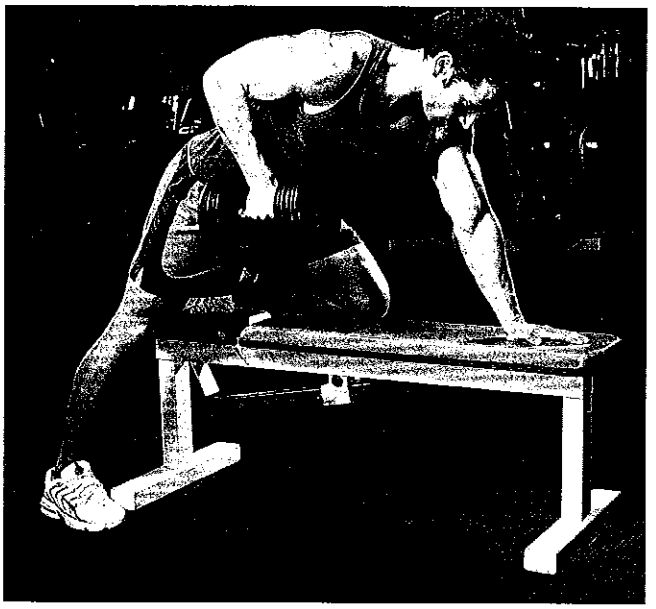
START

Holding two dumbbells with a neutral grip, stand with your feet about shoulder-width apart while maintaining a slight bend in your knees. Bend forward from the hips, keeping your torso just above parallel to the floor and your chest lifted to maintain the natural arch in your back. Allow the dumbbells to hang straight down below your shoulders.

MOVE

Pull the dumbbells to your sides as high as possible while contracting your lats and middle-back muscles hard. Then slowly lower the dumbbells all the way down to full arm extension.

One-Arm Dumbbell Row



START

Grasp a dumbbell in one hand and rest your free hand and same side leg on a bench. Keep your chest slightly lifted as you bend forward from the hips. Keep the other foot flat on the ground for balance.

MOVE

Keeping your torso stable throughout the movement, pull the dumbbell all the way up to your side, lifting your elbow as high as possible. Then lower the dumbbell straight down to the starting position.

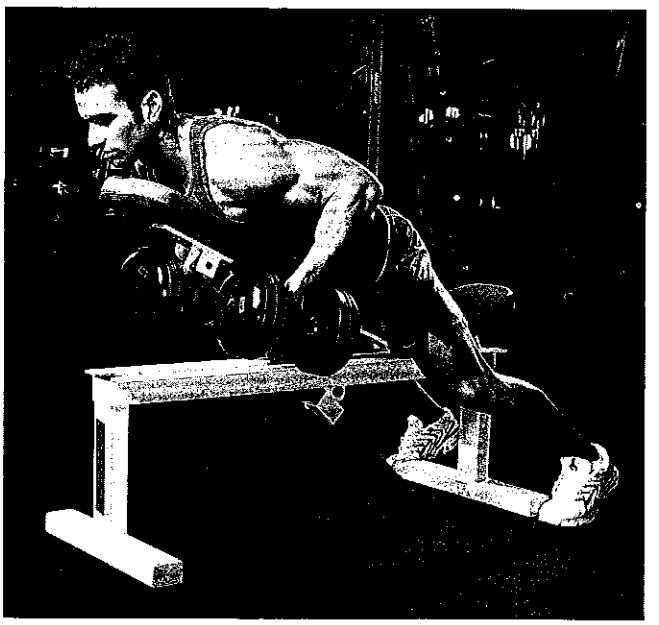
Incline Dumbbell Row

START

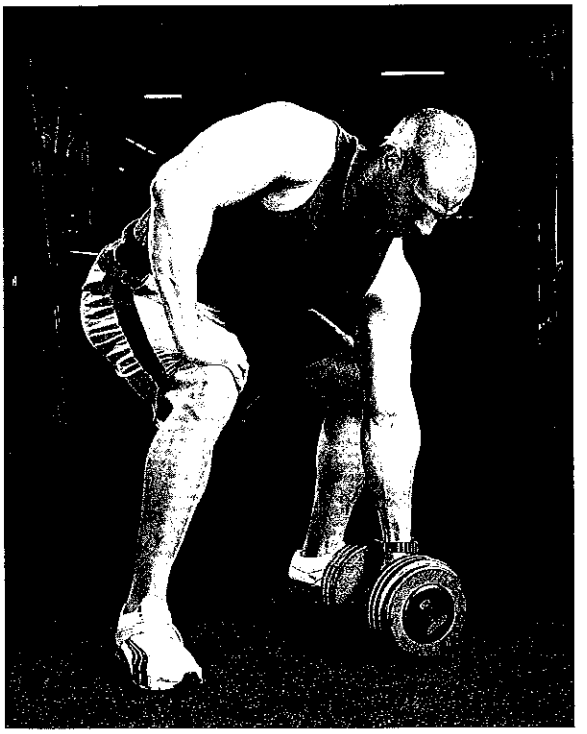
Grasp a dumbbell in each hand and straddle an incline bench set to 45 degrees. Your chest should be supported by the bench with your chin above the top. Let the dumbbells hang directly below your shoulders.

MOVE

With your palms facing each other and your elbows close to your body, pull the weights as high as possible, squeezing your shoulder blades together at the top.



Dumbbell Power Row



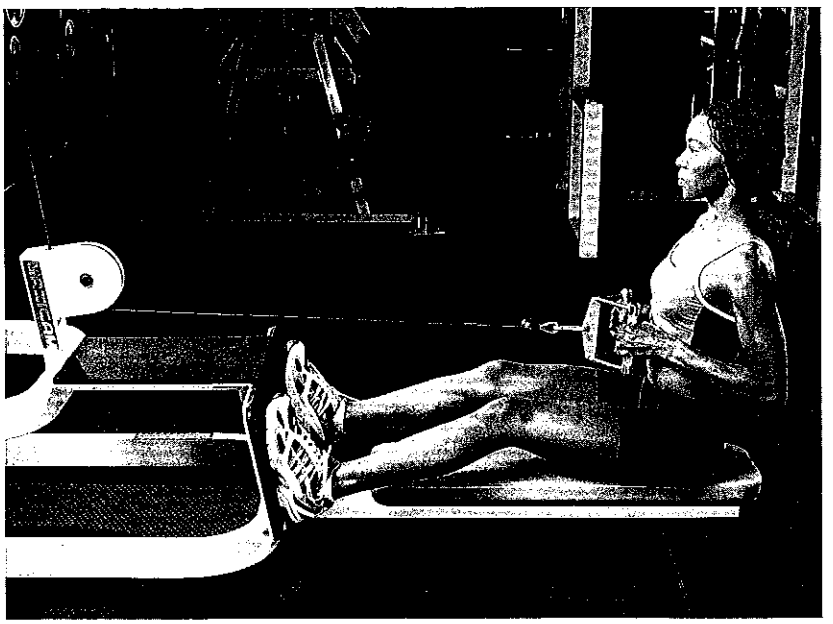
START

Place a dumbbell on the floor between your feet. Your legs should be about shoulder-width apart and your knees should be bent so that your thighs are just above parallel with the floor. With your left arm, grasp the dumbbell with an overhand grip and place your right hand firmly above your right knee to brace your upper body. Keep your torso at about a 45-degree angle to the floor throughout the exercise.

MOVE

Start the movement by forcefully extending your knees to lift the dumbbell from the floor, and then pull the dumbbell up toward your left hip by pulling your elbow as high as possible. Your grip should turn so that when the dumbbell is at the top your palm is facing your torso (neutral grip). Slowly lower the dumbbell back to the floor in the opposite manner you lifted it. After finishing the desired number of reps, repeat on the right side.

Seated Cable Row



START

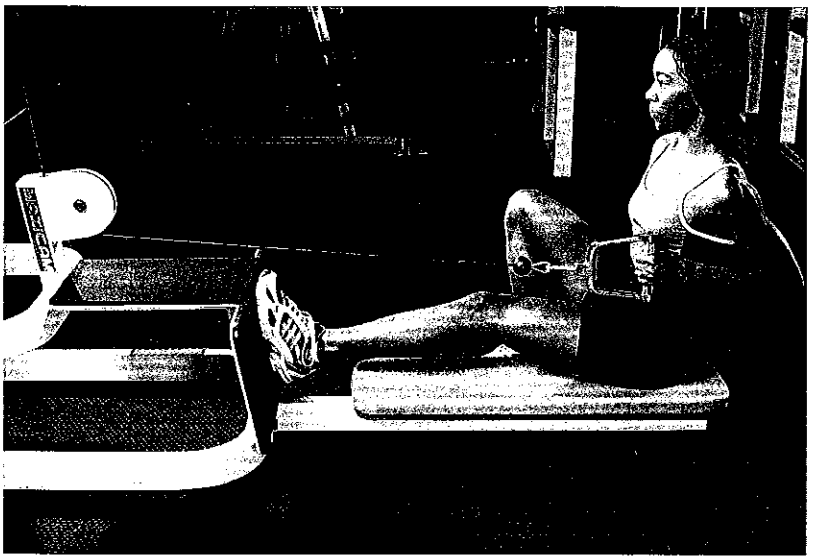
Sit on the cable row bench with your feet firmly planted on the foot plate. Grab a low row bar attached to the cable pulley. Keep your knees slightly bent and your back straight. Maintain a slight arch in your low back and keep your chest out.

MOVE

Pull the handle toward your mid-section, focusing on driving your elbows back until the handle touches your lower abdomen. After squeezing your shoulder blades together at the peak of contraction, slowly return to the starting position.

Note: You can do this exercise with an overhand or underhand grip on a lat bar.

One-Arm Seated Cable Row



START

Sit on the cable row bench so that your left leg is supported on the bench and your left foot is firmly planted on the foot platform. Your right leg should be bent and firmly planted on the floor. Grab a single-handle D-grip attached to the cable pulley. Keep your left knee slightly bent and your back straight. Maintain a slight arch in your lower back and keep your chest out.

MOVE

Pull the handle toward your side, focusing on driving your elbow back as far as possible. Slowly return to the starting position. After completing the desired number of reps, repeat on the right side.

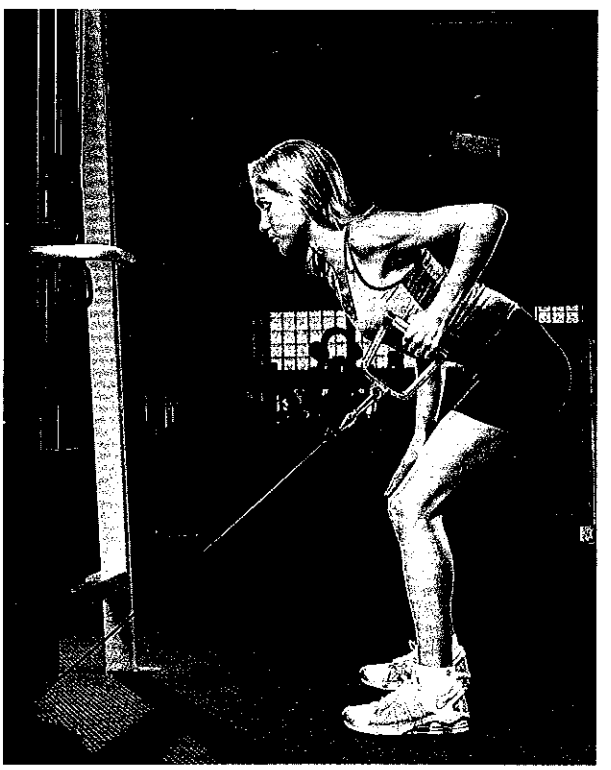
One-Arm Bent-Over Cable Row

START

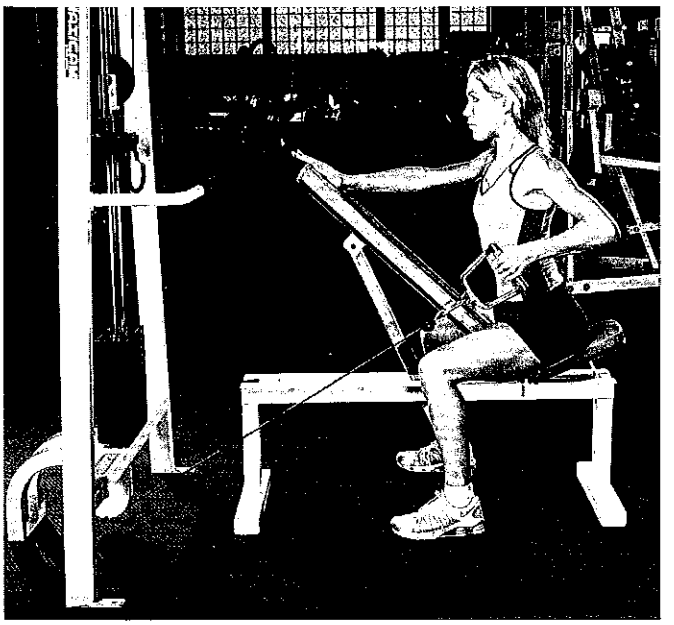
Grasp a single-handle D-grip attached to a low pulley with your left palm facing your body. Grasp the support bar with your right hand to stabilize yourself. Lean forward about 45 degrees. Use a split stance: The left foot should be back while the right is forward. Keep your chest up and shoulders squared. Maintain a slight arch in your back.

MOVE

Pull the handle in to the left side of your waist until your elbow is past your body. When you return to the starting position, go for a deep stretch. Compete the desired number of reps and repeat on the right side.



Reverse Incline Bench One-Arm Cable Row



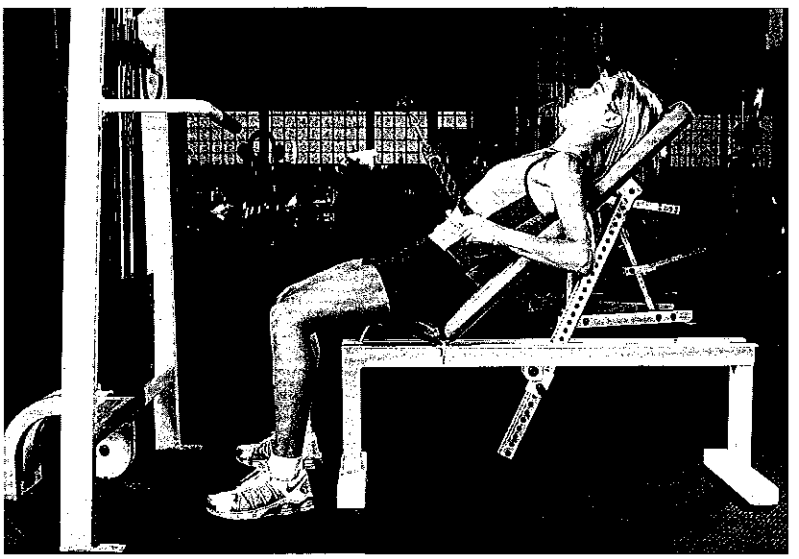
START

Place an incline bench next to a pulley apparatus so that the higher end is near the low pulley and to the right. Set the angle at about 30 to 45 degrees. Grasp the single-handle D-grip attachment attached to the low pulley. Sit straddling the bench and facing the weight stack. Lean against the bench to support your chest while extending your arm straight forward with a neutral grip.

MOVE

Pull on the handle, moving your elbow straight back as far as possible. Squeeze your shoulder blades together as you contract your lats briefly before returning to the starting position.

Incline Bench Cable Row From High Pulley



START

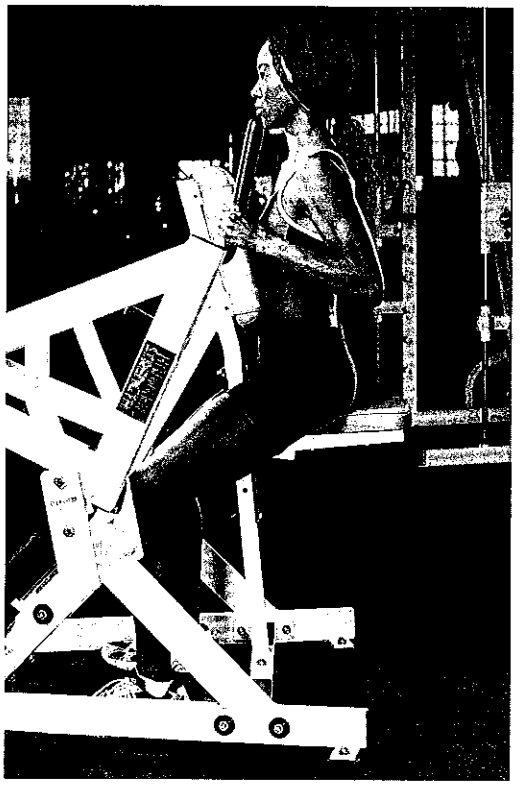
Place an incline bench (set to 45 degrees) about a foot from a high-pulley cable apparatus. Grab a lat bar attached to the high pulley and sit down on the bench. Your feet are flat on the floor and your back is flat against the bench. Extend your arms in front of you so that they follow the line of the cable.

MOVE

Pull the handle to your abdomen as you squeeze your shoulder blades together. Contract your lats briefly before returning the bar to the starting position.

Note: You can do this exercise with a low row bar or a rope attachment, and you can do it unilaterally using a single-handle D-grip attachment.

Machine Row



START

Adjust the seat of the machine row so that your arms are parallel to the floor when you grab the handles. Adjust the chest pad so that the weight plates do not touch the bottom of the stack when you hold the handles with full arm extension. With your feet flat on the floor, keep your chest pressed against the chest pad while keeping your back straight.

MOVE

Pull the handles toward your ribs, bringing your elbows back as far as possible as you squeeze your shoulder blades together and you contract your lats briefly. Slowly return the handle to the starting position with your arms fully extended.

Note: You can also do this exercise unilaterally.

Pull-Up

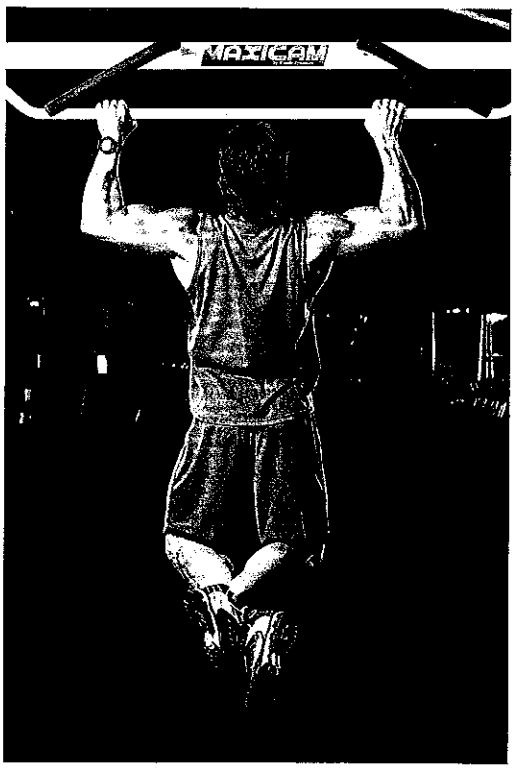
START

Using an overhand grip, grab on to a chin-up bar with your hands spaced wider than shoulder-width apart. Hang from the bar with your arms fully extended and your chest high while exaggerating the arch in your lower back.

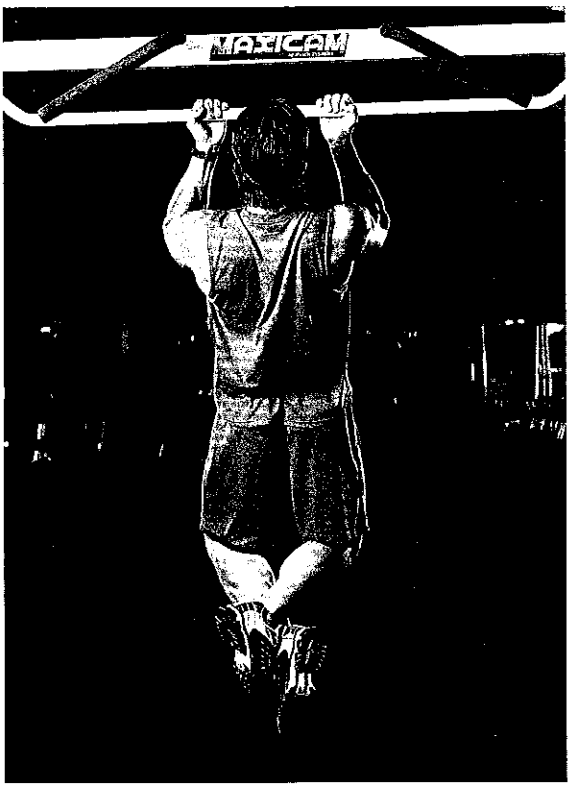
MOVE

Pull yourself up by squeezing your shoulder blades together and contracting your lats until your chin passes the bar. Hold the contraction at the top for a second before slowly lowering yourself back to the starting position.

Note: You can do this exercise with the hands closer together on the bar.



Chin-Up



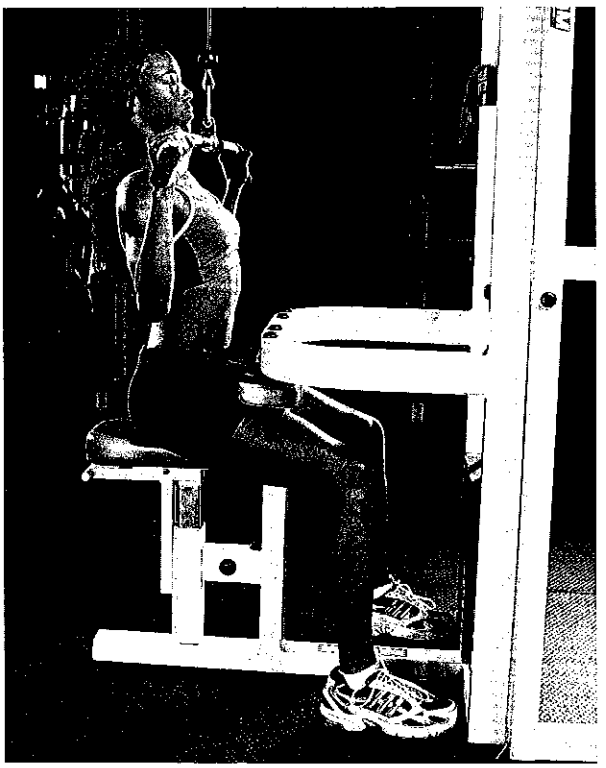
START

Using an underhand grip, grab on to a chin-up bar with your hands spaced shoulder-width apart. Hang from the bar with your arms fully extended and your chest high while exaggerating the arch in your low back.

MOVE

Pull yourself up by squeezing your shoulder blades together and contracting your lats until your chin passes the bar. Hold the contraction at the top for a second before slowly lowering yourself back to the starting position.

Lat Pulldown



START

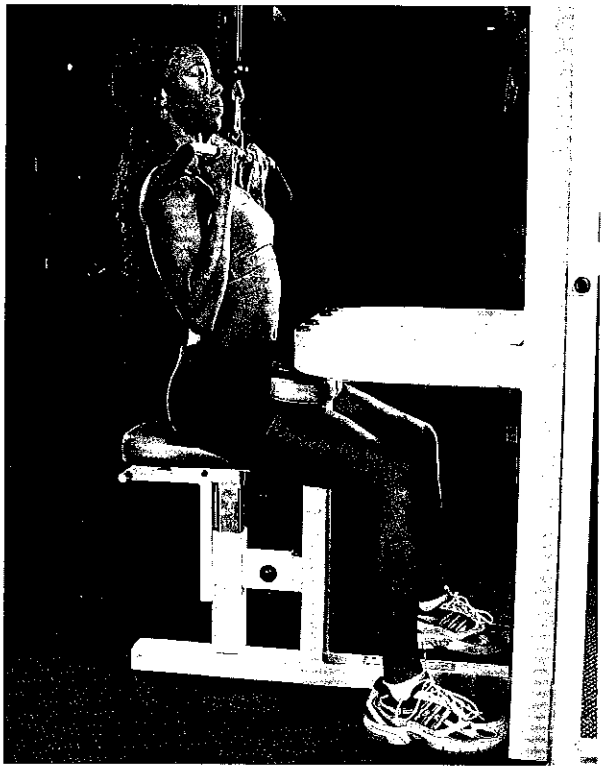
Take an overhand grip that is wider than shoulder width on a lat bar attached to the pulley on the lat pulldown apparatus. Position yourself on the seat with your feet flat on the floor, arms extended overhead, chest up, and low-back arch exaggerated.

MOVE

Pull your shoulder blades together as you squeeze your lats to initiate the movement, pulling the bar down in a smooth motion to your upper chest. Hold the contraction for a moment, then slowly return the bar all the way back to the starting position.

Note: You can do this exercise with the hands closer together on the bar.

Reverse-Grip Pulldown



START

Take an underhand grip with your hands spaced about shoulder-width on a lat bar or straight bar attached to the pulley on the lat pulldown apparatus. Position yourself on the seat with your feet flat on the floor, arms extended overhead, chest up, and low-back arch exaggerated.

MOVE

Pull your shoulder blades together as you squeeze your lats to initiate the movement, pulling the bar down in a smooth motion to your chest. Hold the contraction for a moment, then slowly return the bar all the way back to the starting position.

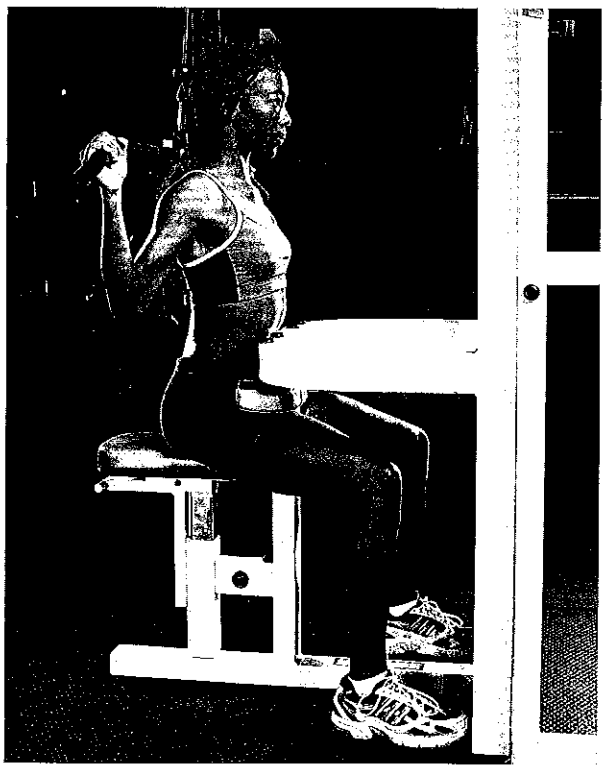
Behind-the-Neck Pulldown

START

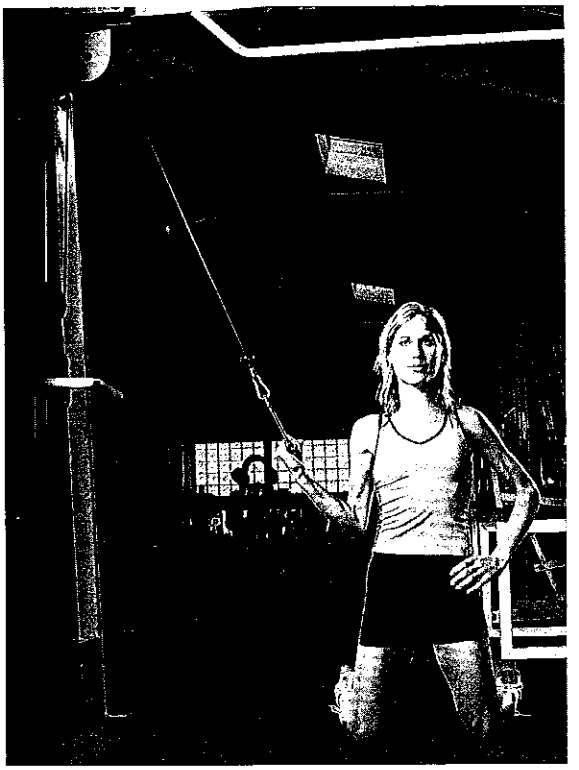
Take an overhand grip that is wider than shoulder width on a lat bar attached to the pulley on the lat pulldown apparatus. Position yourself on the seat with your feet flat on the floor, arms extended overhead, and back leaning slightly forward.

MOVE

Pull your shoulder blades together as you squeeze your lats to initiate the movement, pulling the bar down in a smooth motion to the back of your neck. Hold the contraction for a moment, then slowly return the bar all the way back to the starting position.



One-Arm Pulldown



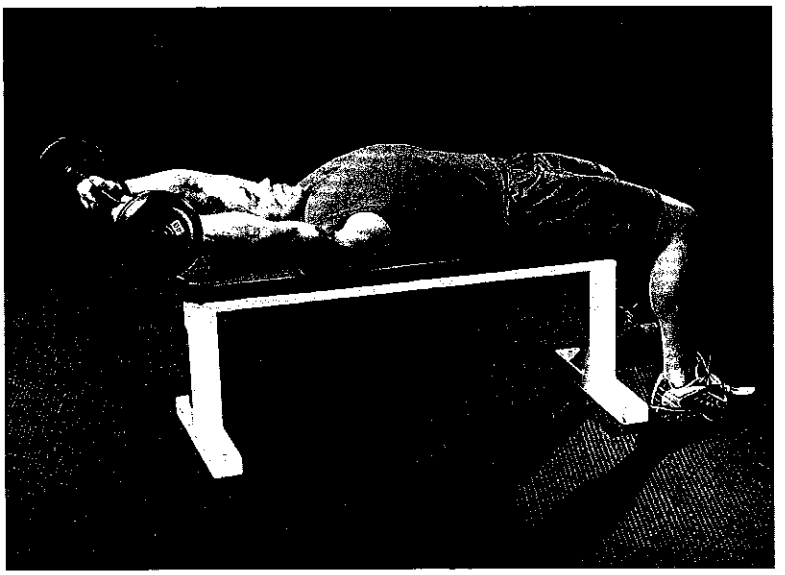
START

Kneel about a foot (30.5 centimeters) away from a high-pulley cable with your right side lined up with the pulley. Grab the single-handle D-grip with your right hand so that your palm faces forward and your arm is extended up and toward the pulley.

MOVE

Pull the handle down to the outside of your right shoulder, bringing your elbow down toward your hip. Hold the contraction for a second before returning the handle to the starting position.

Straight-Arm Pullover



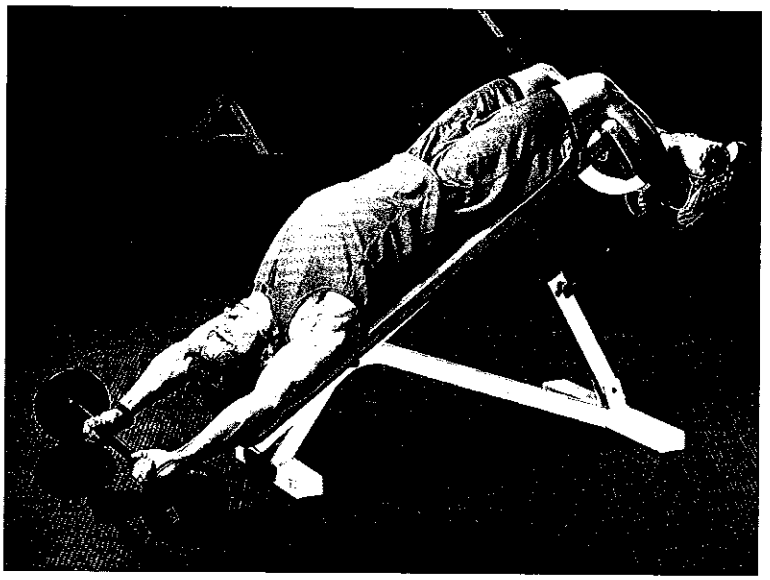
START

Lie on a flat bench with your feet flat on the floor and your head close to the end of the bench. Hold a straight bar or EZ curl bar with an overhand grip spaced shoulder-width apart and arms extended straight over your chest. Maintain a slight bend in your elbows throughout the entire exercise.

MOVE

Lower your arms back and down over your head until they are just below parallel to the floor. Pull the bar back up with straight arms until the bar is back over your chest.

Straight-Arm Decline Bench Pullover



START

Lie on a decline bench with your feet secured under the foot pads and your head close to the end of the bench. Hold a straight bar or EZ curl bar with an overhand grip spaced shoulder-width apart and arms extended straight up over your abs. Maintain a slight bend in your elbows throughout the entire exercise.

MOVE

Lower your arms back and down over your head as far as possible, then pull the bar back up with straight arms until the bar is back over your abs.

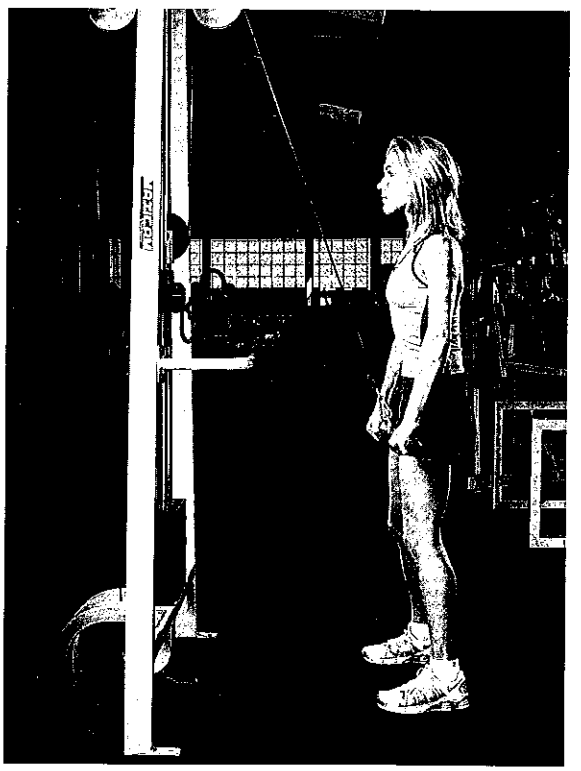
Straight-Arm Pulldown

START

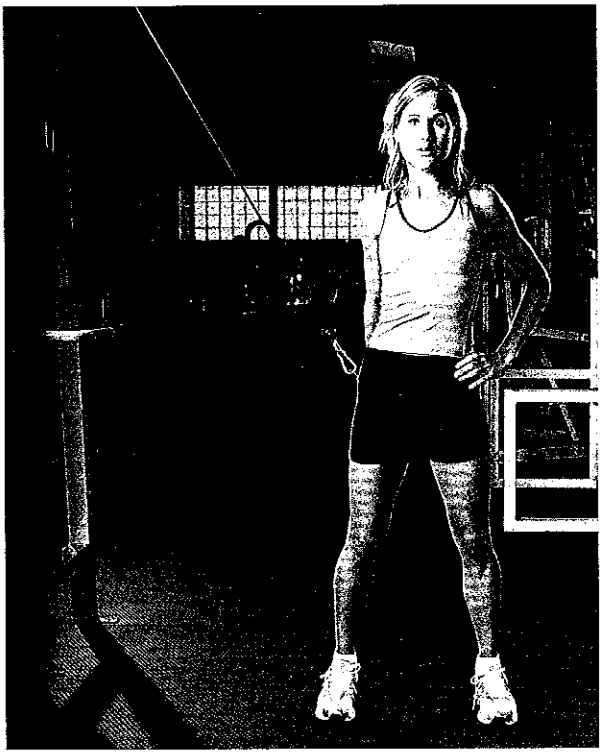
Stand behind the bench of a lat pulldown apparatus with your feet shoulder-width apart and knees slightly bent. Grab the lat bar with an overhand grip and your arms shoulder-width apart. In this position your arms should be extended straight out in front of you, forming about a 45-degree angle to the floor.

MOVE

Pull your arms down to bring the bar to your upper thighs while maintaining a slight bend in your elbows. Squeeze your lats hard in this position and slowly return the bar back to the starting position.



One-Arm Straight-Arm Pulldown



START

Stand about a foot (30.5 to 61 centimeters) or two away from a high-pulley cable so that your right arm is lined up with the pulley. Your feet should be shoulder-width apart and your knees slightly bent. Grab a single-handle D-grip with an overhand grip. In this position your arm should be extended straight out in front of you, forming about a 45-degree angle to the floor.

MOVE

Pull your arm down to bring the handle to the side of your thigh while maintaining a slight bend in your elbow. Hold the contraction for a second before slowly returning the handle back to the starting position. Perform the desired number of reps and repeat on the left side.

Dumbbell Straight-Arm Pullback

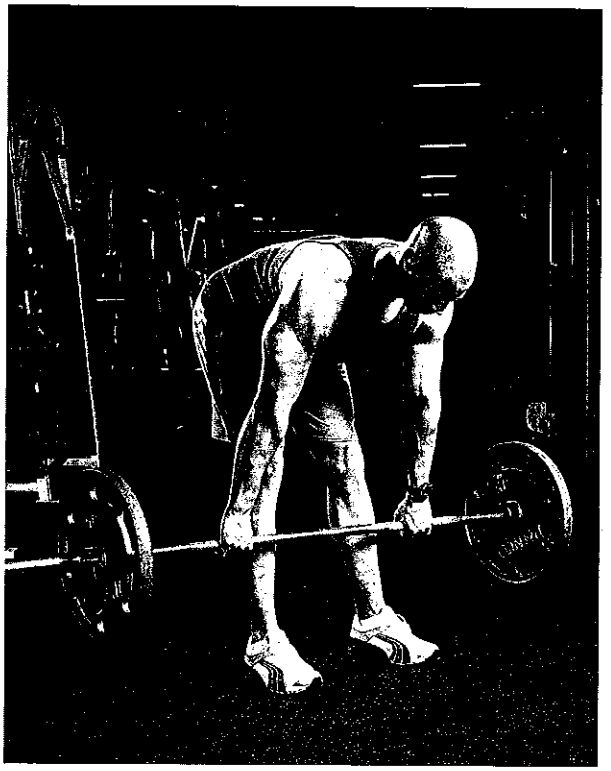
START

Stand with your knees slightly bent and shoulder-width apart. Hold a dumbbell in your left hand with an overhand grip. Bend over from the hips until your back is just above parallel with the floor. Place your right hand on your lower thigh for support. Let the dumbbell hang straight down below your shoulder.

MOVE

Maintaining a straight arm, pull your arm back and up to your side until it is parallel with the floor. Then slowly return your arm to the starting position. Repeat with the right arm.

Stiff-Leg Deadlift



START

Stand with feet shoulder-width apart. With hands in an overhand grip and spaced shoulder-width apart, hold a loaded barbell in front of your thighs.

MOVE

Bend over at the waist as you lower the bar in front of your legs down toward your ankles. Pause briefly before lifting your torso back up to a standing position.

Note: This exercise is different from the Romanian deadlift, which uses more movement at the hips than at the lower back and involves the hamstrings and glutes as the primary movers.

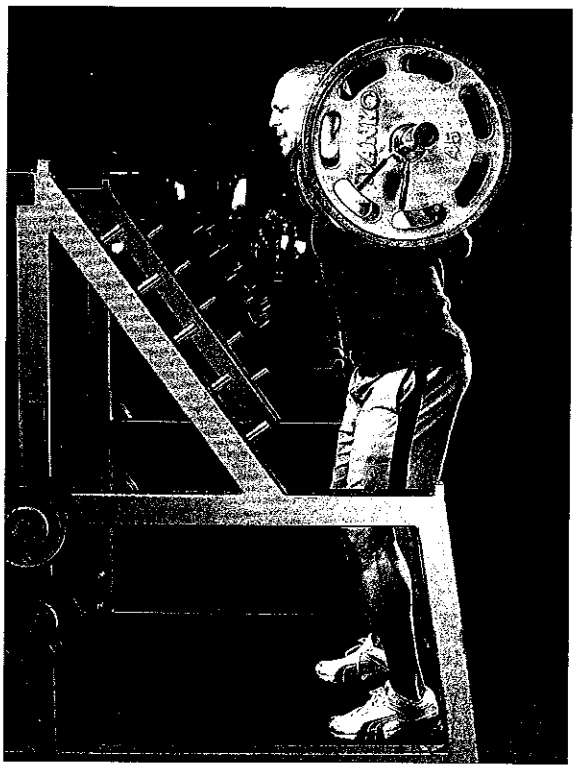
Barbell Good Morning

START

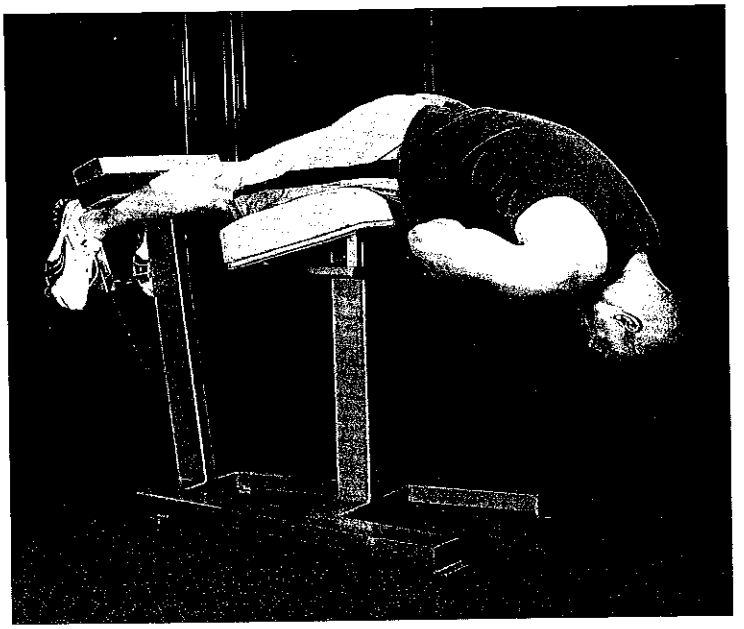
Stand with a barbell resting across your traps in a shoulder-width grip.

MOVE

Keeping your knees slightly bent, lean forward at the waist until your torso is almost parallel to the ground. Return to the starting position.



Back Extension



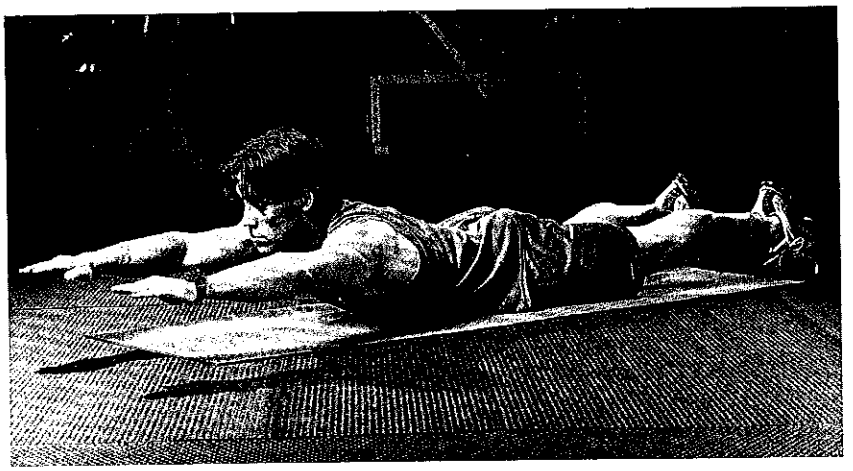
START

Lie facedown on a back extension bench with your heels under the footpads and your hips resting on the bench. Keep your body straight and your hands crossed over your chest.

MOVE

Lower your torso by bending at the waist to form an angle at your hips that approaches about 90 degrees. Use a smooth motion to rise back up to the starting position.

Lying Back Extension



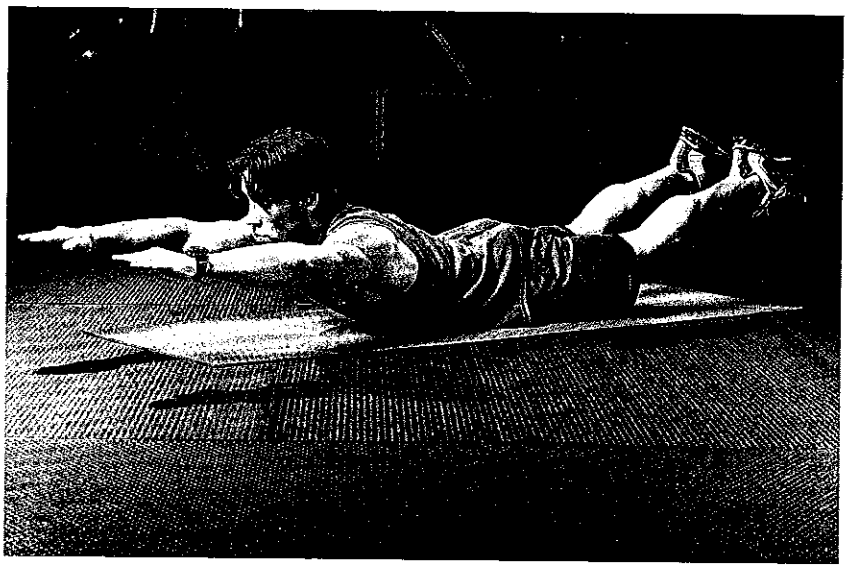
START

Lie facedown on the floor with your arms extended in front of you.

MOVE

Raise your chest, shoulders, and arms off the floor as high as possible and hold for the desired amount of time.

Superman Back Extension



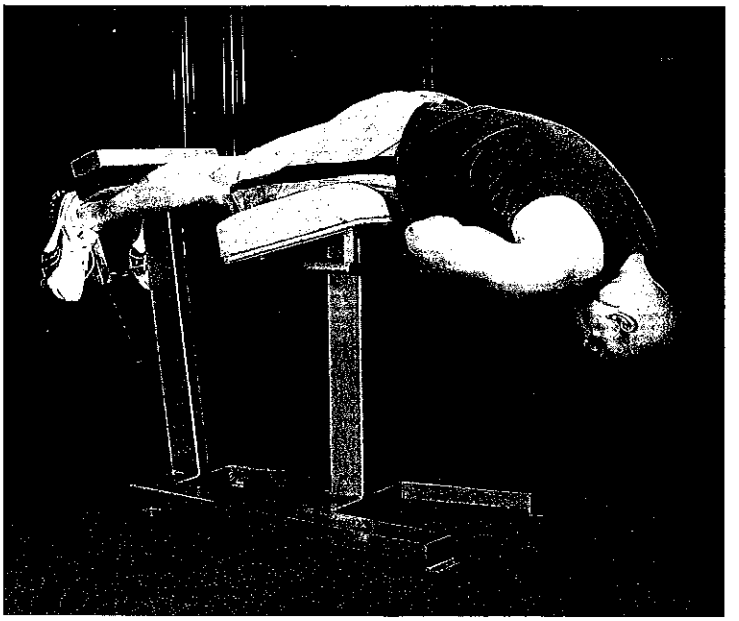
START

Lie facedown on the floor with your arms extended in front of you.

MOVE

Simultaneously raise your chest, shoulders, arms, and legs off the floor as high as possible and hold for the desired amount of time.

Back Extension



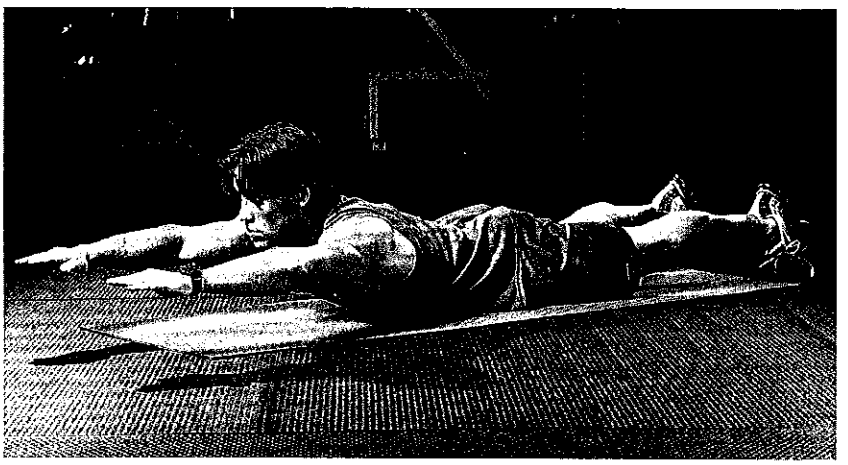
START

Lie facedown on a back extension bench with your heels under the footpads and your hips resting on the bench. Keep your body straight and your hands crossed over your chest.

MOVE

Lower your torso by bending at the waist to form an angle at your hips that approaches about 90 degrees. Use a smooth motion to rise back up to the starting position.

Lying Back Extension



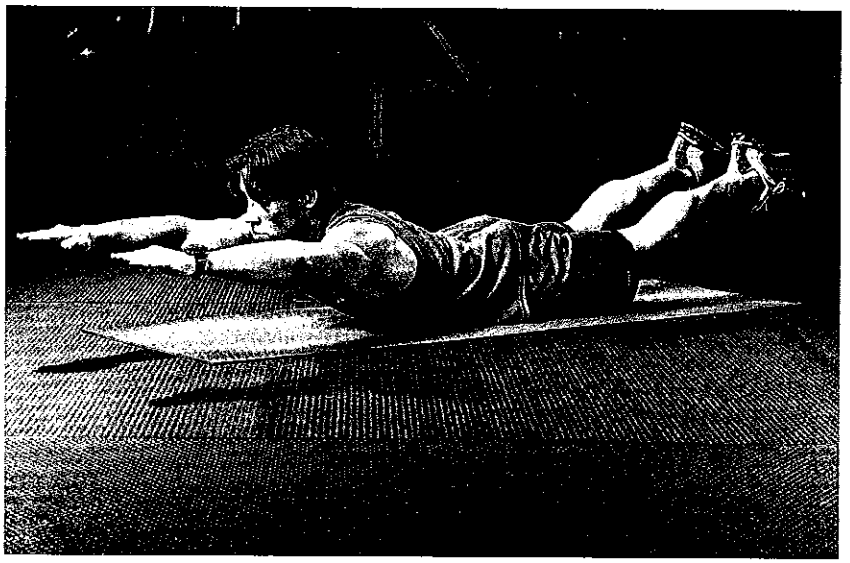
START

Lie facedown on the floor with your arms extended in front of you.

MOVE

Raise your chest, shoulders, and arms off the floor as high as possible and hold for the desired amount of time.

Superman Back Extension



START

Lie facedown on the floor with your arms extended in front of you.

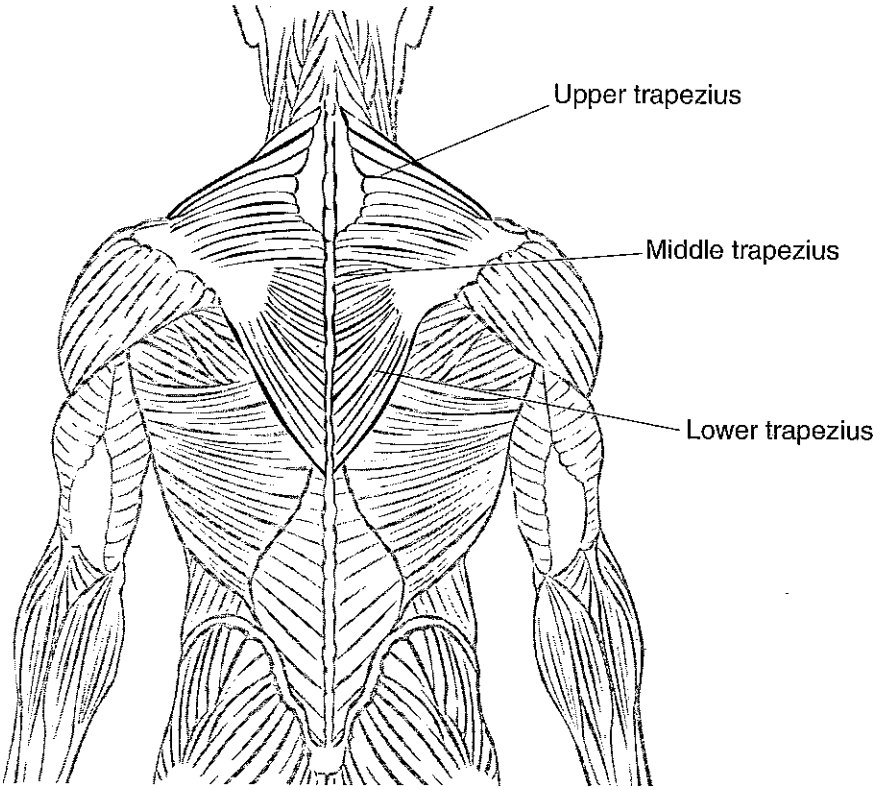
MOVE

Simultaneously raise your chest, shoulders, arms, and legs off the floor as high as possible and hold for the desired amount of time.

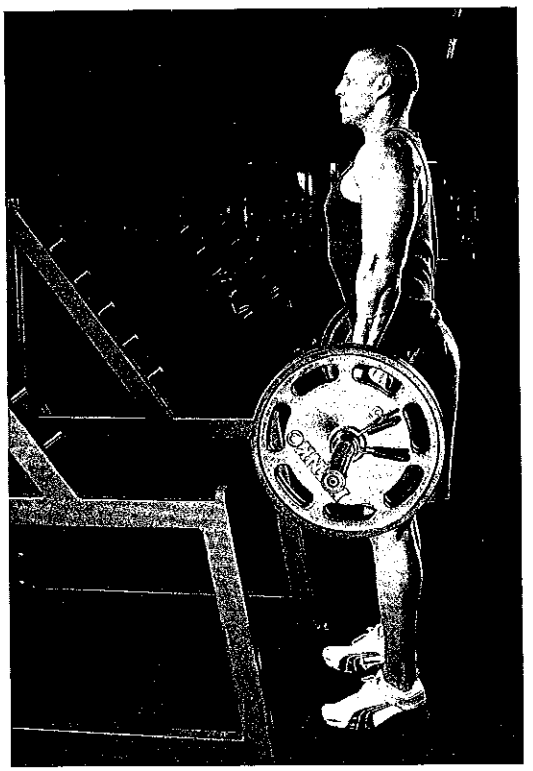
CHAPTER 14

Trapezius

This chapter contains detailed descriptions of all major exercises that focus on the trapezius (trap) muscles, including the upper-, middle-, and lower-trapezius muscle fibers. See the diagram below for a detailed location of each of these areas of the trapezius muscle. The traps exercises are divided into barbell shrugging exercises, dumbbell shrugging exercises, cable shrugging exercises, and lower-trapezius exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Barbell Shrug



START

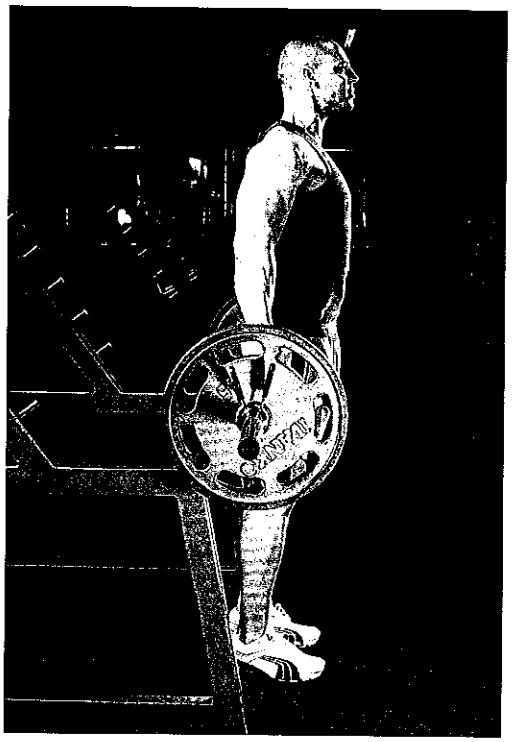
Stand while holding a barbell with an overhand grip in front of your thighs. Both your hands and your feet should be shoulder-width apart.

MOVE

Lift your shoulders up toward your ears as high as possible while keeping your arms straight. Hold the contraction for a second before lowering the bar back to the starting position.

Note: You can do this exercise with a staggered grip (one hand using an overhand grip and the other using an underhand grip).

Behind-the-Back Barbell Shrug



START

Stand while holding a barbell with an overhand grip behind your thighs. Both your hands and your feet should be shoulder-width apart.

MOVE

Lift your shoulders up toward your ears as high as possible while keeping your arms straight. Hold the contraction for a second before lowering the bar back to the starting position.

Smith Machine Shrug

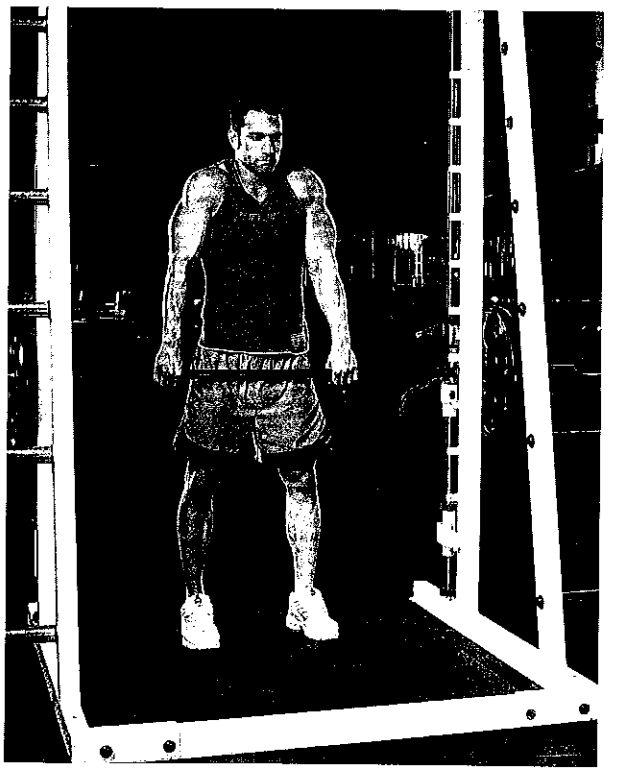
START

Stand in a Smith machine holding the unlatched bar with an overhand grip in front of your thighs. Both your hands and your feet should be shoulder-width apart.

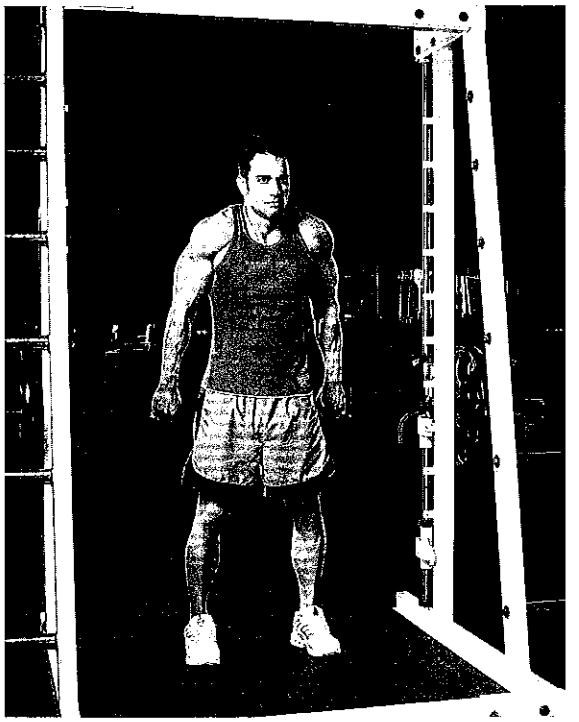
MOVE

Lift your shoulders up toward your ears as high as possible while keeping your arms straight. Hold the contraction for a second before lowering the bar back to the starting position.

Note: You can do this exercise with a staggered grip (one hand using an overhand grip and the other using an underhand grip).



Smith Machine Behind-the-Back Shrug



START

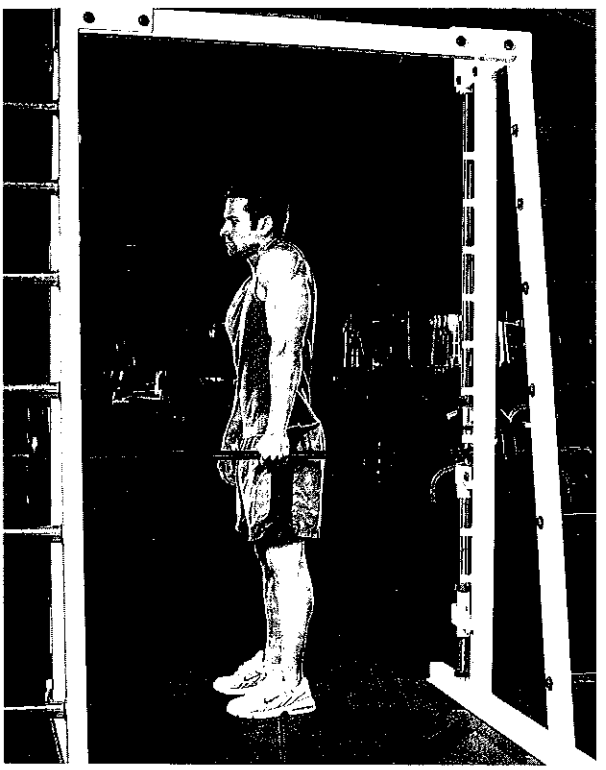
Stand in a Smith machine holding the unlatched bar with an overhand grip in back of your thighs. Both your hands and your feet should be shoulder-width apart.

MOVE

Lift your shoulders up toward your ears as high as possible while keeping your arms straight. Hold the contraction for a second before lowering the bar back to the starting position.

Note: You can do this exercise with a staggered grip (one hand using an overhand grip and the other using an underhand grip).

Smith Machine One-Arm Shrug



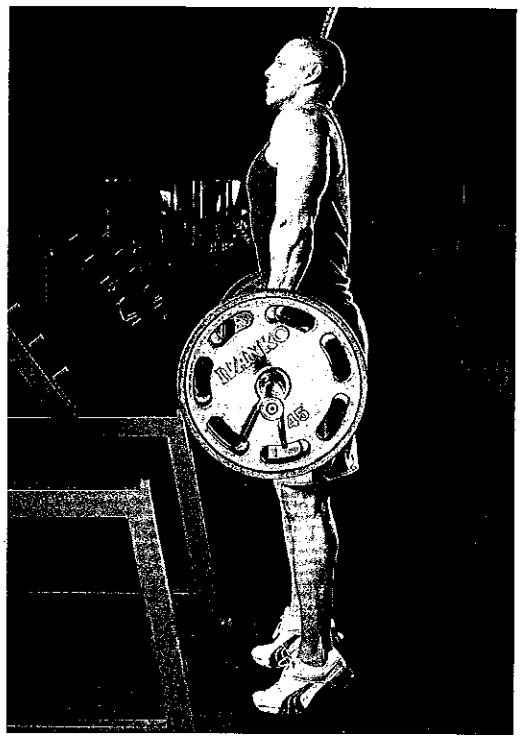
START

Stand in a Smith machine with your left side toward the bar. With your feet shoulder-width apart and your knees slightly bent, grab the bar in the middle with your left hand and unlatch it.

MOVE

Lift your shoulder up toward your ear as high as possible while keeping your arm straight. Hold the contraction for a second before lowering the bar back to the starting position. Complete the desired number of reps and repeat on the right side.

Barbell Power Shrug



START

Stand while holding a barbell with an overhand grip in front of your thighs. Both your hands and your feet should be shoulder-width apart.

MOVE

Quickly bend down a little at the knees and immediately reverse that motion, exploding up with your thighs and calves while simultaneously shrugging your shoulders up toward your ears as high as possible while keeping your arms straight. Immediately lower the weight back to the starting position.

Note: You can do this exercise with a staggered grip (one hand using an overhand grip and the other using an underhand grip).

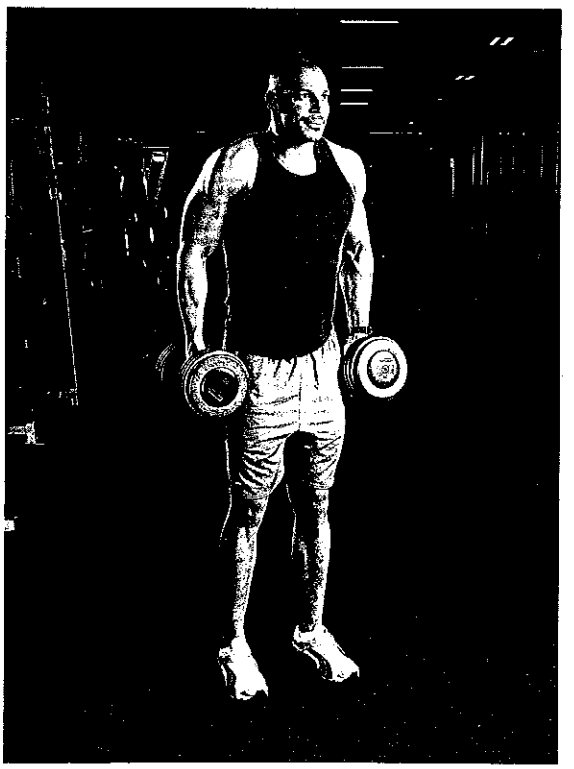
Dumbbell Shrug

START

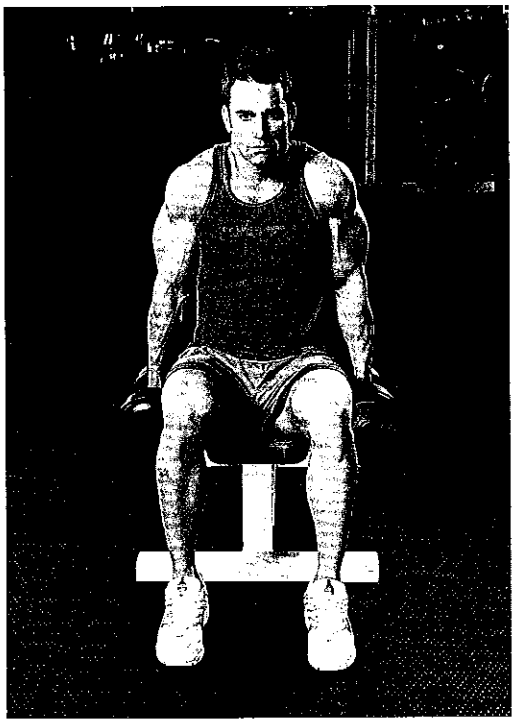
Stand with feet shoulder-width apart while holding a pair of dumbbells at your sides.

MOVE

Slowly shrug your shoulders up toward your ears. At the top, pause for a moment and contract hard through your traps and rhomboids before slowly lowering the weights back to the starting position.



Seated Dumbbell Shrug



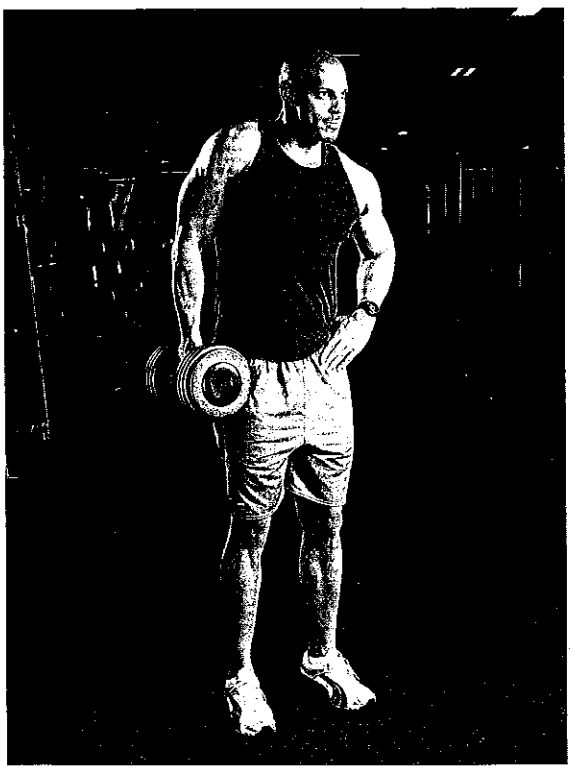
START

Sit on a flat bench with your feet flat on the floor in front of you. Hold a pair of dumbbells with a neutral grip at your sides.

MOVE

Slowly shrug your shoulders up toward your ears. At the top, pause for a moment and contract hard through your traps and rhomboids before slowly lowering the weights back to the starting position.

One-Arm Dumbbell Shrug



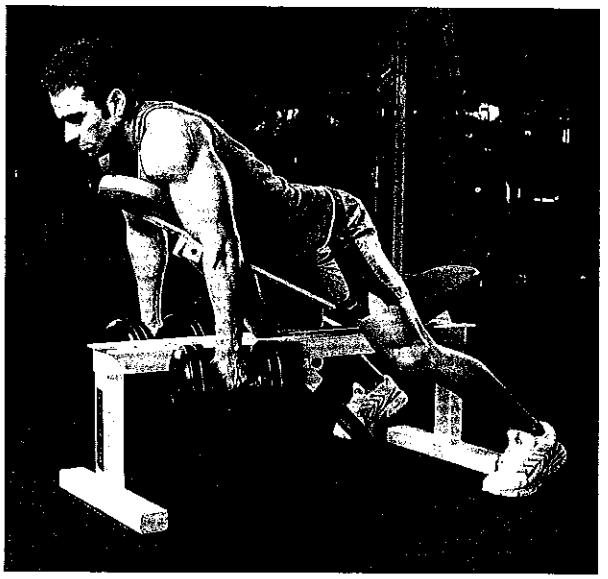
START

Stand with your feet shoulder-width apart. Hold a dumbbell in your right hand at your side.

MOVE

Slowly shrug your right shoulder up toward your ear. At the top, pause for a moment and contract the muscles hard before slowly lowering the weight back to the starting position.

Prone Incline Bench Dumbbell Shrug



START

Grab a pair of dumbbells and straddle an adjustable-incline bench with your feet flat on the floor. Hold the dumbbells with a neutral grip at your sides.

MOVE

Slowly shrug your shoulders up toward your ears. At the top, pause for a moment and contract hard through your traps and rhomboids before slowly lowering the weights back to the starting position.

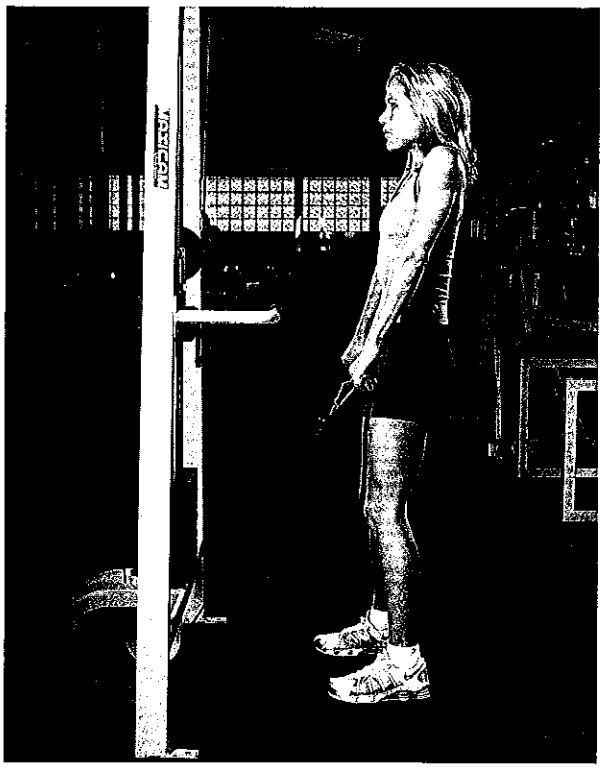
Cable Shrug

START

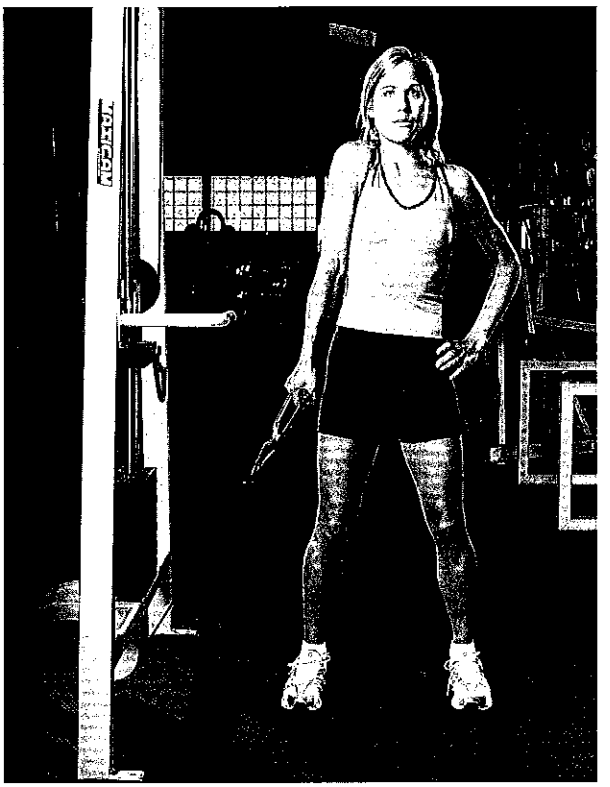
With feet shoulder-width apart, stand in front of a low-pulley cable while holding a straight bar attached to the low pulley.

MOVE

Slowly shrug your shoulders up toward your ears. At the top, pause for a moment and contract hard through your traps and rhomboids before slowly lowering the bar back to the starting position.



One-Arm Cable Shrug



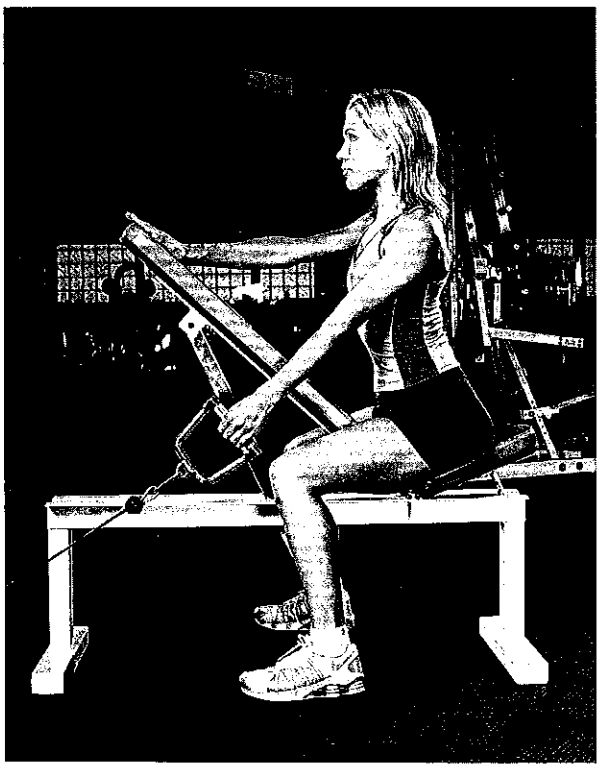
START

Stand with your right side toward a low-pulley cable and maintain a shoulder-width stance while holding a single-handle D-grip in your right hand.

MOVE

Shrug your right shoulder up toward your ear. At the top, pause for a moment and contract the muscles hard before slowly lowering the handle back to the starting position.

Prone Incline Cable Shrug



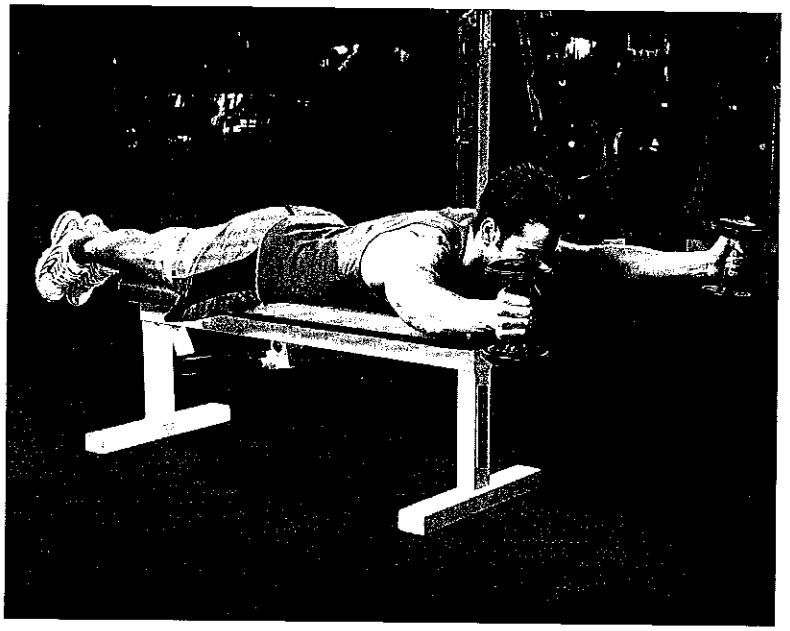
START

Place an incline bench next to a pulley apparatus so that the higher end is near the low pulley and to the right. Set the angle at about 30 to 45 degrees. With your left hand, grasp the single-handle D-grip attached to the low pulley. Sit straddling the bench and facing the weight stack. Lean against the bench to support your chest while extending your arm forward and down with a neutral grip.

MOVE

Slowly shrug your left shoulder up toward your ear. At the top, pause for a moment and contract the muscles hard before slowly lowering the handle back to the starting position. Complete the desired number of reps and then repeat with the right arm.

Y-Raise



START

Lie facedown on a flat bench with your chin past the end of the bench. Hold two light dumbbells with a neutral grip down toward the floor.

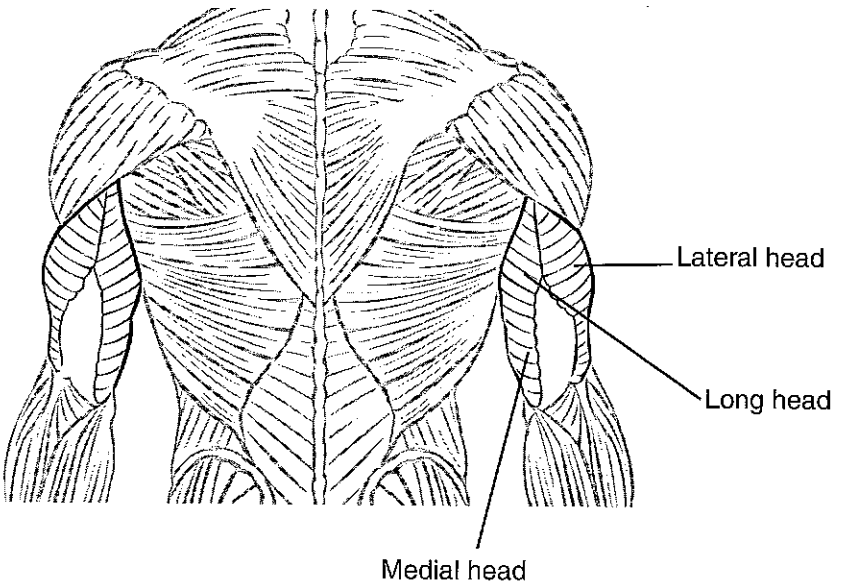
MOVE

Lift both dumbbells up as high as you can while forming a letter Y with your arms and torso. Hold this position for two seconds before returning the dumbbells to the starting position.

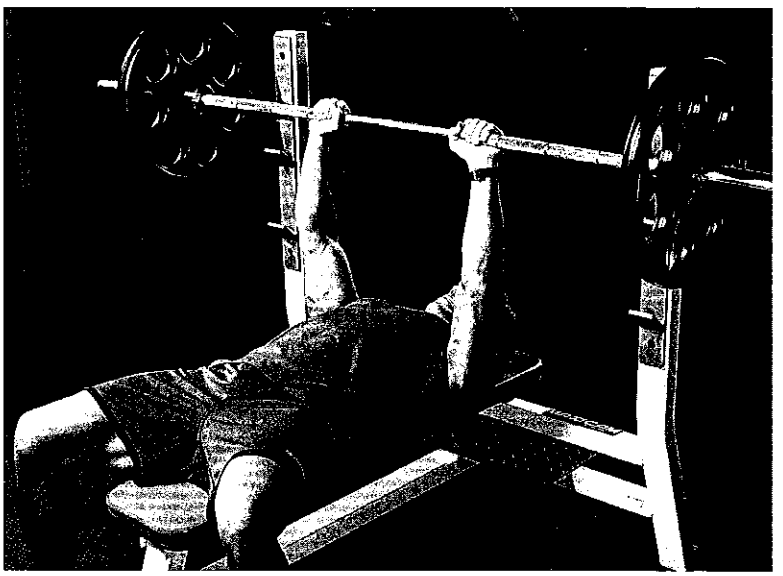
CHAPTER 15

Triceps

This chapter contains detailed descriptions of all major exercises that focus on the triceps muscles, including the lateral head, long head, and medial head. See the diagram below for the location of each of theses triceps heads. The triceps exercises are divided into pressing, dip, and push-up exercises; pressdown and kickback exercises; lying extension exercises; and overhead triceps extension exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Close-Grip Bench Press



START

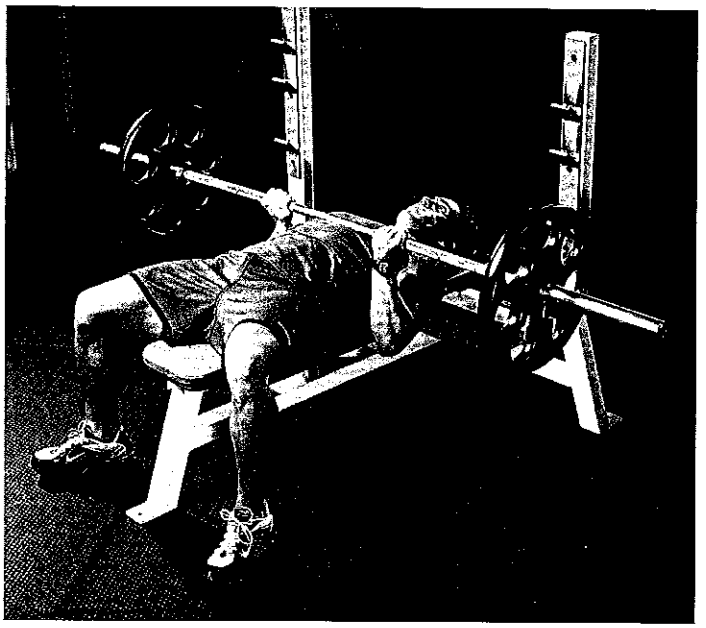
Lie faceup on a bench-press bench with your feet flat on the floor. With your hands shoulder-width apart, grasp the barbell with an overhand grip.

MOVE

Unrack the bar and slowly lower it to your lower chest, keeping your elbows as close to your sides as possible. At the bottom of the movement, your elbows should be a little lower than your shoulders. Press the bar back up to the start position.

Note: You can do this exercise with an EZ bar.

Reverse-Grip Bench Press



START

Lie faceup on a bench-press bench with your feet flat on the floor. With your hands shoulder-width apart, grasp the barbell with an underhand grip.

MOVE

Have a spotter help you unrack the bar and slowly lower it to your lower chest, keeping your elbows as close to your sides as possible. At the bottom of the movement, your elbows should be a little lower than your shoulders. Press the bar back up to the starting position.

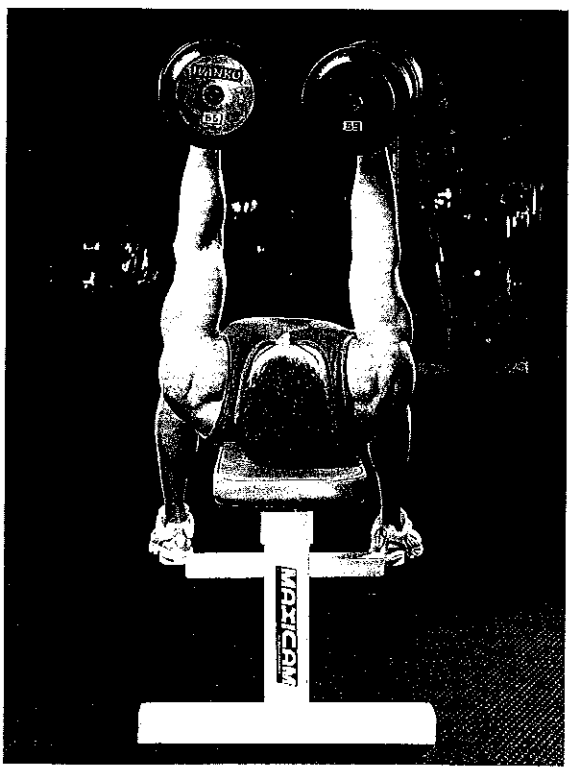
Close-Grip Dumbbell Press

START

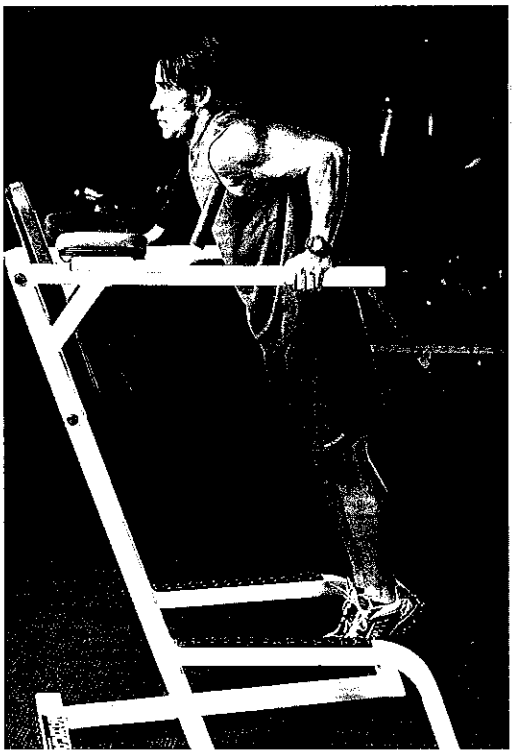
Lie back on a flat bench, holding two dumbbells at your chest with a neutral grip.

MOVE

Press the dumbbells straight overhead until your arms are fully extended. Flex your triceps hard at the top for a second before bringing the weights back down toward your chest.



Triceps Dip



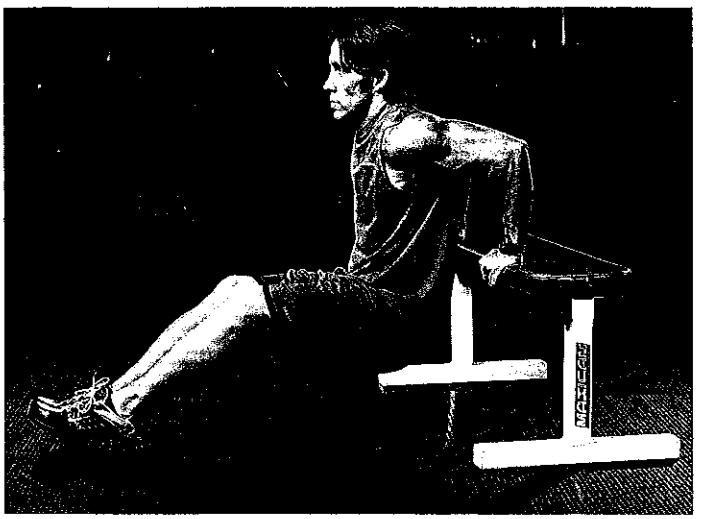
START

Grasp the dip bars with your arms extended and locked. Keep your body as vertical as possible to keep emphasis on the triceps and away from the chest. If the dip bars are high enough, keep your legs straight below you.

MOVE

Keep your elbows as close to your sides as possible as you bend them to lower your body down until your upper arms are about parallel to the floor. Press your hands forcefully into the bars to extend your arms and raise your body back up.

Bench Dip



START

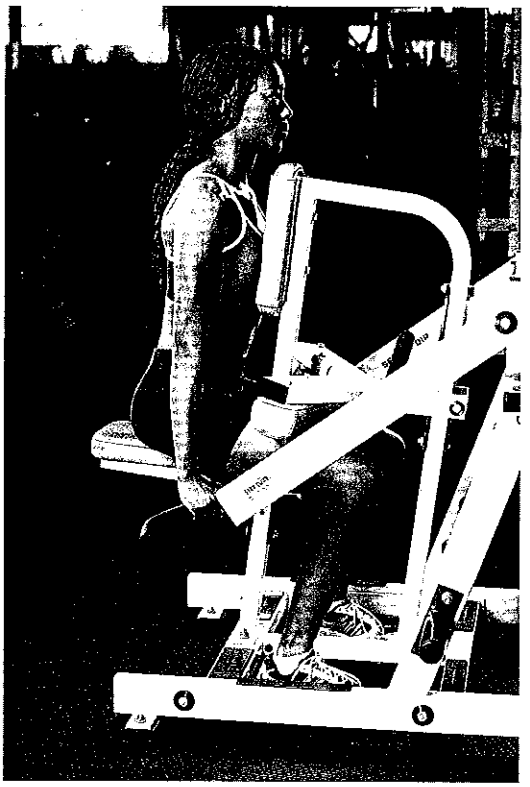
Place your hands on the side of a flat bench so that your body is perpendicular to the bench when you place your feet out in front of you. Only your heels should be on the floor and your legs should be straight. Your arms should be fully extended with just your palms on the bench.

MOVE

Bend your elbows to lower your body down until your elbows reach 90 degrees. Extend your arms to lift your body back to the starting position, flexing your triceps hard at the top.

Note: To make this exercise more difficult, place your heels up on a bench that is parallel to the other bench. Have a partner load weight plates on your lap to make it even more difficult.

Machine Dip



START

Sit on the seat of a machine dip with your feet flat on the floor and your chest pressed firmly against the pad. Grasp the handles with an overhand grip.

MOVE

With your arms close to your sides throughout (elbows pointed straight back behind you), press the handles down to full arm extension. Flex your triceps hard for a second and then slowly bring the handles back up until your elbows form a 90-degree angle.

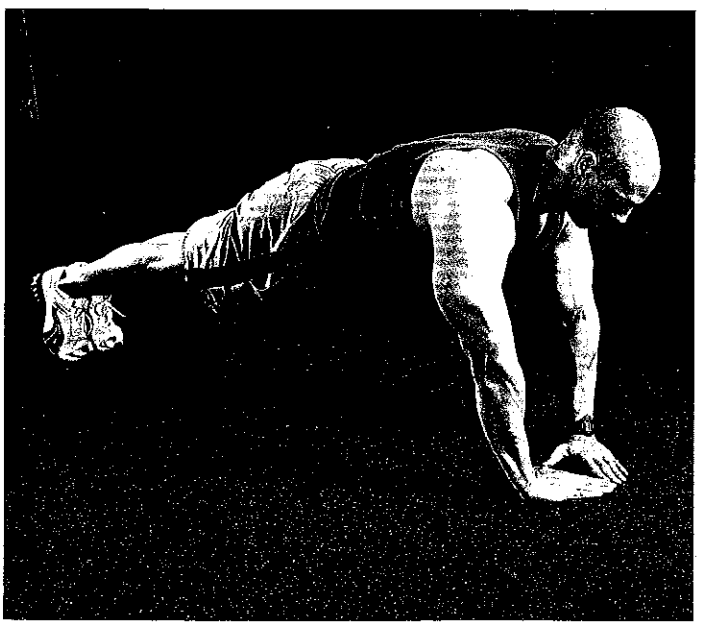
Close-Grip Push-Up

START

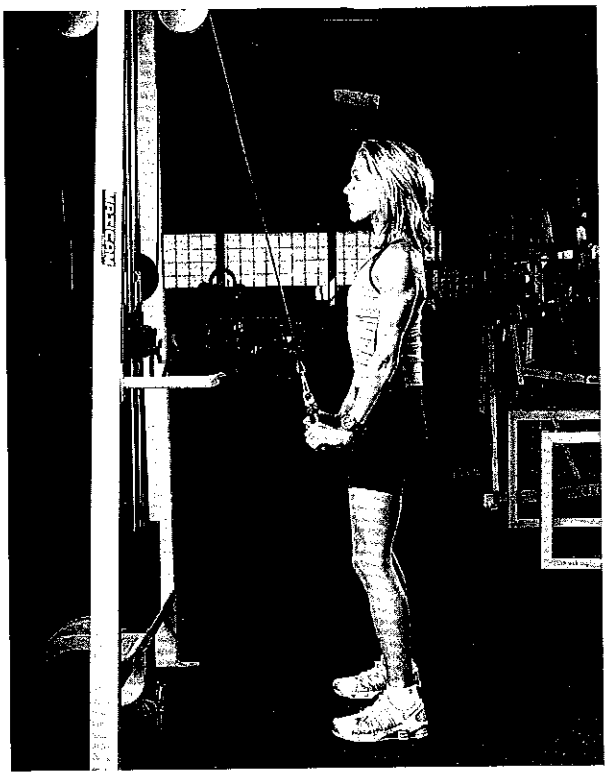
Lie facedown on the floor in a push-up position, placing your hands a few inches apart. Raise your body by extending your arms and coming up on your toes.

MOVE

With your forehead facing the floor and your abs pulled in, lower your body by bending your elbows. Stop the motion when your upper arms are about parallel to the floor, and reverse the movement to the starting position.



Triceps Pressdown



START

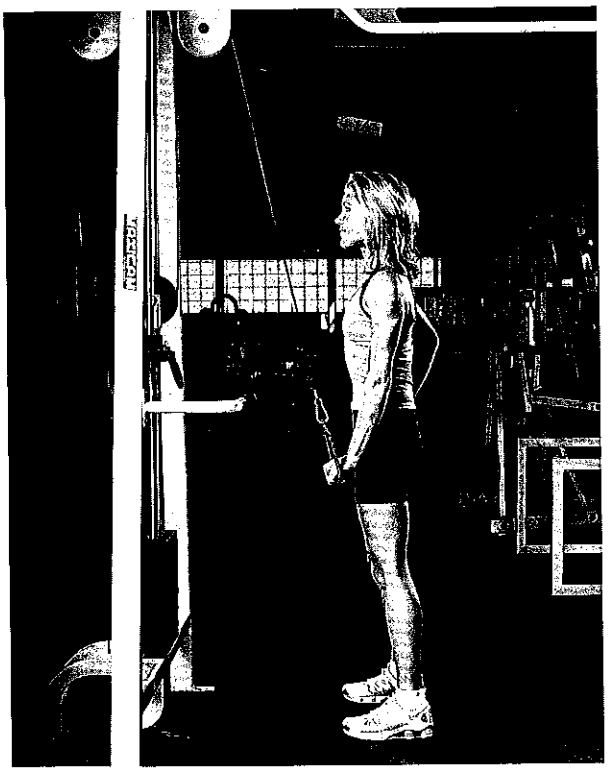
With a slight bend in your knees, stand facing a high-pulley cable with a pressdown bar attached to it. Your feet should be about shoulder-width apart. Grasp the pressdown bar with an overhand grip and hold the bar short at chest level with your elbows tight against your sides.

MOVE

Keeping your elbows stationary, straighten your arms until they are fully extended. Pause at full arm extension and flex your triceps, then slowly return the bar to the starting position.

Note: You can do this exercise with a rope, short straight bar, or EZ bar attachment.

One-Arm Cable Pressdown



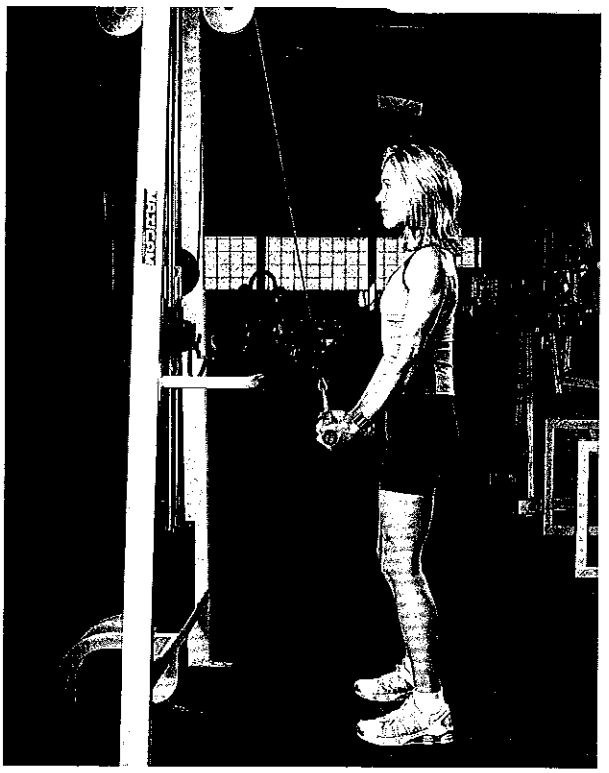
START

Stand facing a high-pulley cable with a single-handle D-grip attached to it. Your feet should be about shoulder-width apart and your knees should be slightly bent. Using an overhand grip, grasp the handle with your left hand and hold it at chest level with your elbow tight against your side.

MOVE

Keeping your elbow stationary, straighten your left arm until it is fully extended. Pause at full arm extension and flex your triceps, then slowly return the handle to the starting position. Complete as many reps as desired and then repeat with the right arm.

Reverse-Grip Cable Pressdown



START

With a slight bend in your knees, stand facing a high-pulley cable with a short straight bar attached to it. Your feet should be about shoulder-width apart. With an underhand grip, grasp the pressdown bar and hold the bar at chest level with your elbows tight against your sides.

MOVE

Keeping your elbows stationary, straighten your arms until they are fully extended. Pause at full arm extension and flex your triceps, then slowly return the bar to the starting position.

Note: You can do this exercise with an EZ bar attachment.

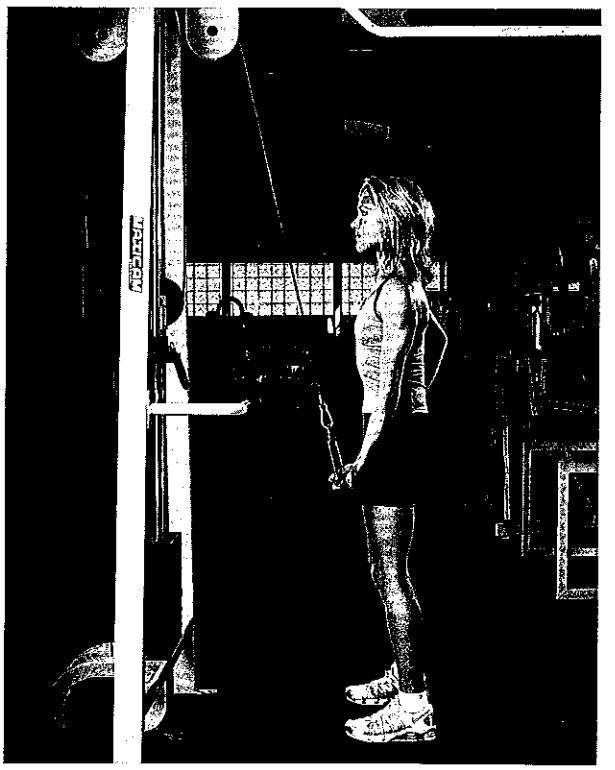
One-Arm Reverse-Grip Cable Pressdown

START

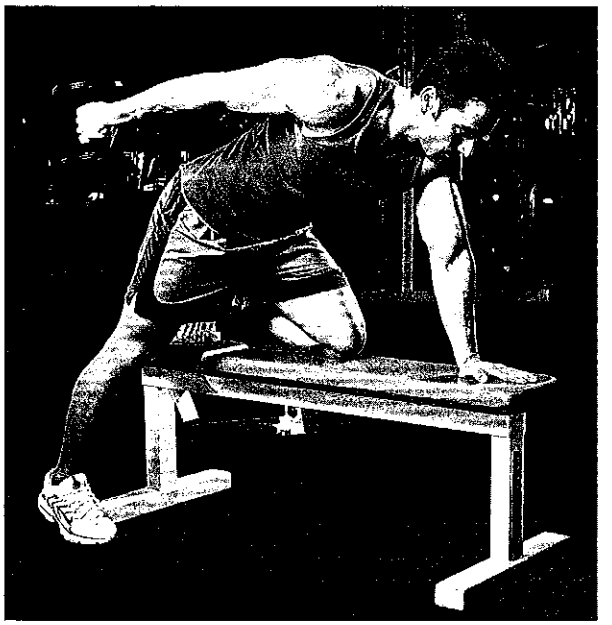
Stand facing a high-pulley cable with a single-handle D-grip attached to it. Your feet should be about shoulder-width apart and your knees should be slightly bent. Using an underhand grip, grasp the handle with your left hand and hold it at chest level with your elbow tight against your side.

MOVE

Keeping your elbow stationary, straighten your left arm until it is fully extended. Pause at full arm extension and flex your triceps, then slowly return the handle to the starting position. Complete as many reps as desired, then repeat with the right arm.



Dumbbell Kickback



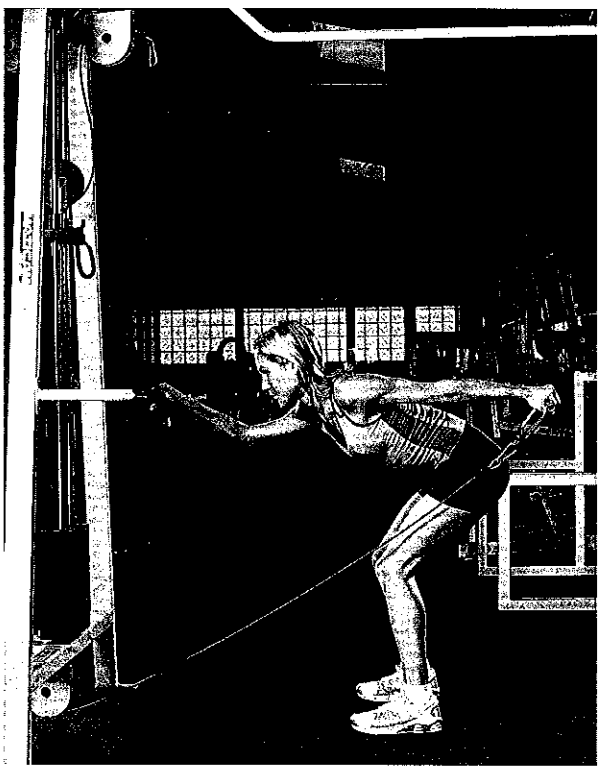
START

Place your left knee and palm on a flat bench so that your torso is parallel with the floor. While holding a dumbbell in the right hand and keeping the right foot flat on the floor, press your right arm tight against your side with the upper arm parallel to the floor.

MOVE

Extend at the elbow until your arm is straight back and fully extended. Flex the triceps hard for a second, then reverse to the starting position.

Cable Kickback



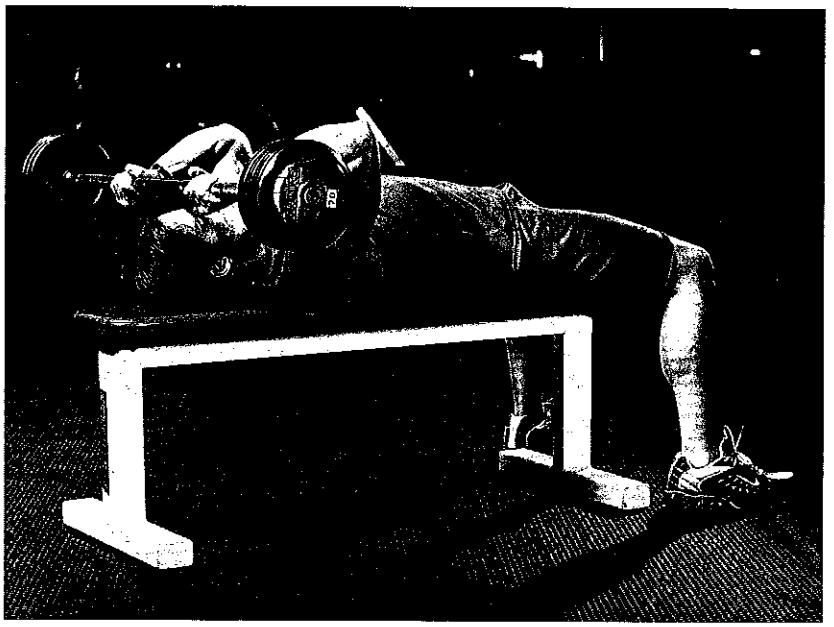
START

Face the weight stack and bend from the waist so that your torso is about parallel to the floor. With an underhand grip, grasp a single-handle D-grip attached to a low pulley. Raise your elbow so that your upper arm is parallel to the floor and your elbow is bent 90 degrees and tucked at your side. Brace your right arm on your thigh or on the pulley cable apparatus.

MOVE

Extend your arm back and up until your arm is fully extended. Flex the triceps hard for a second, then reverse to the starting position. Complete as many reps as desired, then repeat with the right arm.

Lying Triceps Extension



START

Lie faceup on a flat bench with your feet flat on the floor. Hold a barbell at full arm extension over your chest.

MOVE

Keeping your upper arms stationary, lower your lower arms to bring the bar down to your forehead, then push it back up.

Note: You can do this exercise with an EZ bar.

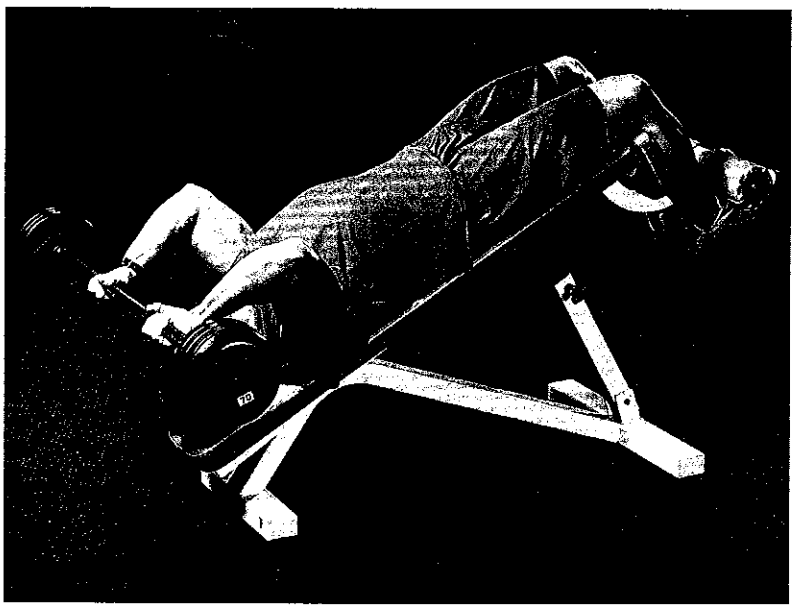
Decline Triceps Extension

START

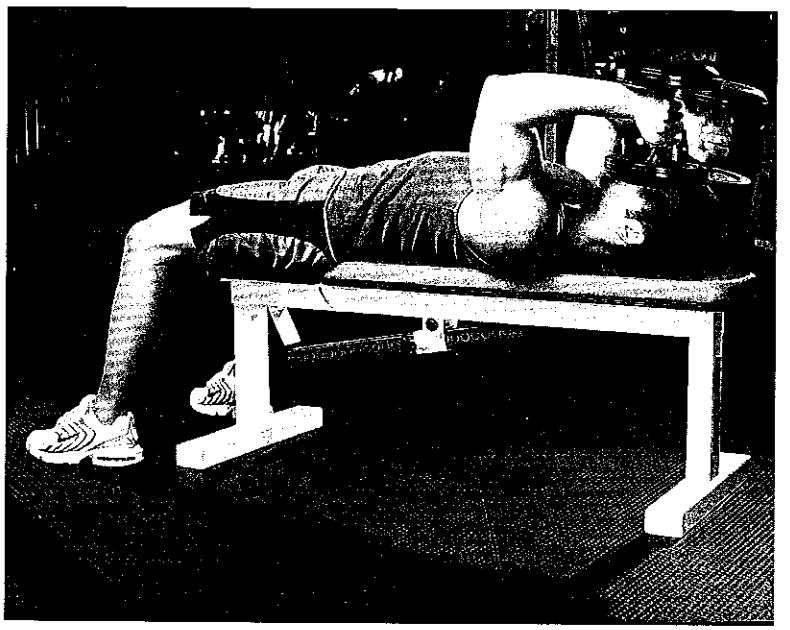
Lie faceup on an adjustable-decline bench with your feet secured under the foot pads. Take a shoulder-width, overhand grip on a barbell and lift it into position over your forehead, keeping your arms straight.

MOVE

Bend your elbows and lower the weight to your forehead, then extend your arms to return the bar to the starting position.



Dumbbell Lying Triceps Extension



START

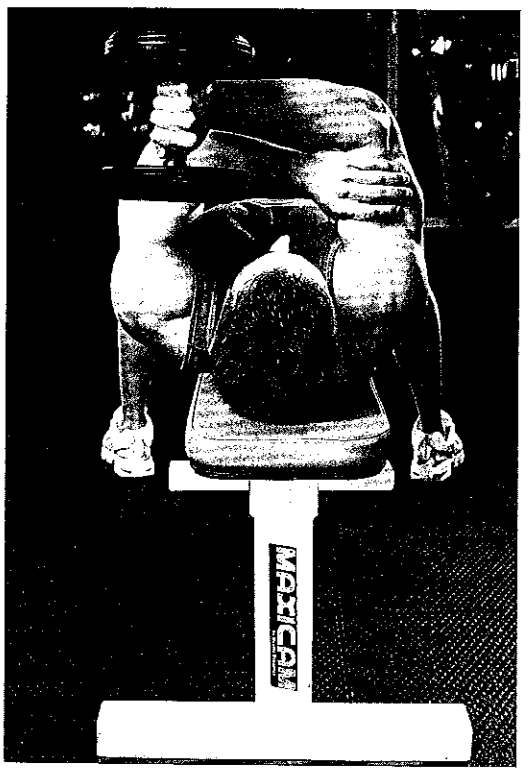
Lie faceup on a flat bench with your feet flat on the floor. With a neutral grip, hold a pair of dumbbells at full arm extension over your chest.

MOVE

Keeping your upper arms stationary, lower your lower arms to bring the dumbbells to the sides of your head, then push them back up.

Note: You can do this exercise on a decline bench.

One-Arm Dumbbell Lying Triceps Extension



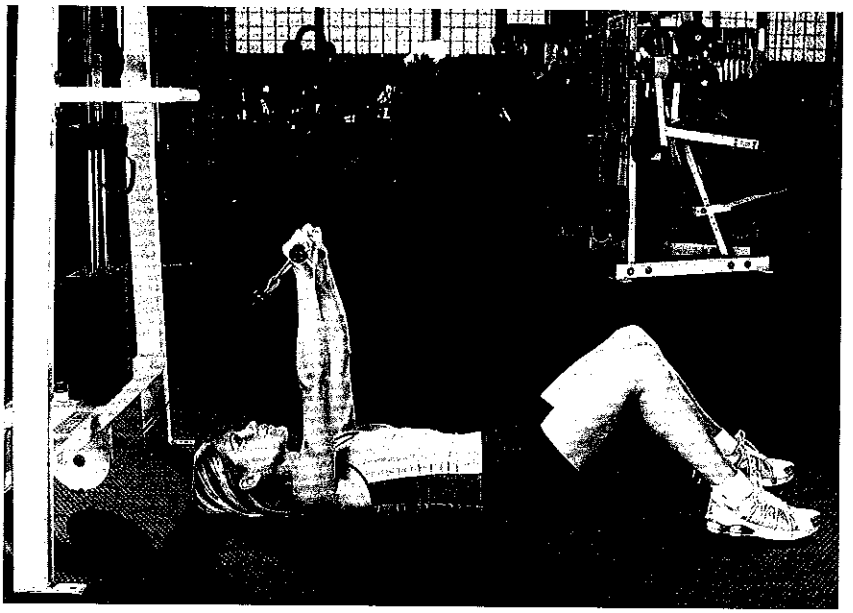
START

Lie on a flat bench and hold a dumbbell in your right hand with an overhand grip. Extend your arm so that the dumbbell is straight up from your right shoulder.

MOVE

Without letting your upper arm move, bend at the elbow to bring the dumbbell down across your body toward the left shoulder. Stop when your elbow reaches 90 degrees and reverse the motion to bring the dumbbell back up to full arm extension. Complete as many reps as desired, then repeat with the left arm.

Cable Lying Triceps Extension



START

Lie faceup on the floor lengthwise in the middle of a cable crossover apparatus. Your head is closest to the low-pulley cable. With an overhand grip, grab a straight bar handle attached to the low pulley and extend your arms straight over your head.

MOVE

Keeping your upper arms perpendicular to your torso, lower the bar to the top of your head. Extend your arms to lift the bar back up to full extension.

Note: You can do this exercise with an EZ bar attachment.

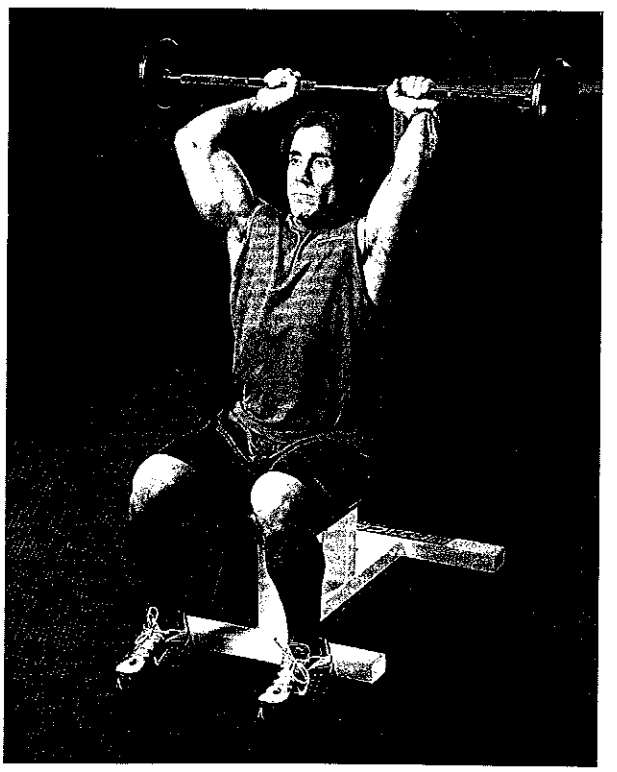
Overhead Barbell Triceps Extension

START

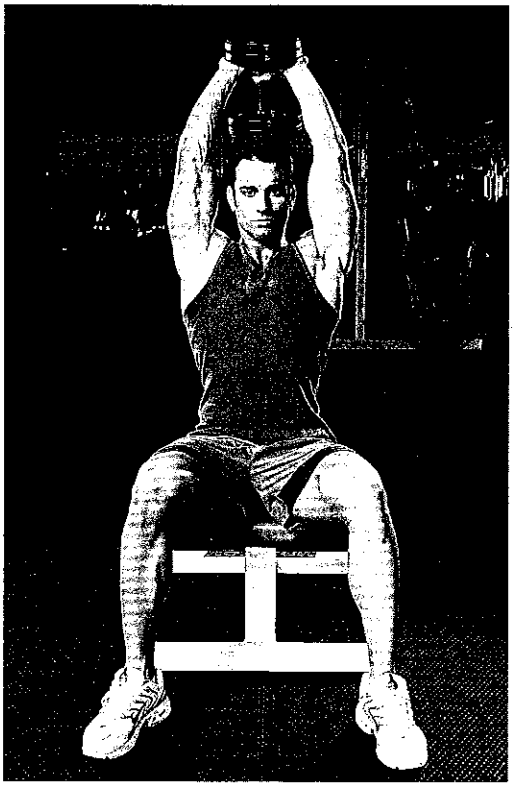
Sit on a low-back bench and extend a barbell overhead, holding it with a shoulder-width grip.

MOVE

Keeping your upper arms right beside your head, lower the bar behind your head until your elbows form 90-degree angles, then lift it back to full arm extension.



Overhead Dumbbell Triceps Extension



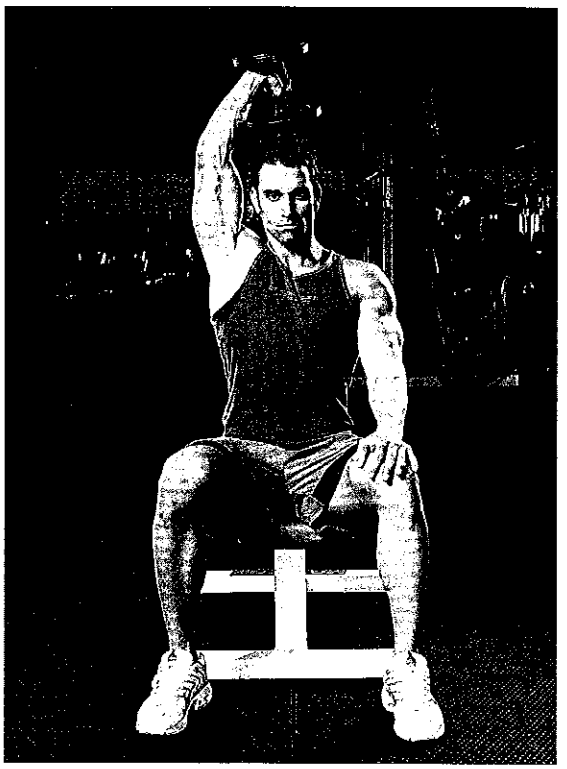
START

Sit on a low-back bench and hoist a dumbbell overhead, holding it with both hands, palms cupped against the upper inside plates.

MOVE

Keeping your upper arms right beside your head, lower the dumbbell behind your head until your elbows form 90-degree angles, then lift it back to full arm extension.

One-Arm Overhead Dumbbell Triceps Extension



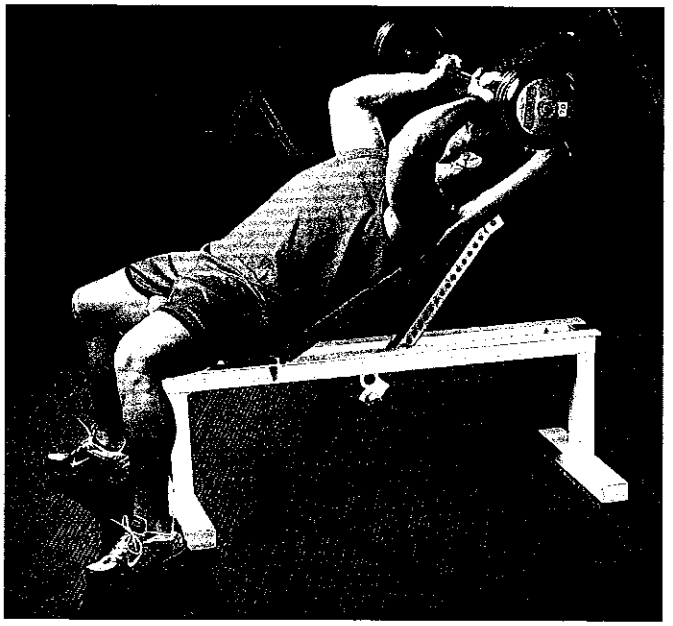
START

Sit on a low-back bench and lift a dumbbell overhead with your right hand. Hold it straight overhead with an overhand grip (palm facing forward).

MOVE

Keeping your upper arm right beside your head, lower the dumbbell behind your head and toward your left shoulder until your elbow forms a 90-degree angle, then lift it back to full arm extension.

Incline Overhead Triceps Extension



START

Recline on an incline bench set to 45 degrees and raise a barbell overhead with an overhand grip.

MOVE

Bend your elbows to begin slowly lowering the bar until it's behind your head. Push the weights back up to full arm extension.

Note: You can do this exercise with a barbell, one dumbbell, or a pair of dumbbells.

Overhead Cable Triceps Extension

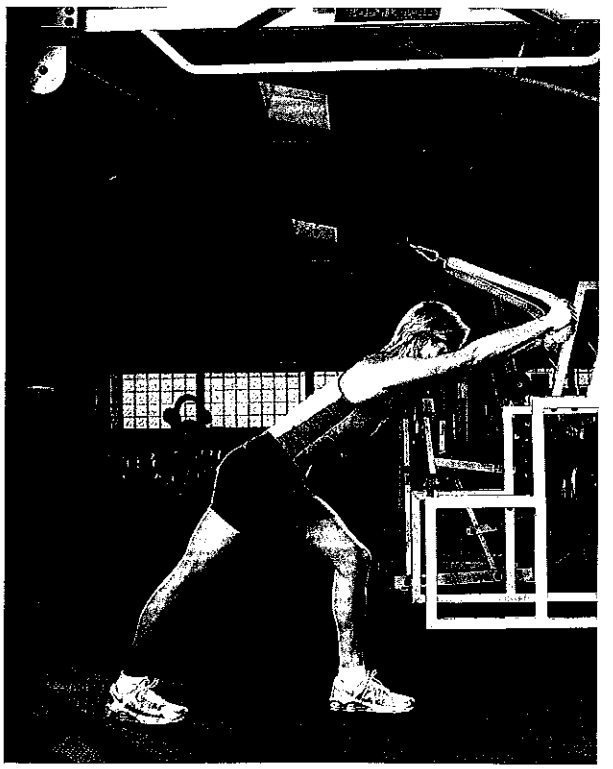
START

Stand with your back to a high pulley with a rope attached to it. With a neutral grip, grasp the rope just behind your head and stand with your torso leaning forward. Keep your elbows beside your ears and bring your forearms back to form a 90-degree angle.

Move

Keep your upper arms stationary as you move only from the elbows to press the weight to full arm extension.

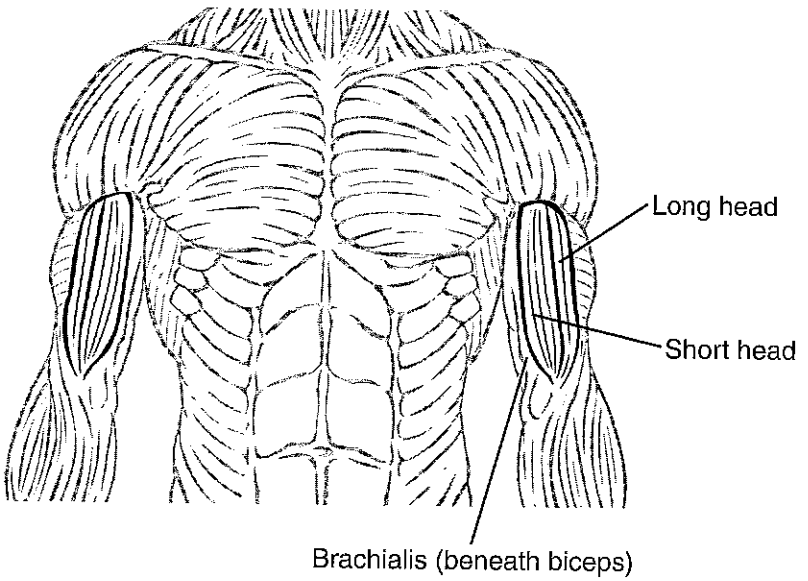
Note: You can do this exercise with a short straight bar or EZ bar attachment.



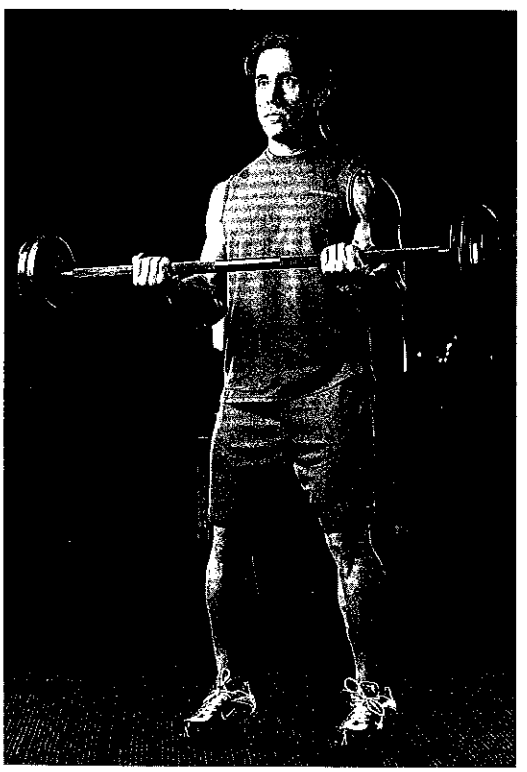
CHAPTER 16

Biceps

This chapter contains detailed descriptions of all major exercises that focus on the biceps muscles, including the biceps brachii and brachialis. The biceps muscles include the long head and short head, which can be seen in the diagram below. The brachialis is located beneath the biceps. The biceps exercises are divided into standing curl exercises; seated curl exercises; cable curl exercises; preacher, concentration, and machine curl exercises; and hammer and reverse-grip curl exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Barbell Curl



START

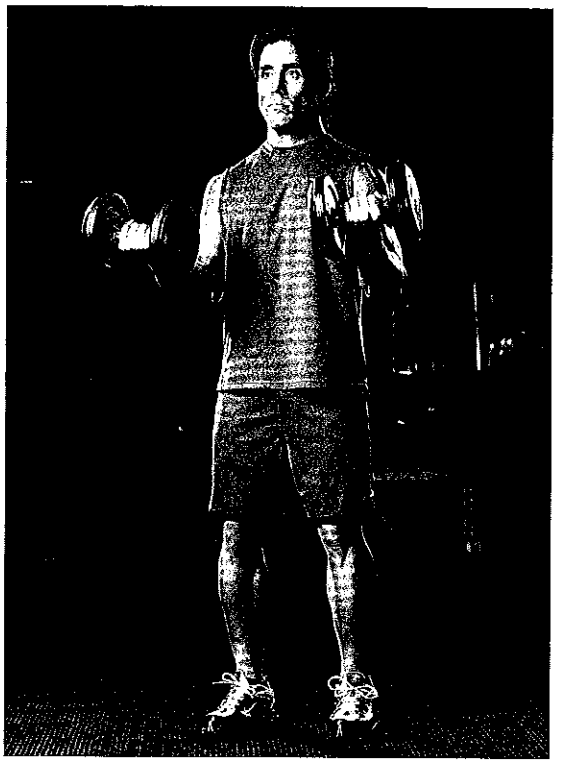
With your knees slightly bent and your feet about hip-width apart, grasp a barbell with a shoulder-width, underhand grip. Let the bar hang to your thighs. Keep your abs pulled in and your elbows stationary.

MOVE

Without swaying, slowly curl the bar in an arc toward your shoulders. Pause at the top of the movement, squeeze your biceps, and slowly lower the bar to the starting position.

Note: You can do this exercise with an EZ bar.

Standing Dumbbell Curl



START

Stand with your knees slightly bent and your feet about hip-width apart. Grasp a pair of dumbbells with an underhand grip. Let the dumbbells hang at the sides of your thighs.

MOVE

Without swaying, slowly curl the dumbbells in an arc toward your shoulders. Pause at the top of the movement, squeeze your biceps, and slowly lower the weights to the starting position.

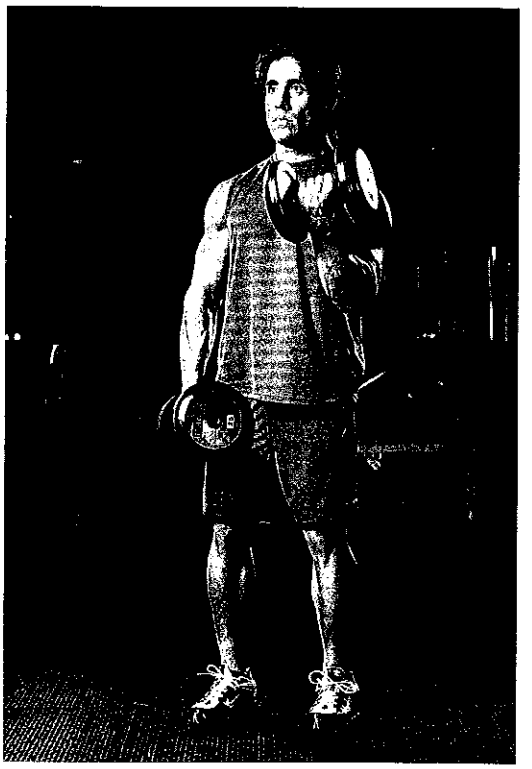
Standing Alternating Dumbbell Curl

START

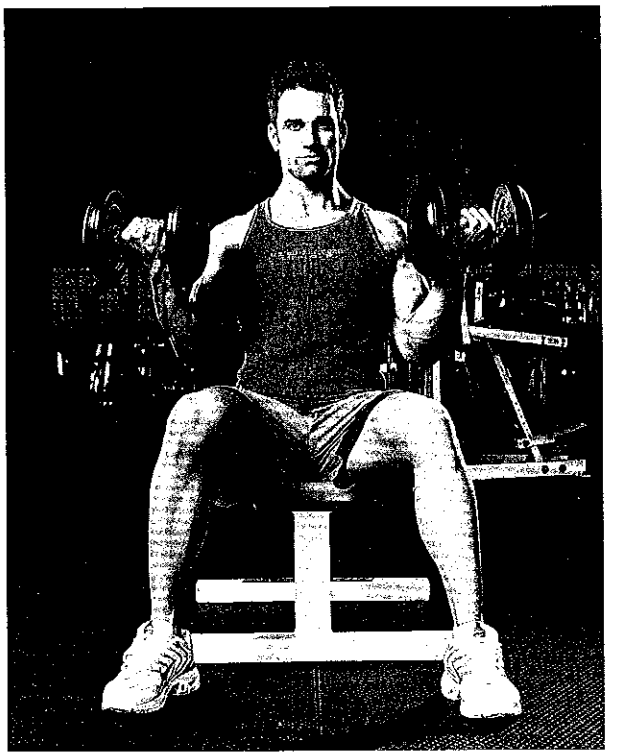
Stand with your knees slightly bent and your feet about hip-width apart. Grasp a pair of dumbbells with a neutral grip. Let the dumbbells hang at the sides of your thighs.

MOVE

Slowly curl the left arm in an arc toward your shoulder. As the dumbbell passes your hip, start to supinate your wrist (turn it out) until your palm is facing your shoulder at the top position. Pause at the top of the movement, squeeze your biceps, and slowly lower the weight in the reverse manner. Repeat the movement with the right arm. One curl with both arms equals one rep.



Seated Dumbbell Curl



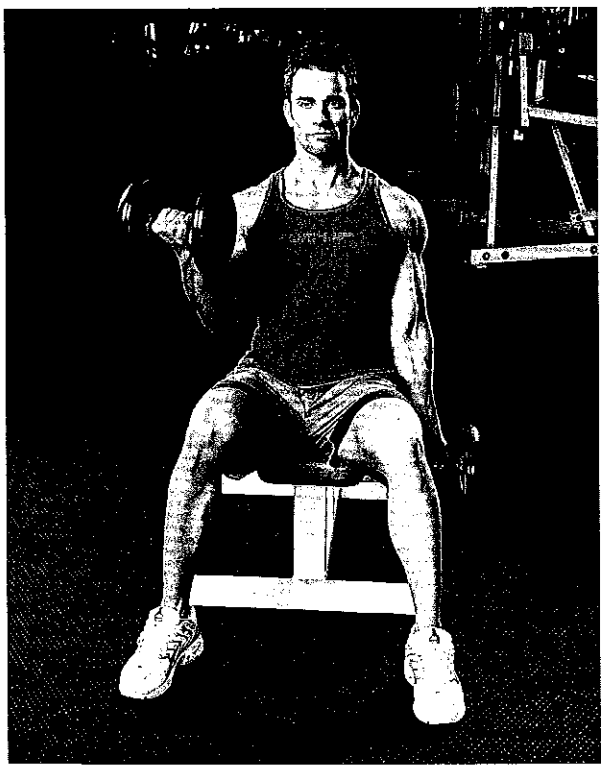
START

Sit at the end of a flat bench or on a low-back bench with your feet planted firmly on the floor. Hold a pair of dumbbells with an underhand grip and let them hang at the sides of the bench.

MOVE

Curl the dumbbells up in an arc toward your shoulders. Pause at the top of the movement, squeeze your biceps, and slowly lower the weights to the starting position.

Seated Alternating Dumbbell Curl



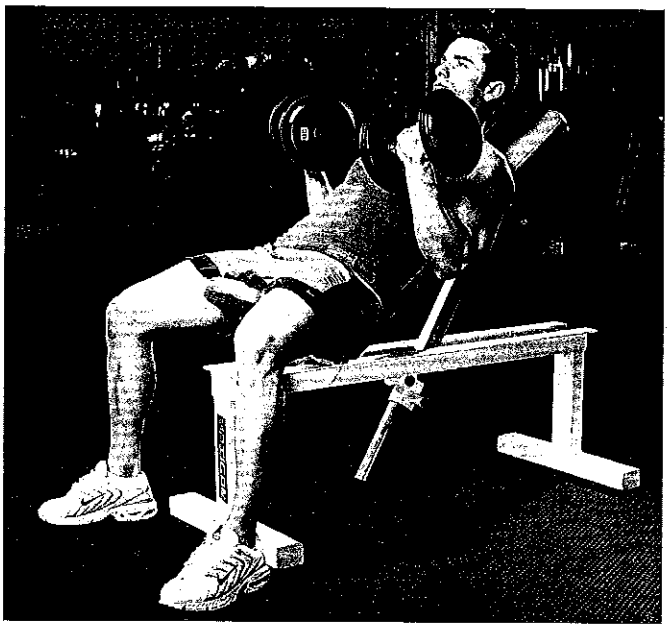
START

Sit at the end of a flat bench or on a low-back bench with your feet planted firmly on the floor. Hold a pair of dumbbells with a neutral grip and let them hang at the sides of the bench.

MOVE

Slowly curl the right arm in an arc toward your shoulder. As the dumbbell passes your hip, start to supinate your wrist (turn it out) until your palm is facing your shoulder at the top position. Pause at the top of the movement, squeeze your biceps, and slowly lower the weight in the reverse manner. Repeat the movement with the left arm. One curl with both arms equals one rep.

Incline Dumbbell Curl



START

Grasp a pair of dumbbells and lie back on an incline bench set at about 60 degrees, allowing your arms to hang straight down toward the floor by your sides. Use an underhand grip, with your palms facing forward.

MOVE

Keeping your shoulders back and upper arms in a fixed position perpendicular to the floor, lock your elbows at your sides and curl both dumbbells toward your shoulders. Slowly return the dumbbell to the starting position.

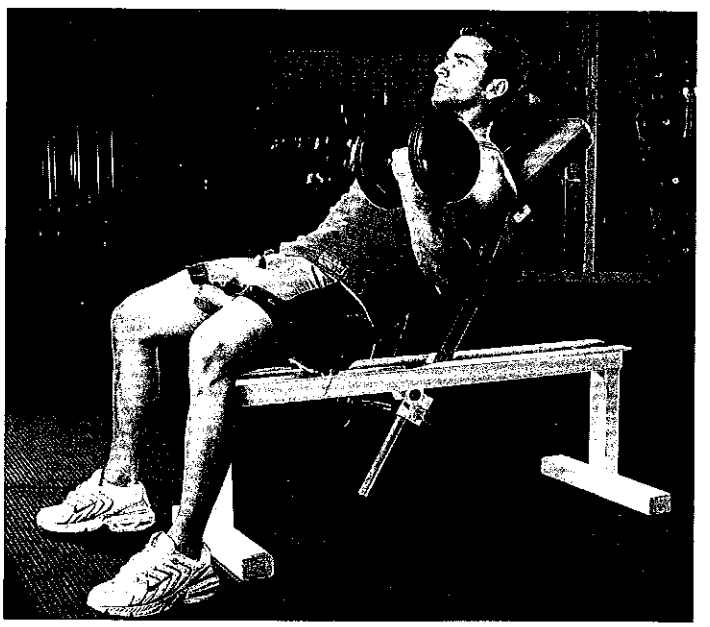
Incline Alternating Dumbbell Curl

START

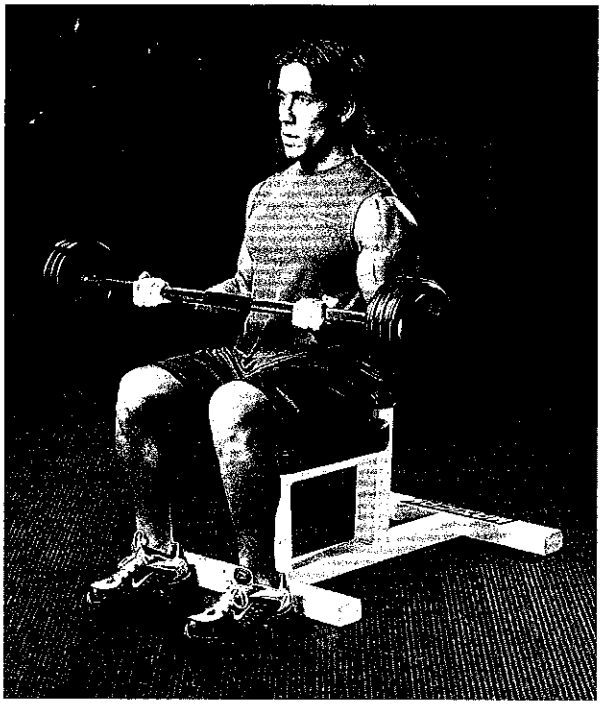
Grasp a pair of dumbbells and lie back on an incline bench set at about 60 degrees, allowing your arms to hang straight down toward the floor by your sides. Use a neutral grip, with your palms facing in.

MOVE

Keeping your shoulders back and upper arms in a fixed position perpendicular to the floor, lock your elbows at your sides and curl one arm toward your shoulder. As you curl, supinate your wrist so that your palm faces your shoulder at the top of the movement. Slowly return the dumbbell to the starting position along the same path and repeat with the other arm.



Seated Barbell Curl



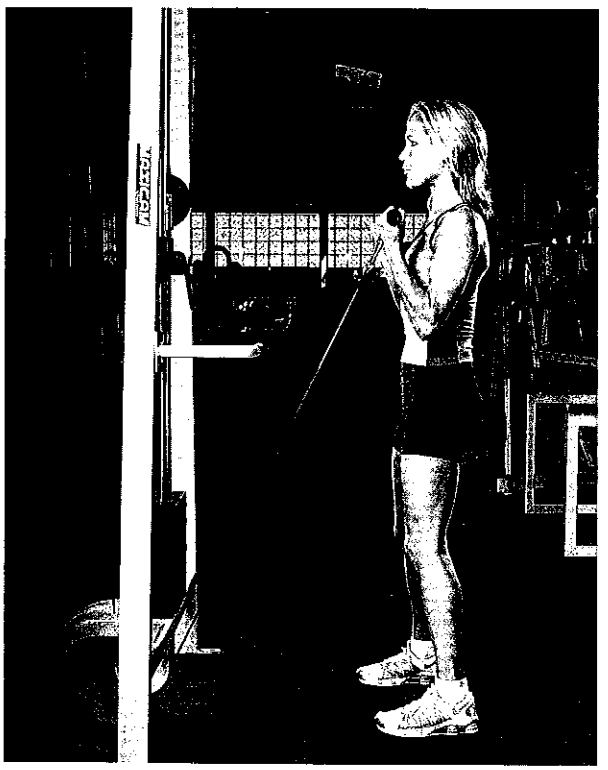
START

Load a barbell with 10 to 20 pounds more than you can do for regular barbell curls. Sit on a short-back bench or an adjustable bench set to 90 degrees and rest the bar on your thighs.

MOVE

With an underhand, shoulder-width grip, curl the weight toward your shoulders, keeping your back flat against the bench. Slowly lower the weight and repeat.

Standing Cable Curl



START

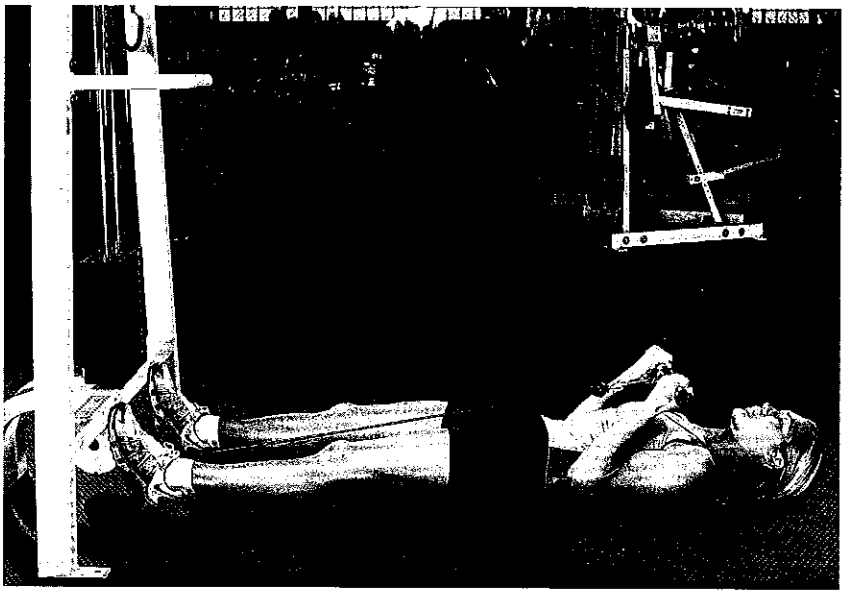
Stand in front of a low-pulley cable with your knees slightly bent and your feet about hip-width apart. With an underhand, shoulder-width grip, grab a straight bar attached to the low pulley. Hold the bar in front of your thighs and step back from the pulley about a foot to keep the weight plates from touching the bottom plate.

MOVE

Curl the bar up in an arc toward your shoulders. Pause at the top of the movement, squeeze your biceps, and slowly lower the bar to the starting position.

Note: You can do this exercise with an EZ bar attachment.

Lying Cable Curl



START

Lie on the floor in front of a low-pulley cable with the pulley in the middle of your feet. With an underhand, shoulder-width grip, grasp a straight bar attached to the low pulley and lean back until your back is flat against the floor.

MOVE

Curl the bar in an arc toward your shoulders. Pause at the top of the movement, squeeze your biceps, and slowly lower the bar to the starting position.

Note: You can do this exercise with an EZ bar attachment.

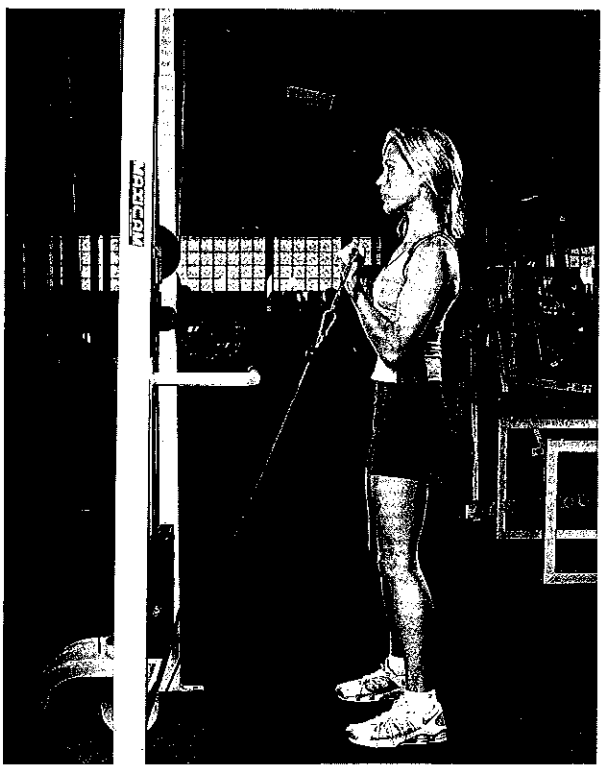
One-Arm Cable Curl

START

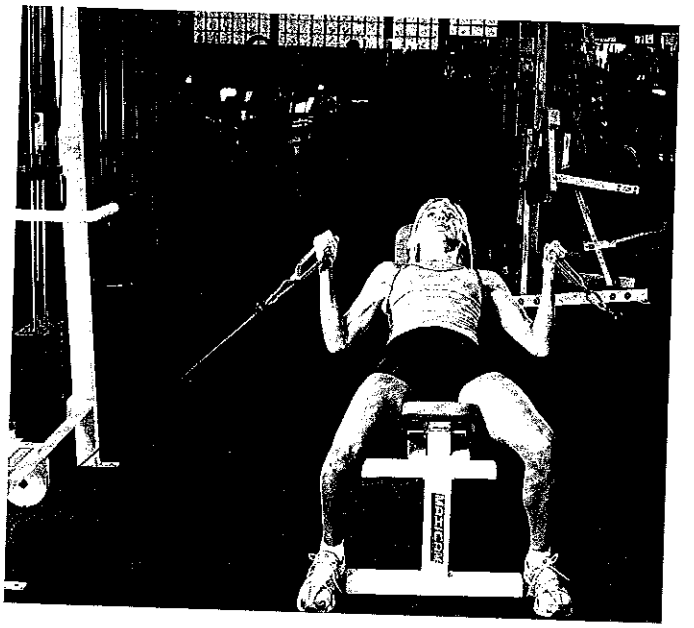
With your feet shoulder-width apart, stand about a foot away from a low-pulley cable apparatus. Using an underhand grip with your left hand, hold a single-handle D-grip attached to a low-pulley handle.

MOVE

Curl the handle up in an arc toward your shoulder. Hold the contraction at the top for a second before returning to the starting position. Complete the desired number of reps and repeat on the right side.



Incline Cable Curl



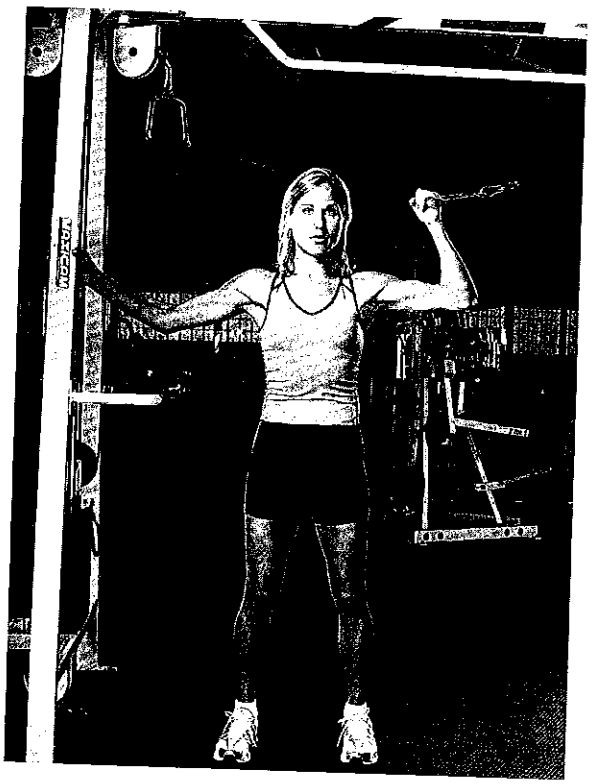
START

Place an incline bench set at 45 to 60 degrees in the middle of a cable crossover apparatus. Grab the single-handle D-grips attached to the low pulleys and sit on the incline bench holding your arms down and out to your sides in line with the cables.

MOVE

Curl both arms toward your shoulders. Slowly return the handles to the starting position.

One-Arm High-Cable Curl



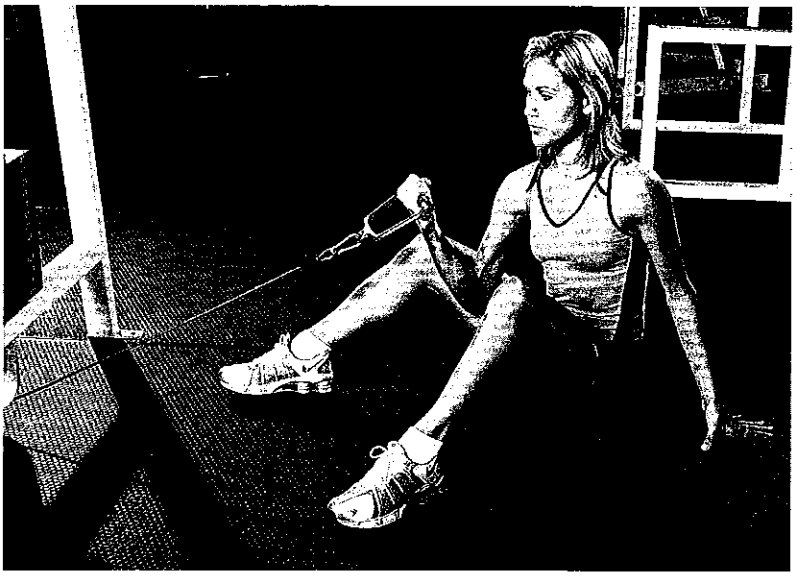
START

With an underhand grip, grasp the single-handle D-grip attached to the upper pulley. Your working arm should be extended out to your side and parallel with the floor or slightly higher. Hold on to the opposite side of the cable crossover apparatus.

MOVE

Curl the handle in toward your shoulder while keeping your upper arm stationary. Hold for a second in the flexed position while squeezing your biceps hard. This will look like a bodybuilder doing a biceps pose. Slowly return the handle to the starting position.

Seated One-Arm Cable Concentration Curl



START

Sit on the floor about two feet (61 centimeters) in front of a low-pulley cable with a single-handle D-grip attached to the pulley. Using an underhand grip, grasp the handle with your right hand and brace your arm against the inside of your right thigh.

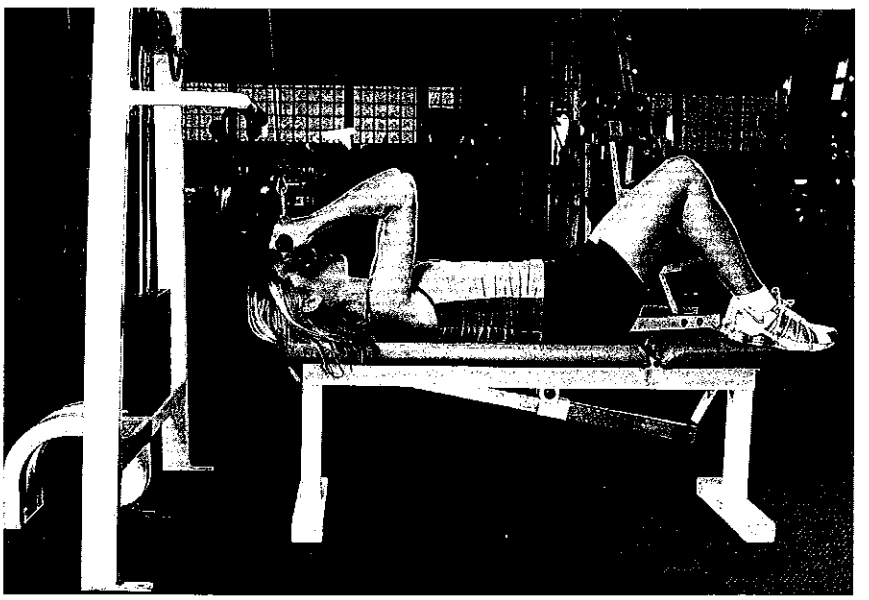
MOVE

Curl the handle up toward your shoulder while keeping your upper arm stationary against your leg. Hold for a second in the flexed position while squeezing your biceps hard. Slowly return the handle to the starting position.

Lying Cable Concentration Curl

START

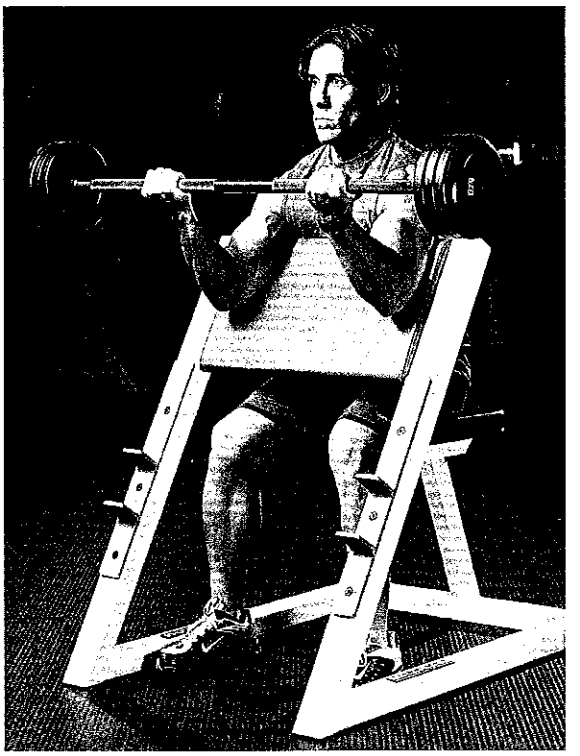
Lie faceup on a flat bench set lengthwise in the middle of a cable crossover apparatus with your head closest to the pulley. With an underhand grip, grab a straight-bar handle attached to the high pulley and extend your arms straight over your chest.



MOVE

Keeping your upper arms perpendicular to your torso, curl the bar toward your forehead. Hold the contraction for a second, then slowly return the bar to the starting position.

Barbell Preacher Curl



START

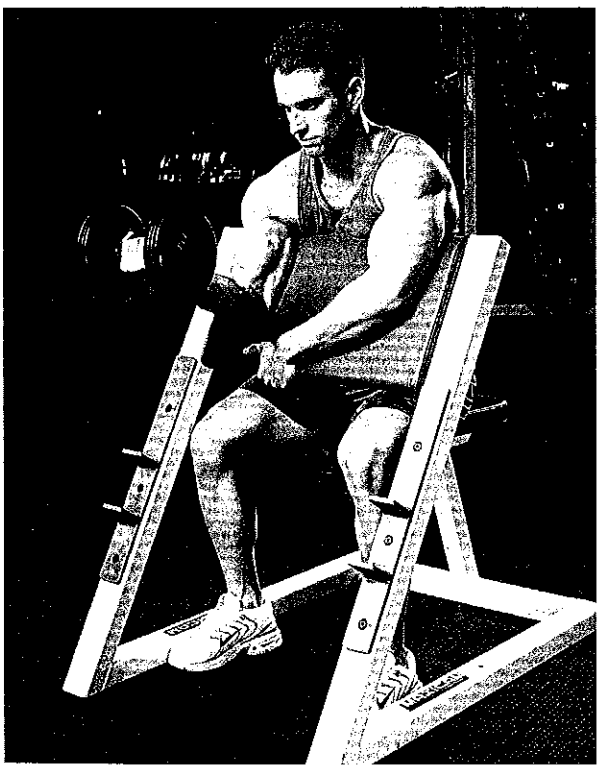
Set the seat height of the preacher curl bench so that when you sit down, the armrest is slightly below shoulder level. Place your upper arms over the armrest and grab a barbell with an underhand grip.

MOVE

With the backs of your upper arms pressed firmly against the pad, curl the bar up toward your shoulders until your elbows are just a bit beyond 90 degrees. Forcefully flex the biceps at the top of the movement, then slowly lower the weight.

Note: You can do this exercise with an EZ bar.

One-Arm Dumbbell Preacher Curl



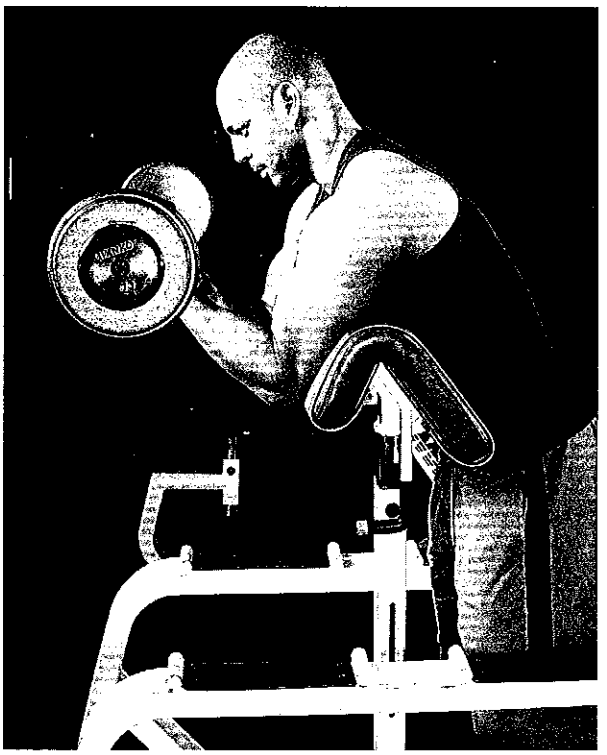
START

Set the seat height of the preacher curl bench so that when you sit down, the armrest is slightly below shoulder level. Grasp a dumbbell in your right hand and place the back of your upper arm flush against the angled side of the preacher bench pad. Brace yourself with the left arm for stability.

MOVE

Curl the dumbbell up toward your shoulder until your elbow is just a bit beyond 90 degrees. Forcefully flex the biceps at the top of the movement, then slowly lower the weight to the starting position. Complete the desired number of reps and then repeat on the left side.

Scott Curl



START

Flip the pad on a preacher bench so that your chest and abs rest on the inclined side and your arms lie along the flat, vertical side. Lean into the pad so that your body weight is partially supported. Take an underhand, shoulder-width grip on a barbell and allow your arms to hang straight down from your shoulders along the flat side of the armrest.

MOVE

Slowly curl the bar up toward your shoulders, keeping your upper arms pressed into the pad and your upper body steady. Hold the contraction at the top for a second and flex the biceps as hard as possible. Slowly return the weight to the starting position.

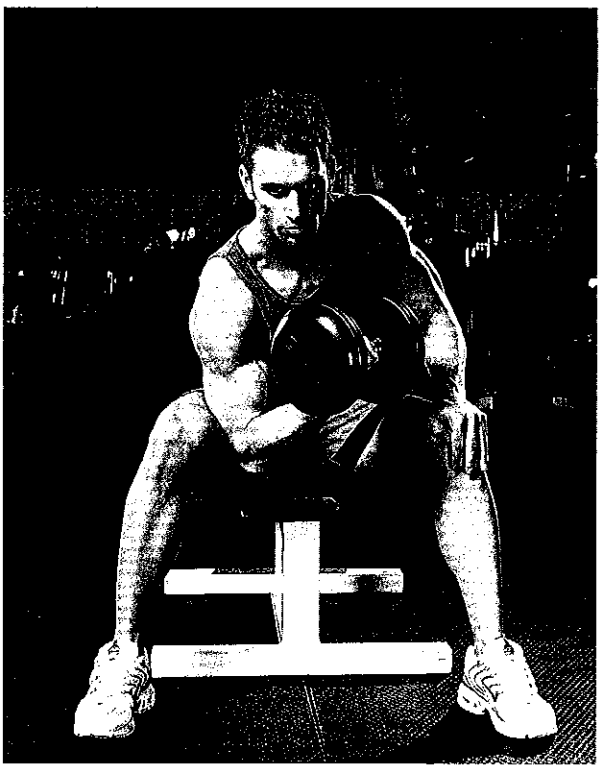
Dumbbell Concentration Curl

START

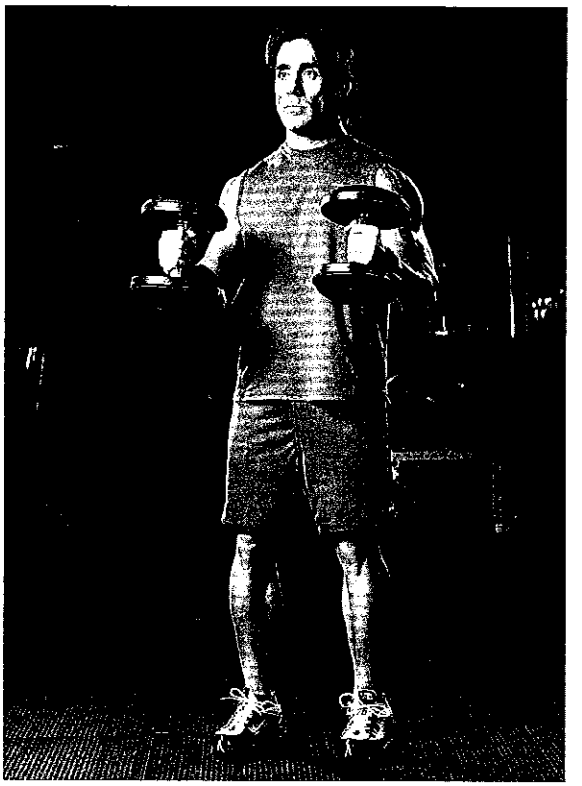
Sit at the end of a bench with your feet shoulder-width apart. Plant your right elbow against your right inner thigh and let your arm hang straight down while holding a dumbbell with an underhand grip in your right hand.

MOVE

Contract your biceps to curl the dumbbell up toward your shoulder, then lower it under control all the way down to the starting position. Complete the desired number of reps and then repeat on the left side.



Dumbbell Hammer Curl



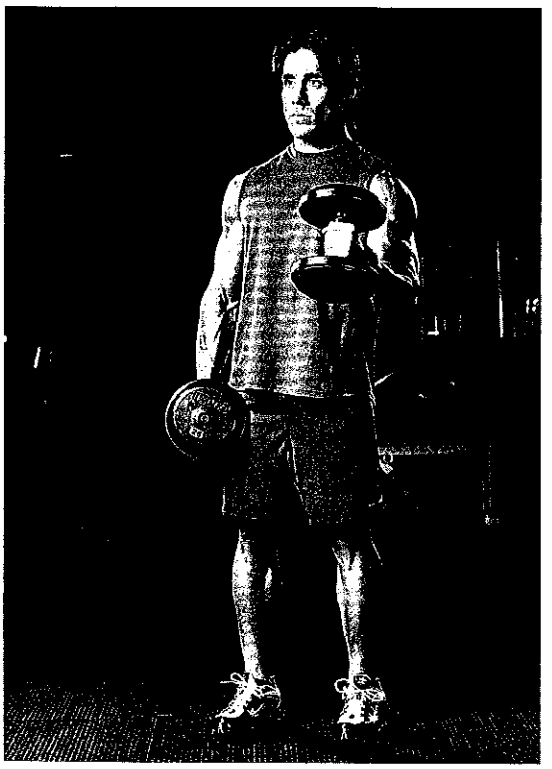
START

With your knees slightly bent and your feet about hip-width apart, grasp a pair of dumbbells with a neutral grip. Let the dumbbells hang at the sides of your thighs.

MOVE

Slowly curl the dumbbells up in an arc toward your shoulders while maintaining the neutral grip. Pause at the top of the movement, and slowly lower the weights back to the starting position.

Alternating Dumbbell Hammer Curl



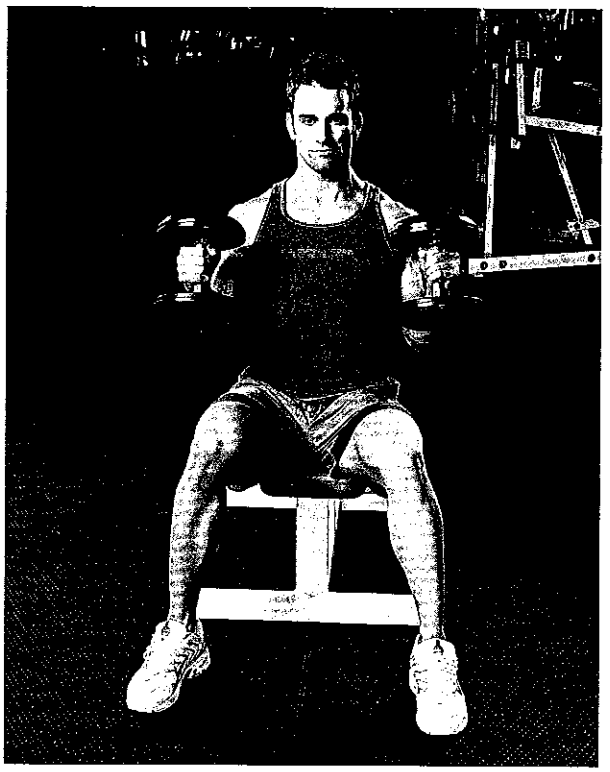
START

With your knees slightly bent and your feet about hip-width apart, grasp a pair of dumbbells with a neutral grip. Let the dumbbells hang at the sides of your thighs.

MOVE

Slowly curl the left arm in an arc toward your shoulder while maintaining the neutral grip. Pause at the top of the movement and then slowly lower the weight in the reverse manner. Repeat the movement with the right arm. One curl with both arms equals one rep.

Seated Dumbbell Hammer Curl



START

Sit at the end of a flat bench or on a low-back bench with your feet planted firmly on the floor. Hold a pair of dumbbells with a neutral grip and let them hang at the sides of the bench.

MOVE

Slowly curl the dumbbells in an arc toward your shoulders while maintaining the neutral grip. Pause at the top of the movement and slowly lower the weight in the reverse manner.

Note: You can do this exercise as a seated alternating dumbbell curl.

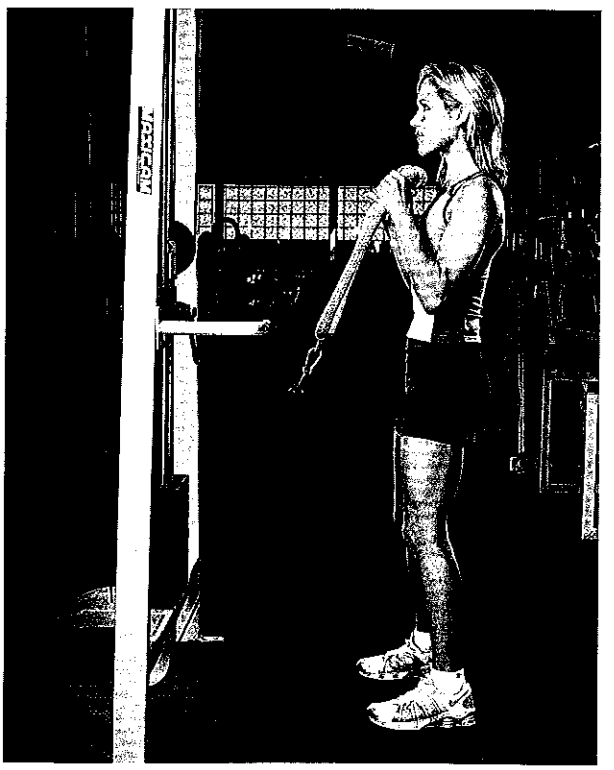
Rope Cable Hammer Curl

START

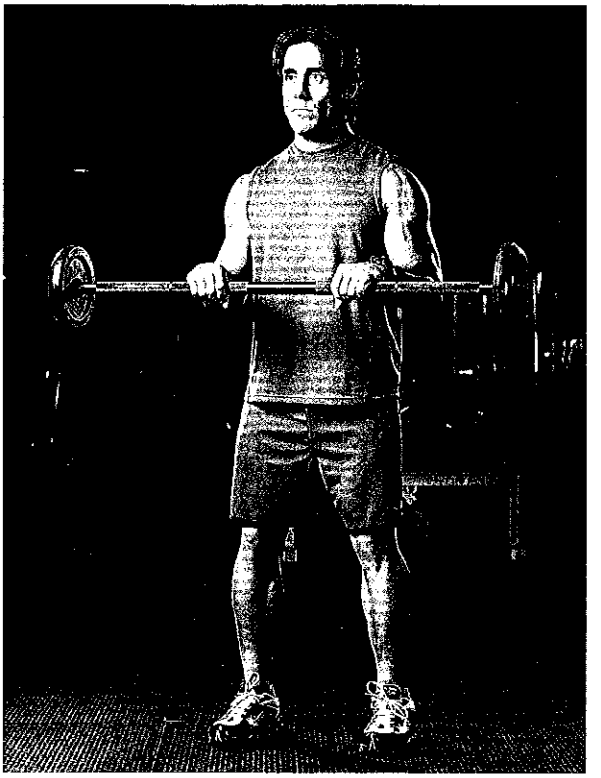
With a neutral grip, grasp a rope handle attached to the low pulley of a cable apparatus. Knees are slightly bent and feet are shoulder-width apart.

MOVE

Flex your arms and bend your elbows powerfully, keeping them stationary at your sides as you do so. Bring your hands all the way up to your shoulders (as close as you can without shifting your elbows forward) and pause for a second at the top. Lower the rope to the starting position.



Reverse-Grip Barbell Curl



START

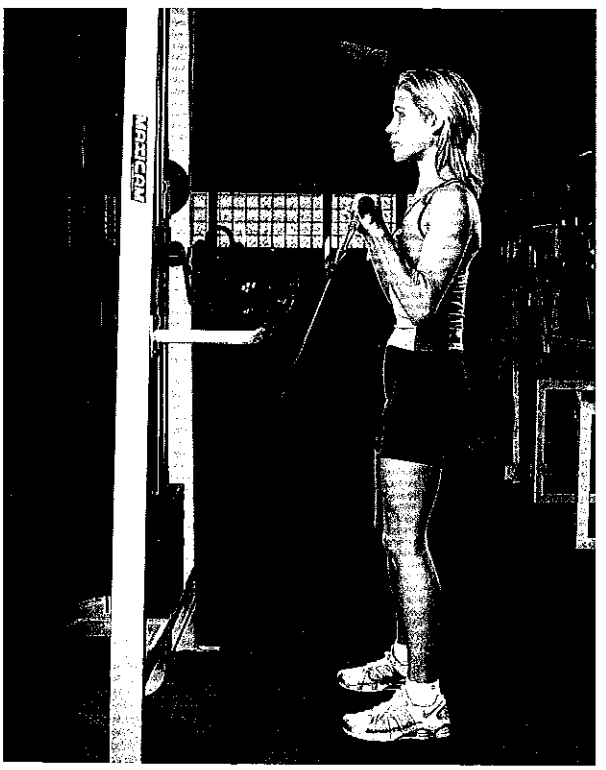
With your knees slightly bent and your feet about hip-width apart, grasp a barbell with a shoulder-width, overhand grip. Let the bar hang to your thighs. Keep your abs pulled in and your elbows stationary.

MOVE

Without swaying, slowly curl the bar in an arc toward your shoulders. Pause at the top of the movement and slowly lower the bar to the starting position.

Note: You can do this exercise with an EZ bar.

Reverse-Grip Cable Curl



START

Stand in front of a low-pulley cable with your knees slightly bent and your feet about hip-width apart. With an overhand shoulder-width grip, grab a straight bar attached to the low pulley. Hold the bar in front of your thighs and step back from the pulley about a foot (30.5 centimeters) to keep the weight plates from touching the bottom plate.

MOVE

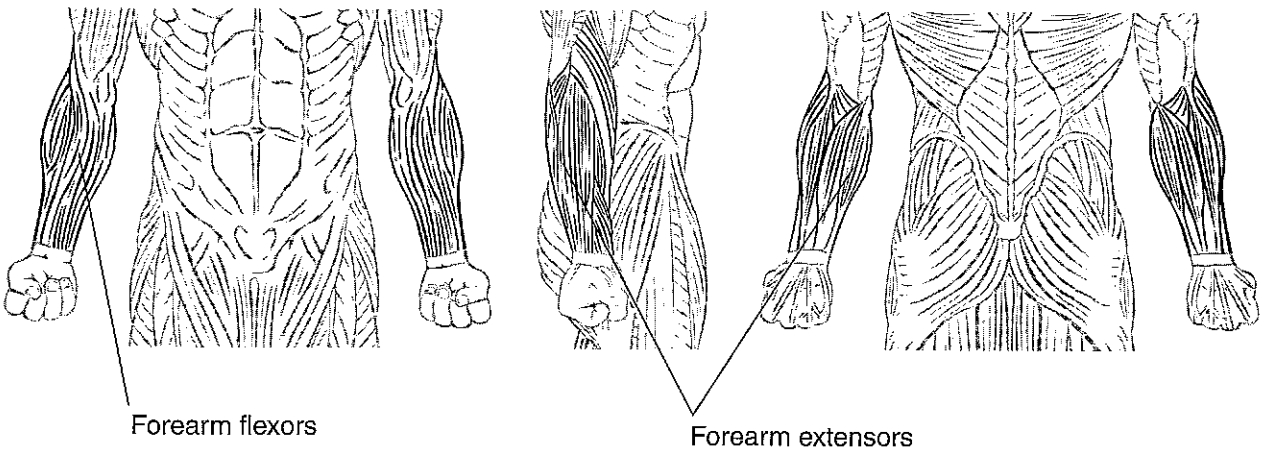
Curl the bar up in an arc toward your shoulders. Pause at the top of the movement and slowly lower the bar to the starting position.

Note: You can do this exercise with an EZ bar attachment.

CHAPTER 17

Forearms

This chapter contains detailed descriptions of all major exercises that focus on the forearm muscles, including the wrist flexors and wrist extensors. The forearm flexors are located on the front of the forearms, while the forearm extensors are located on the back of the forearm. See the diagram below for the location of each group. The forearm exercises are divided into wrist curl exercises, reverse wrist curl exercises, and grip exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.

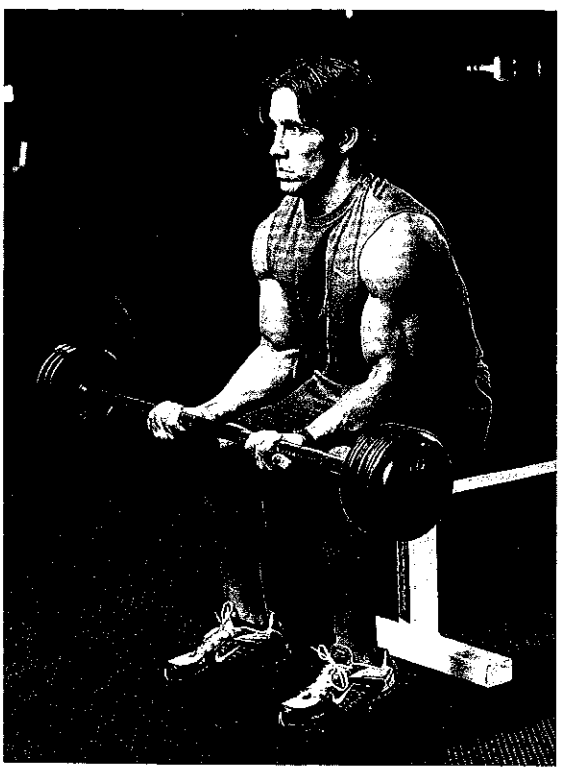


Wrist Curl Exercises

Reverse Wrist Curl Exercises

Grip Exercises

Barbell Wrist Curl



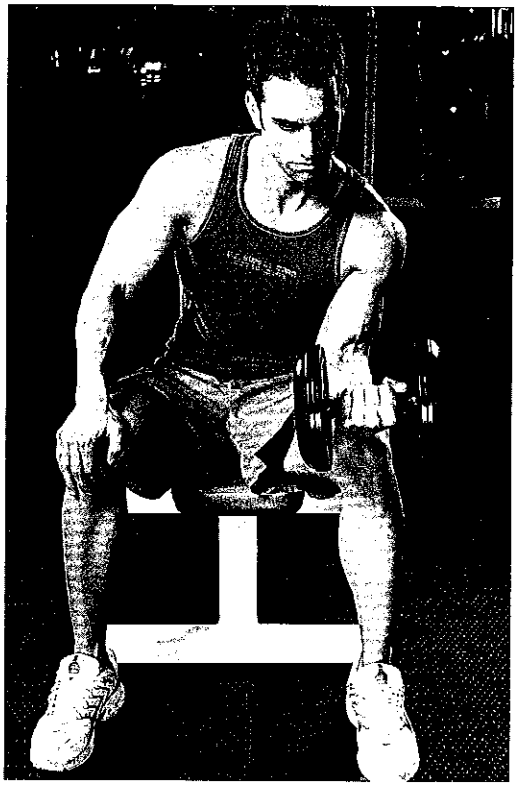
START

Sit at the end of a flat bench with your legs in front of you and feet flat on the floor, hip-width apart. While holding a barbell with a shoulder-width, underhand grip, rest your forearms on the tops of your thighs so that your wrists and hands hang off your knees. Extend your wrists so that your hands hang down from your wrists at about a 90-degree angle. The bar should be supported with just your fingers.

MOVE

Curl the weight up, starting with your fingers and then your wrists, until your wrists are flexed and your hands are as much past parallel with the floor as possible. Hold this position for a second while forcefully contracting your forearm muscles, then slowly return the bar back to the start in the reverse manner.

Dumbbell Wrist Curl



START

Sit at the end of a flat bench with your legs in front of you and feet flat on the floor, hip-width apart. While holding a dumbbell with an underhand grip in your left hand, rest your left forearm on top of your left thigh so that your wrist and hand hang off your knee. Extend your wrist so that your hand hangs down from your wrist at about a 90-degree angle. The dumbbell should be supported with just your fingers.

MOVE

Curl the weight up, starting with your fingers and then your wrist, until your wrist is flexed and your hand is as much past parallel with the floor as possible. Hold this position for a second while forcefully contracting your forearm muscles, then slowly return the dumbbell back to the start in the reverse manner. Complete the desired number of reps and repeat with the right arm.

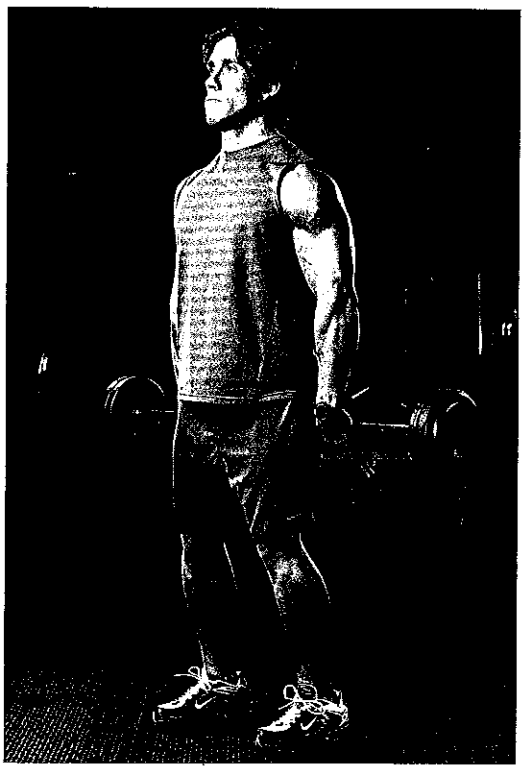
Standing Behind-the-Back Wrist Curl

START

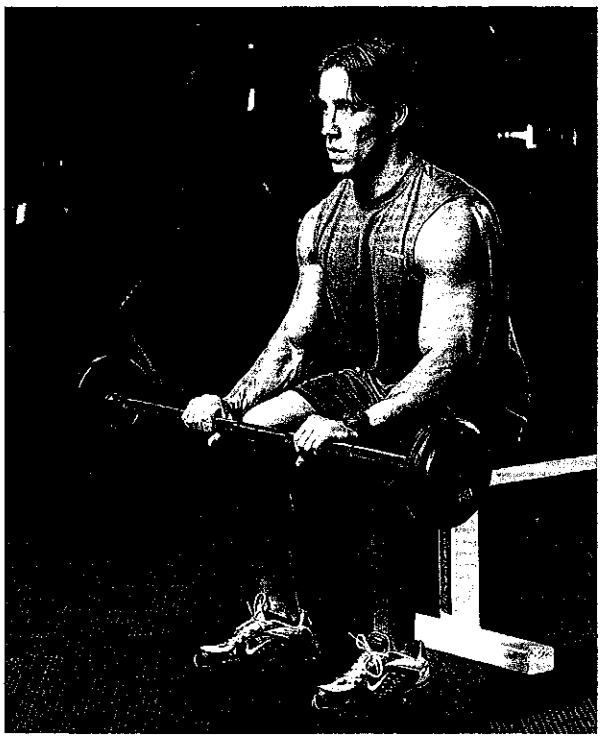
Stand while holding a barbell with an overhand grip behind your thighs. Both your hands and feet should be shoulder-width apart. The barbell should be supported with just your fingers.

MOVE

Curl the weight up, starting with your fingers and then your wrists, until your wrists are flexed and your hands are as close to parallel with the floor as possible. Hold this position for a second while forcefully contracting your forearm muscles, then slowly return the barbell back to the starting position.



Barbell Reverse Wrist Curl



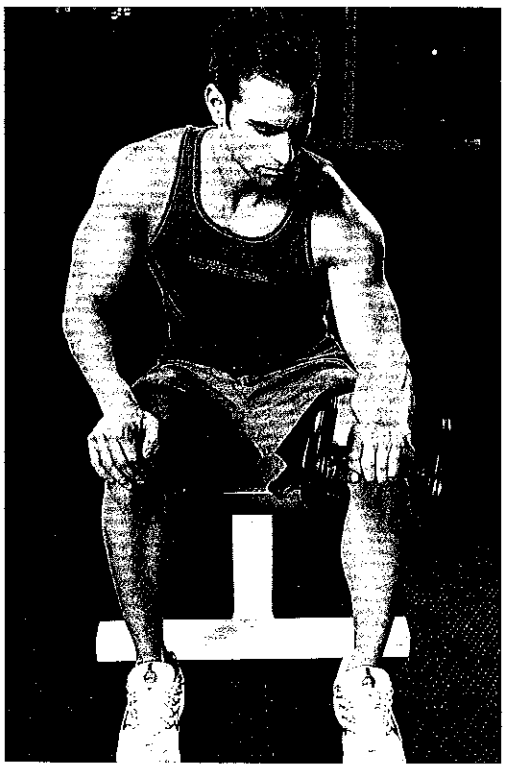
START

Sit at the end of a flat bench with your legs in front of you and feet flat on the floor, hip-width apart. While holding a barbell with a shoulder-width, overhand grip, rest your forearms on the tops of your thighs so that your wrists and hands hang off your knees. Flex your wrists so that your hands hang down from your wrists at about a 90-degree angle.

MOVE

Extend your wrists to lift the weight up as high as you can. Hold this position for a second while forcefully contracting your forearm muscles, then slowly return the bar back to the starting position.

Dumbbell Reverse Wrist Curl



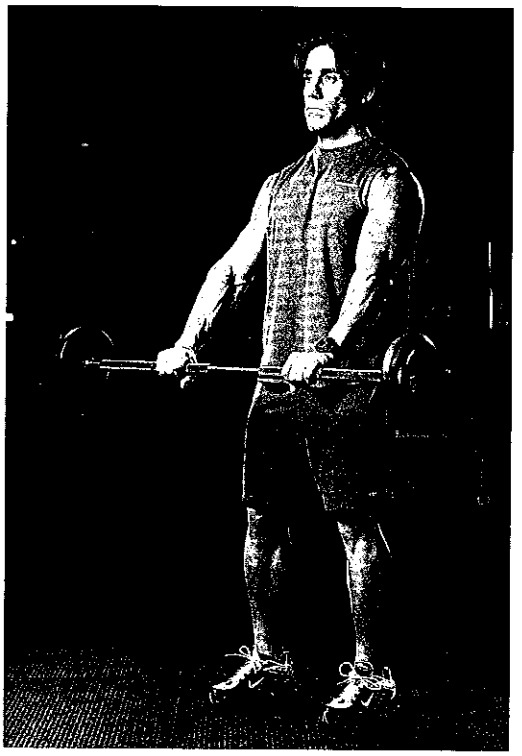
START

Sit at the end of a flat bench with your legs in front of you and feet flat on the floor, hip-width apart. Using an overhand grip to hold a dumbbell with your left hand, rest your forearm on the top of your left thigh so that your wrist and hand hang off your knee. Flex your wrist so that your hand hangs down from your wrist at about a 90-degree angle.

MOVE

Extend your wrist to lift the weight up as high as you can. Hold this position for a second while forcefully contracting your forearm muscles, then slowly return the dumbbell back to the starting position. Complete the desired number of reps and repeat with the right arm.

Standing Reverse Wrist Curl



START

While standing and using an overhand grip, hold a barbell about four to six inches (10 to 15 centimeters) in front of your thighs. Both your hands and feet should be shoulder-width apart.

MOVE

Extend your wrist to lift the weight up as high as you can. Hold this position for a second while forcefully contracting your forearm muscles, then slowly return the bar back to the starting position.

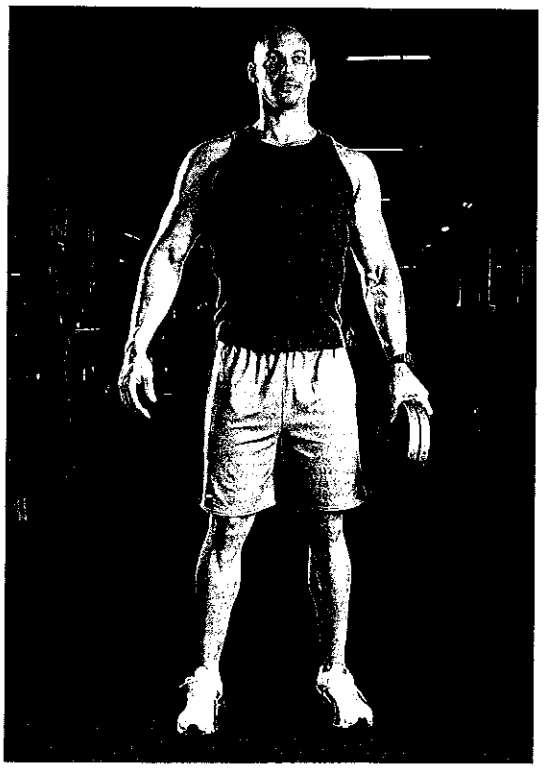
Weight Plate Pinch

START

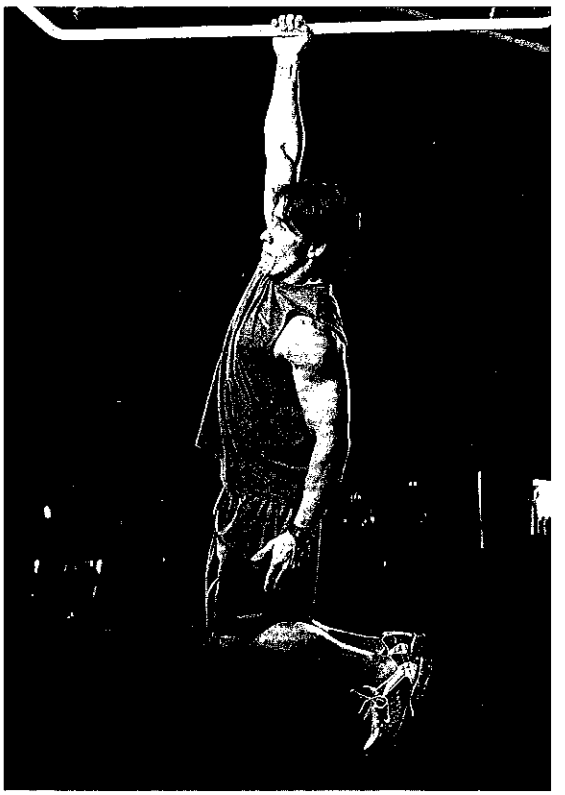
Take two equal-sized weight plates and place them together on their sides with the smooth sides out by your left foot. Hold them together with your left hand, placing your thumb on one side and your fingers on the other.

MOVE

Pick up the plates and hold them at the side of your left thigh, similar to a unilateral deadlift. Hold the plates in this position for several seconds and then return the plates to the floor without letting go until you have performed as many reps as desired. Repeat with the right hand.



Gorilla Hang



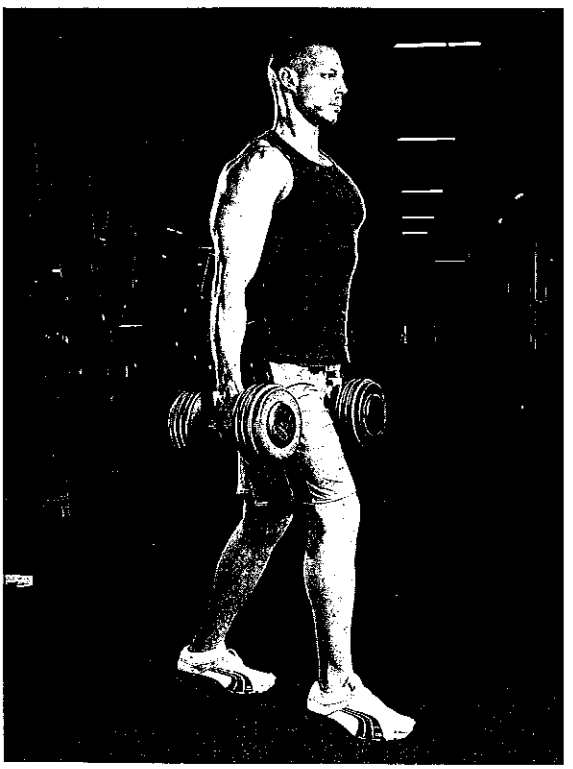
START

Grab on to a pull-up bar with just your right hand.

MOVE

Lift your feet off the floor and hang for as long as possible with your right hand. Repeat with your left hand.

Farmer's Walk



START

Using a neutral grip, hold on to two heavy dumbbells.

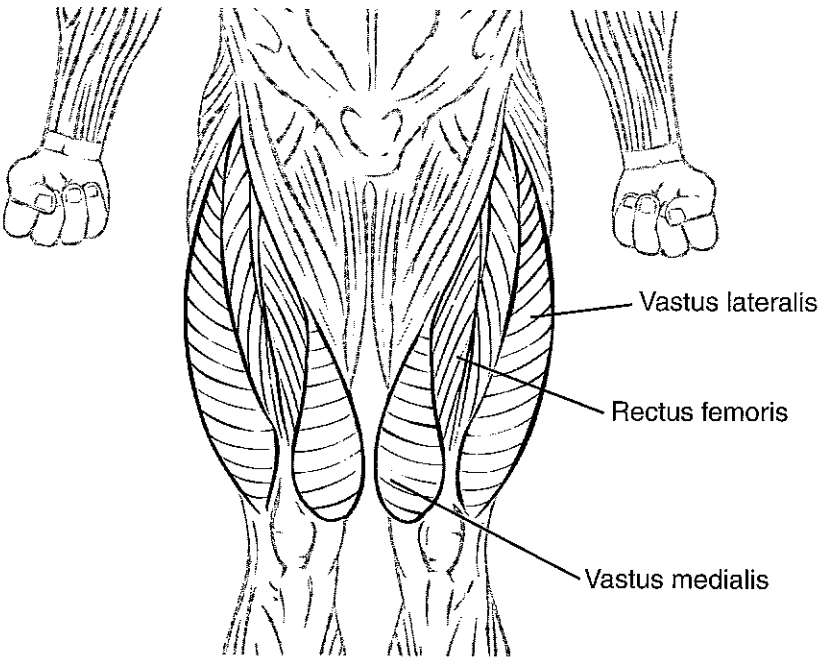
MOVE

Walk back and forth across the room as many times as you can while holding the dumbbells.

CHAPTER **18**

Quadriceps

This chapter contains detailed descriptions of all major exercises that focus on the quadriceps muscles, including the vastus lateralis, vastus medialis, vastus intermedius, and rectus femoris. See the diagram below for the location of each quadriceps muscle. The vastus intermedius cannot be seen in this diagram because it lies underneath the rectus femoris. The quadriceps exercises are divided into squat exercises, leg press and machine squat exercises, lunge and step exercises, and leg extension exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



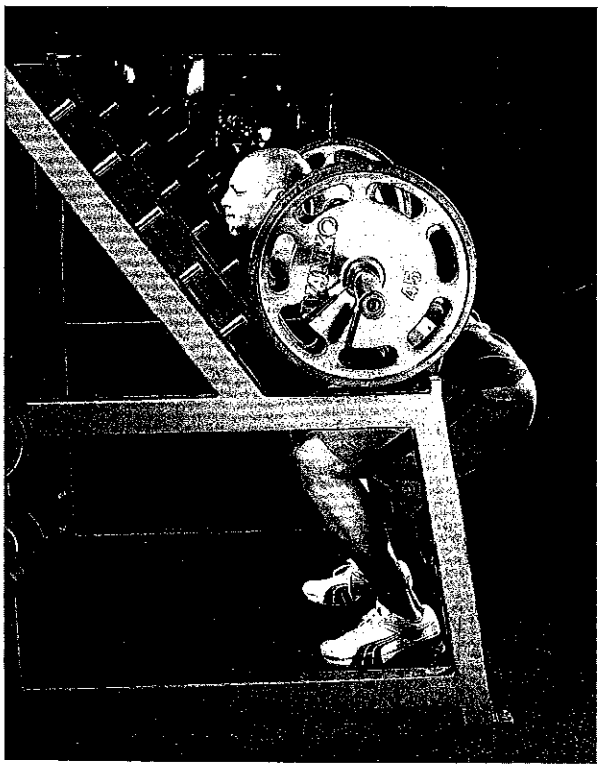
Squat Exercises

Leg Press and Machine Squat Exercises

Lunge and Step Exercises

Leg Extension Exercises

Barbell Squat



START

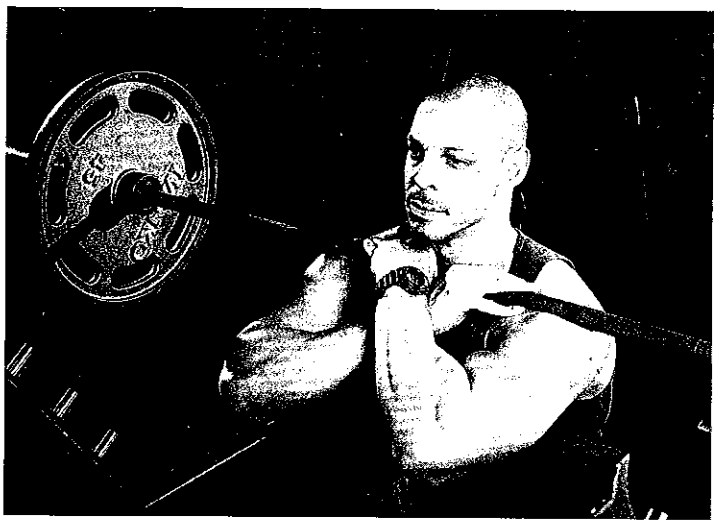
Stand with a barbell rested on your shoulders and traps. Both your hands and your feet should be about shoulder-width apart. Maintain the natural arch in your lower back and keep your head directed forward.

MOVE

Bend at the knees and hips, letting your glutes track backward to lower yourself. At the point where your thighs are parallel to the floor, reverse direction, driving up forcefully through your heels to a standing position.

Note: For a detailed description of using the squat for maximal strength, see chapter 8, page 152.

Barbell Front Squat



START

Stand with a barbell rested on your shoulders and upper chest, holding with either an Olympic-style grip or cross-grip. Both your hands and your feet should be about shoulder-width apart. Maintain the natural arch in your lower back and keep your head directed forward.

MOVE

Perform a basic squat, bending your knees and driving your hips back to lower yourself until your thighs are parallel to the floor. Then forcefully extend your legs to stand back up to the starting position.

Smith Machine Squat

START

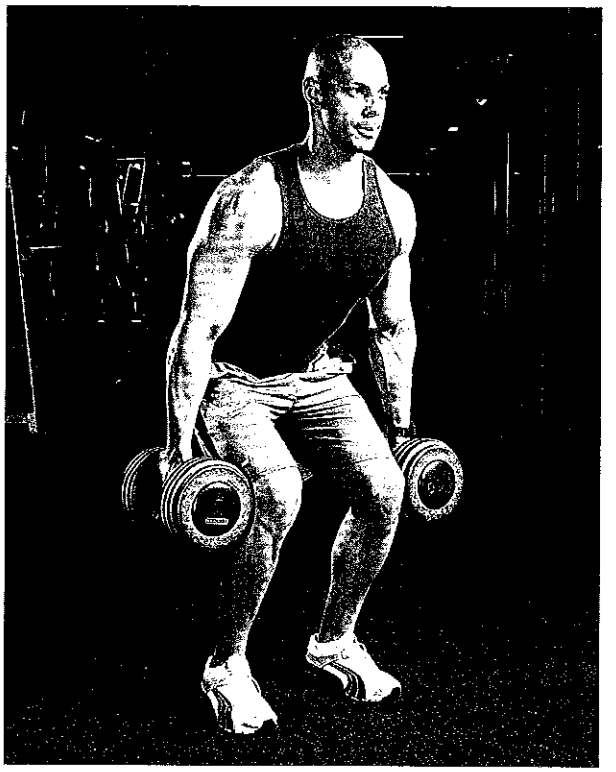
Stand in a Smith machine with the bar across your shoulders and traps, grasping it just outside your shoulders. Twist the bar to unrack it.

MOVE

With your chest high, head forward, and back slightly arched, bend your knees and hips as if you're sitting back in a chair until your thighs are parallel to the floor. Reverse the motion by driving through your heels and pressing your hips forward to return to the starting position.

Note: You can also do this exercise as a front squat.

Dumbbell Squat



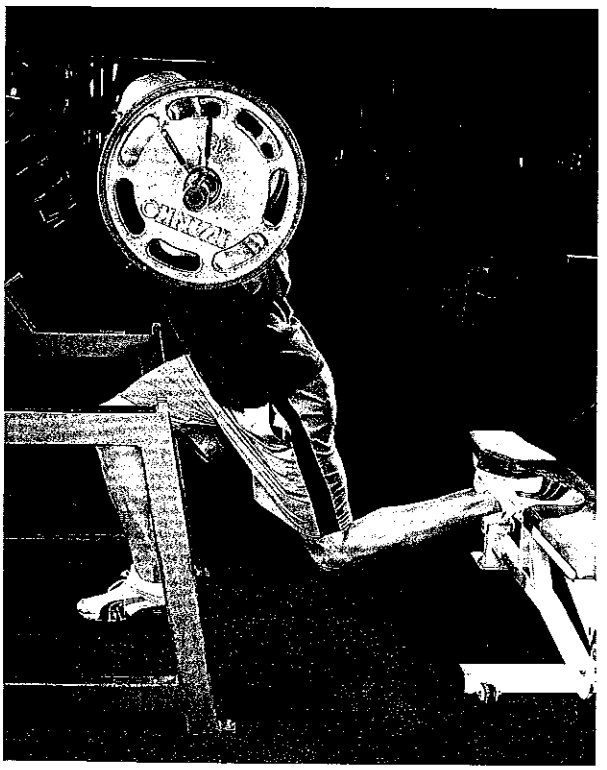
START

Stand while holding two dumbbells in a shoulder-width, neutral grip by your sides. Maintain the natural arch in your lower back and keep your head directed forward.

MOVE

Bend at the knees and hips, letting your glutes track backward to lower yourself. At the point where your thighs are parallel to the floor, reverse direction, driving up forcefully through your heels to a standing position.

One-Leg Squat



START

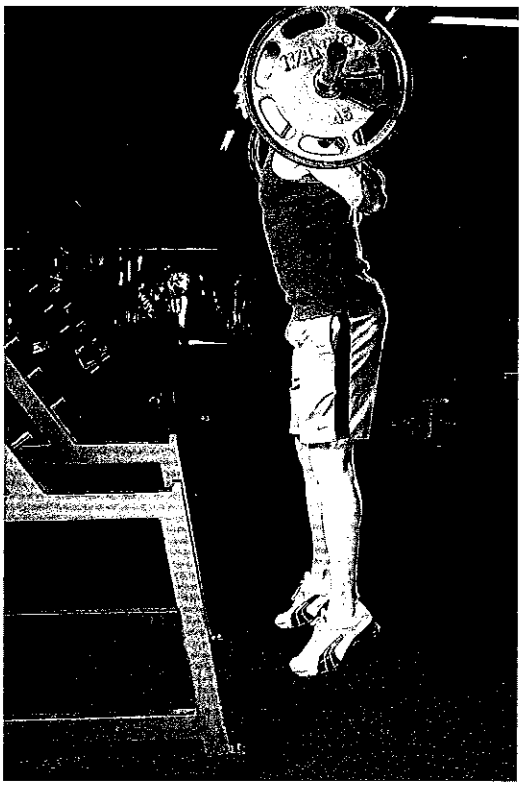
Stand with a barbell rested on your shoulders and traps, holding it with a shoulder-width grip. Rest the top of your left foot on a flat bench placed two to three feet (half a meter to one meter) behind you. Maintain the natural arch in your lower back and keep your head directed forward.

MOVE

Bend your right knee and hip to lower your body until your right thigh is parallel to the floor. Reverse the direction, driving up forcefully through the right heel to the starting position. Perform the desired number of reps and then repeat with the left leg.

Note: You can do this exercise with dumbbells.

Squat Jump



START

Stand with a barbell rested on your shoulders and traps. Both your hands and your feet should be about shoulder-width apart. Maintain the natural arch in your low back and keep your head directed forward.

MOVE

Bend at the knees and hips, letting your glutes track backward to lower yourself. At the point where your thighs are parallel to the floor, reverse direction, driving up explosively through your heels and the balls of your feet to lift your body off the floor as high as possible. Land with soft knees and immediately lower into the next rep.

Note: You can do this exercise with dumbbells.

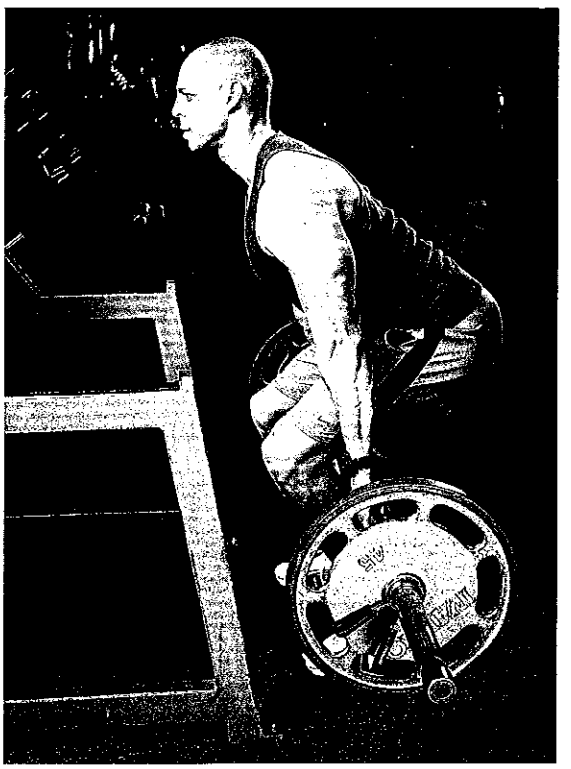
Barbell Hack Squat

START

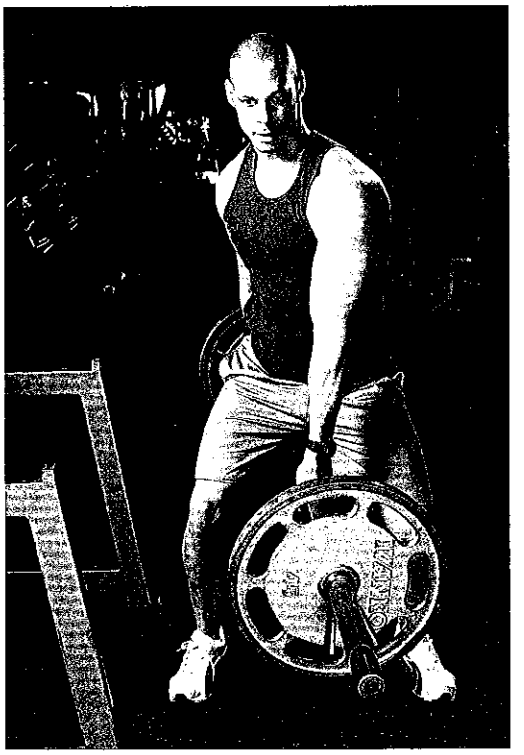
Stand with feet shoulder-width apart. Using a shoulder-width grip, hold a barbell behind your thighs. Maintain the natural arch in your lower back and keep your head directed forward.

MOVE

Bend at the knees and hips, letting your glutes track backward to lower yourself. At the point where your thighs are parallel to the floor or the bar touches the floor, reverse direction, driving up forcefully through your heels to a standing position.



Jefferson Squat



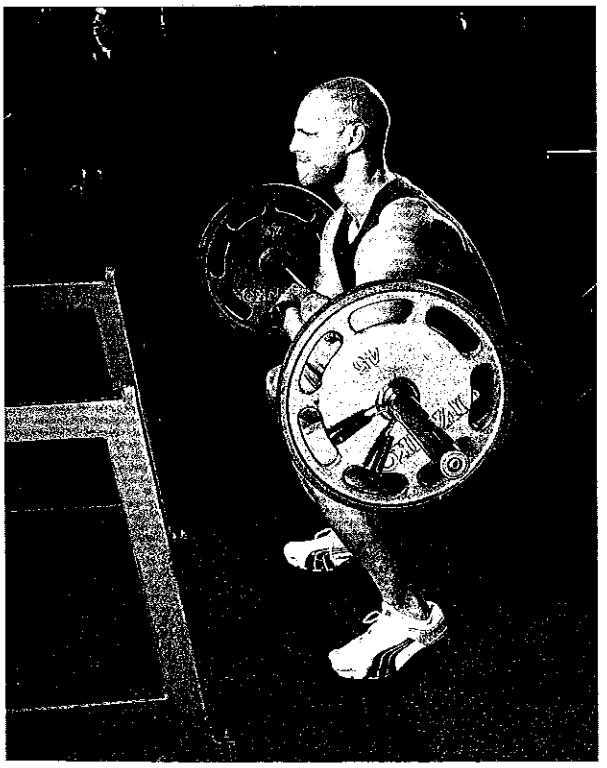
START

Straddle a loaded barbell placed on the floor and running lengthwise between your feet. Squat down to pick up the bar, grabbing it with one hand in front of you and one hand behind you. Hold the bar as you stand with a grip that's wider than shoulder width.

MOVE

Bend at the knees and hips, letting your glutes track backward to lower yourself. At the point where your thighs are parallel to the floor or the bar touches the floor, reverse direction, driving up forcefully through your heels to a standing position.

Zercher Squat



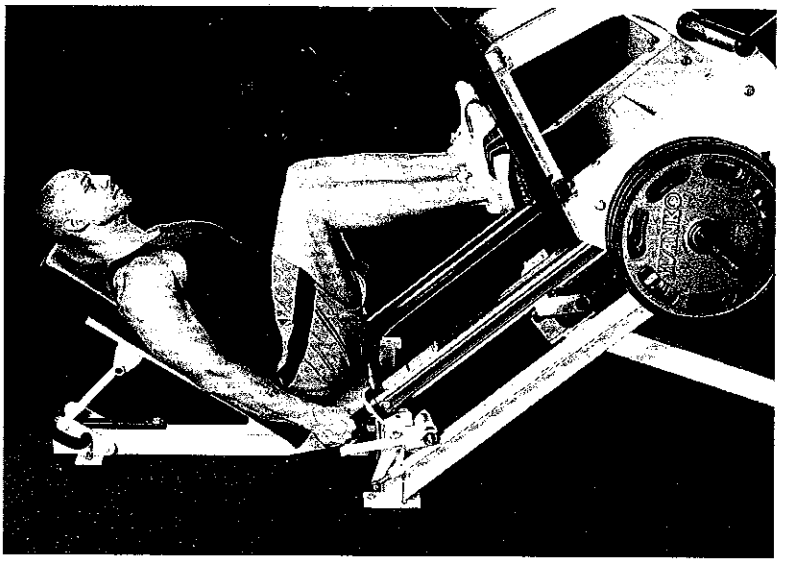
START

Stand with a shoulder-width grip while holding a barbell at waist height in the crook of your crossed arms.

MOVE

Bend at the knees and hips, letting your glutes track backward to lower yourself. At the point where your thighs are parallel to the floor, reverse direction, driving up forcefully through your heels to the standing position.

Leg Press



START

Sit in an angled leg press machine and place your feet shoulder-width apart in the center of the foot plate. Unhook the safety stoppers and support the weight with your legs.

MOVE

Slowly lower the weight, bringing your knees toward your chest but stopping when your knees are at a 90-degree angle. Pause a moment before pressing through your heels to return the weight to the starting position at full leg extension but without locking out at the knees.

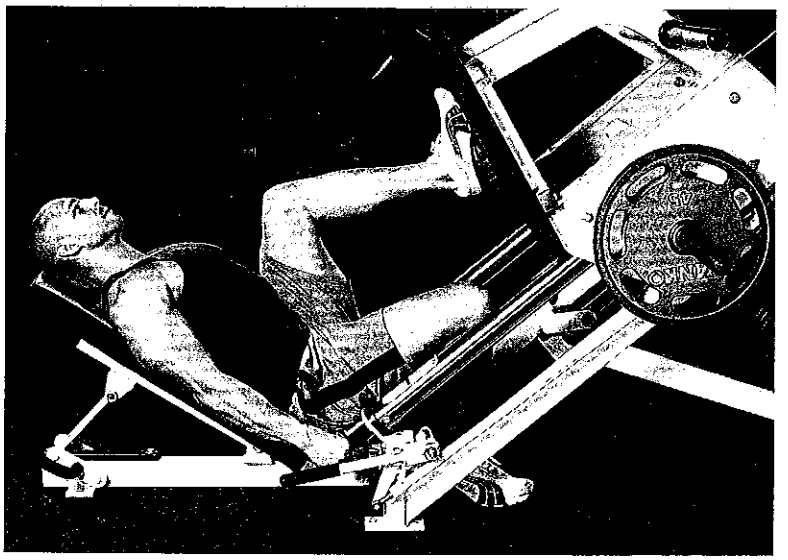
One-Leg Leg Press

START

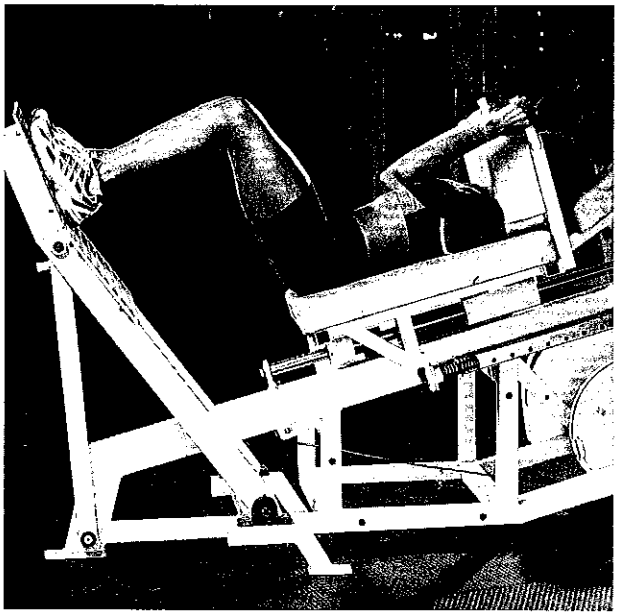
Sit in a leg press machine and place your left foot in the middle of the platform, keeping the right foot flat on the floor for stability. Unhook the safety stoppers and support the weight with your left leg.

MOVE

Slowly lower the weight, bringing your left knee toward your chest but stopping when your knee is at a 90-degree angle. Pause a moment before pressing through your heel to return the weight to the starting position at full leg extension but without locking out at the knee. Perform the desired number of reps and then repeat with the right leg.



Horizontal Leg Press



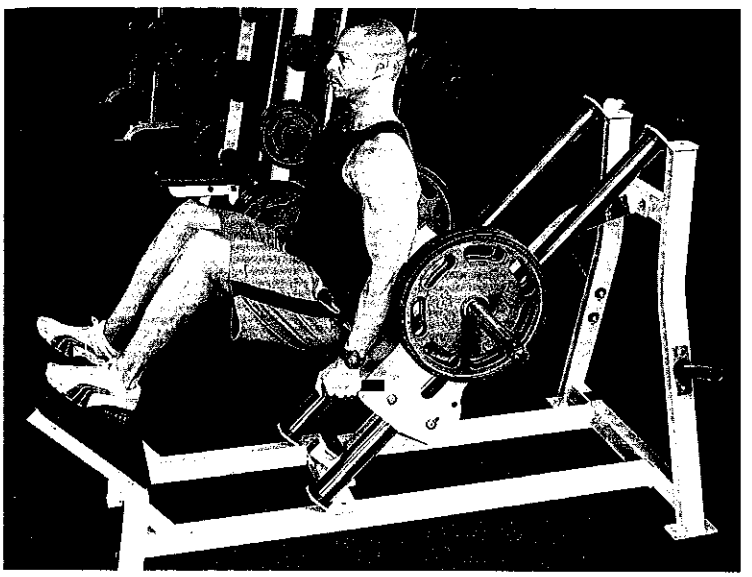
START

Lie in a horizontal leg press machine with your back flat against the pad and your shoulders snug under the shoulder pads. Place your feet shoulder-width apart in the center of the foot plate. Unhook the safety stopper and support the weight with your legs.

MOVE

Slowly lower yourself toward the foot plate, bringing your knees toward your chest but stopping when your knees are at a 90-degree angle. Pause a moment before pressing through your heels to return the weight to the starting position at full leg extension but without locking out the knees.

Hack Squat



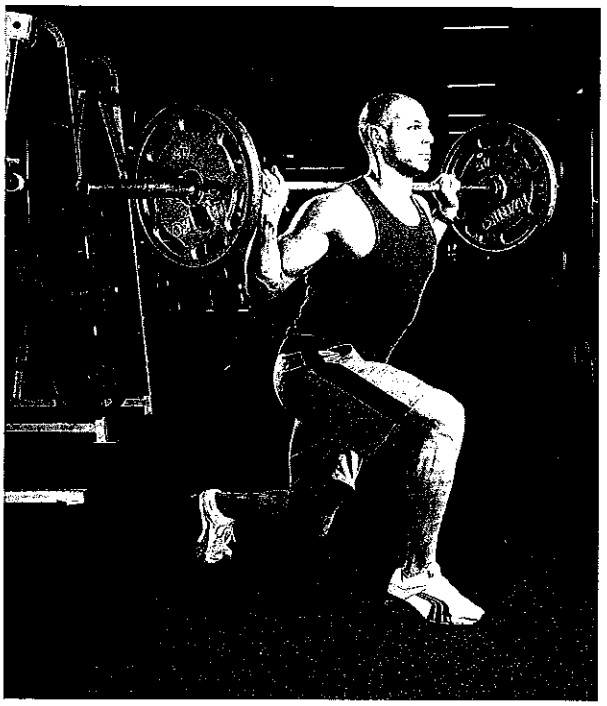
START

Stand in a hack squat machine with your feet hip-width apart in the middle of the foot plate. Unhook the safety stopper and support the weight with your legs.

MOVE

Slowly squat down until your hips and knees are at or just below a 90-degree angle. From there, stand back up by pressing through your heels to lift the weight to an upright position. Come almost to a full extension at the top without locking out your knees.

Lunge



START

Support a barbell across your shoulders and traps and hold it with a shoulder-width grip while standing with your feet together. Keep your head directed forward and maintain the arch in your low back.

MOVE

Step forward with your right foot, leading with your heel, and lunge down toward the floor, maintaining control over the speed of your descent. Lower yourself until your left knee almost touches the floor. Push back off your right foot, returning to the starting position. Repeat with the left leg and alternate reps.

Note: You can do this exercise with dumbbells.

Walking Lunge

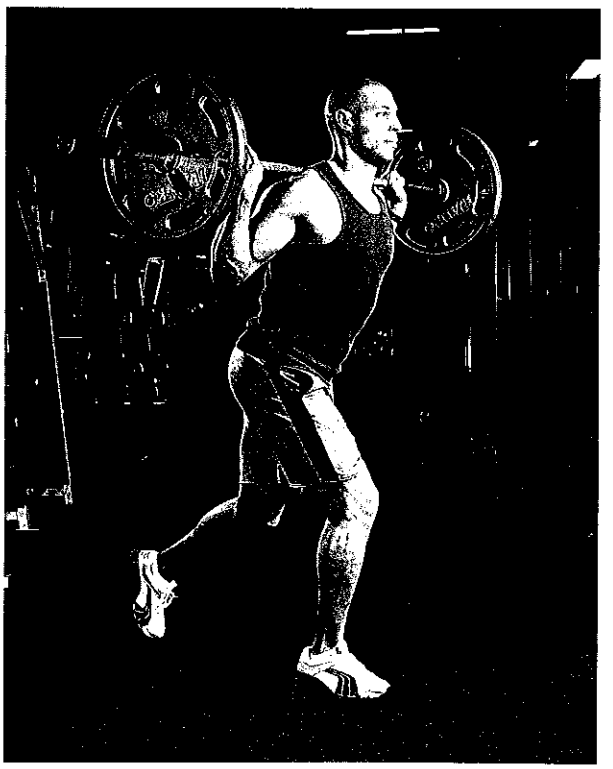
START

Support a barbell across your shoulders and traps and hold it with a shoulder-width grip while standing with your feet together. Keep your head directed forward and maintain the arch in your low back.

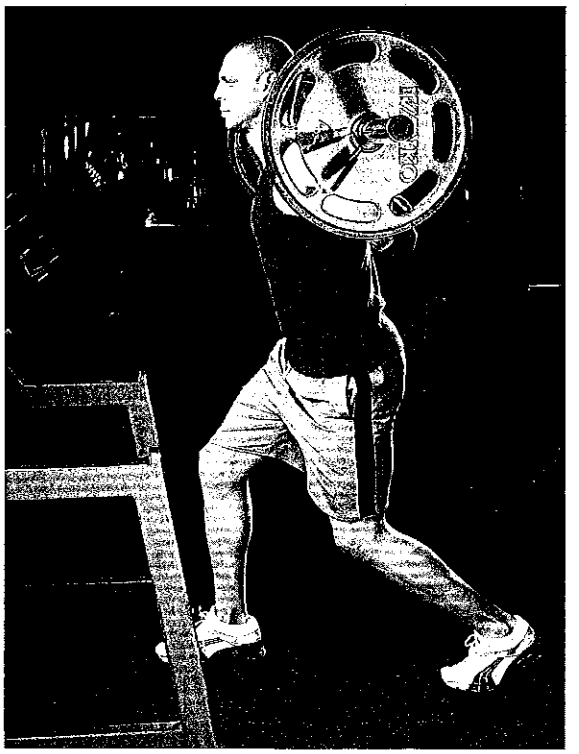
MOVE

Step forward with your right foot, leading with your heel, and lunge down toward the floor, maintaining control over the speed of your descent. Lower yourself until your left knee almost touches the floor. Lift yourself up and toward your right foot by pulling with your right leg. Come to a standing position with both feet together and repeat the motion with your left leg. Alternate legs with each rep.

Note: You can do this exercise with dumbbells.



Split Squat



START

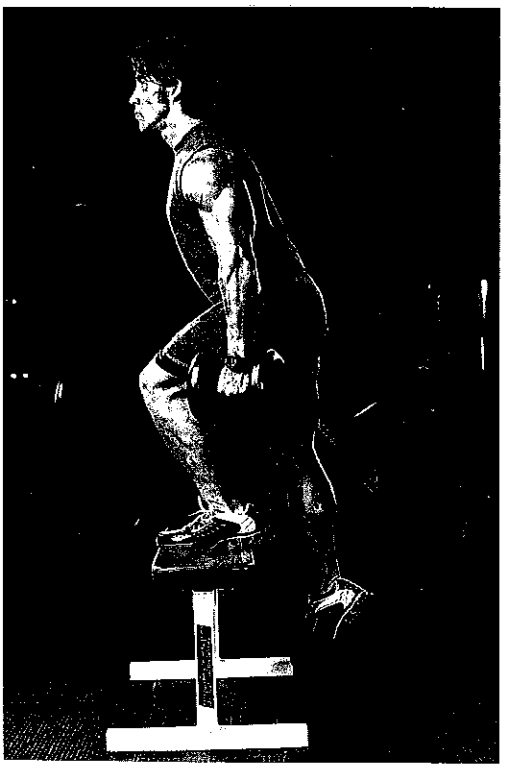
Support a barbell across your shoulders and traps and hold it with a shoulder-width grip while standing with your feet together. Keep your head directed forward and maintain the arch in your low back. Take a large step forward with your right leg. Your left heel will lift off the floor.

MOVE

Drop your body downward by bending your right knee and lowering your left knee toward the floor. Reverse the motion and press back up into a standing split squat. Complete all reps for the right side, then switch to the left side.

Note: You can do this exercise with dumbbells.

Step-Up



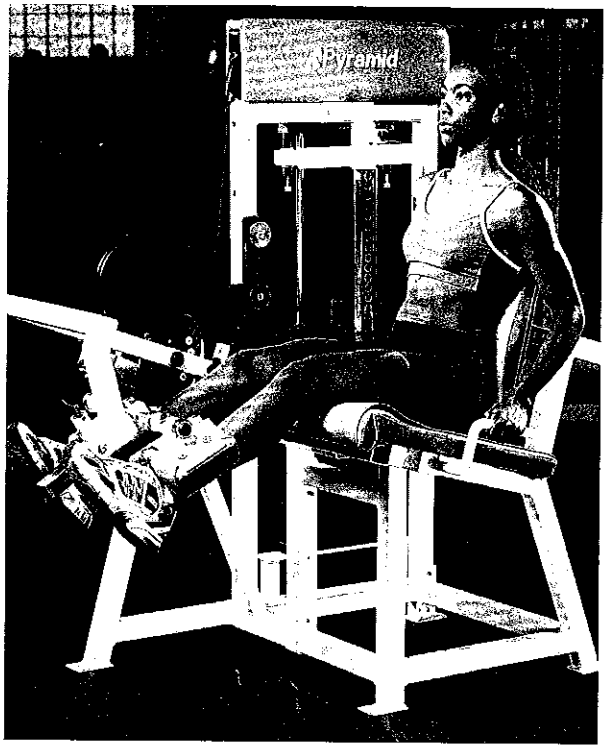
START

Place a knee-high step or bench in front of you and grasp a dumbbell in each hand. Stand with your feet in a comfortable hip-width stance.

MOVE

Step forward with one leg onto the step and drive through that thigh to bring your body upward. Bring the trailing leg to the top of the step and stand on the box, then step back with the opposite leg to the floor and lower yourself. Be sure to keep your low back in its natural arch and your upper body upright throughout the whole movement. Alternate legs with each rep.

Leg Extension



START

Adjust the seat back and footpad of a leg extension machine so that when you sit in it your knees are at the edge of the bench and your ankles are just below the footpad or rollers. Sit back with your back pressed firmly against the back pad.

MOVE

Grasp the handles or the seat edges behind your hips and keep your upper body stable as you extend your legs in a smooth movement until fully extended. Contract your quads at the top and slowly lower the weight under control to the starting position.

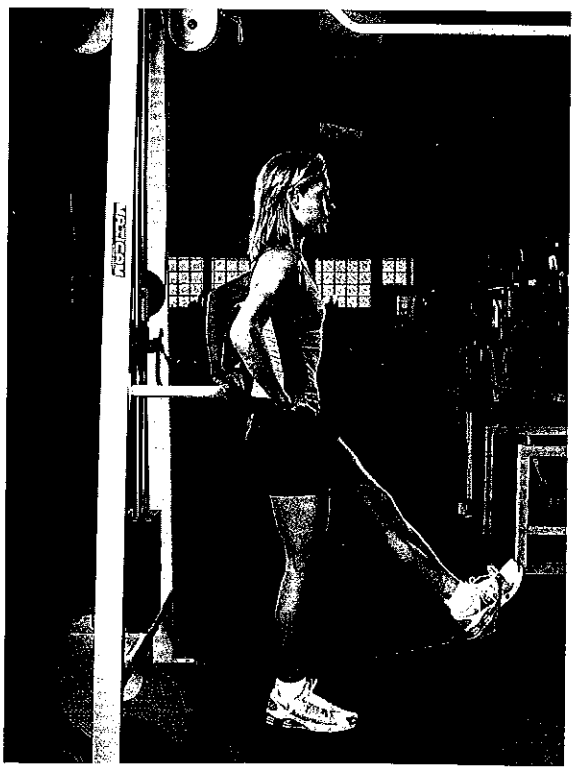
Cable Leg Extension

START

Attach an ankle cuff to your left ankle and connect it to a low-pulley cable. Grab on to the cable apparatus for support and lift your thigh to form a 45-degree angle with your hip. Your lower leg should form a 90-degree angle at the knee.

MOVE

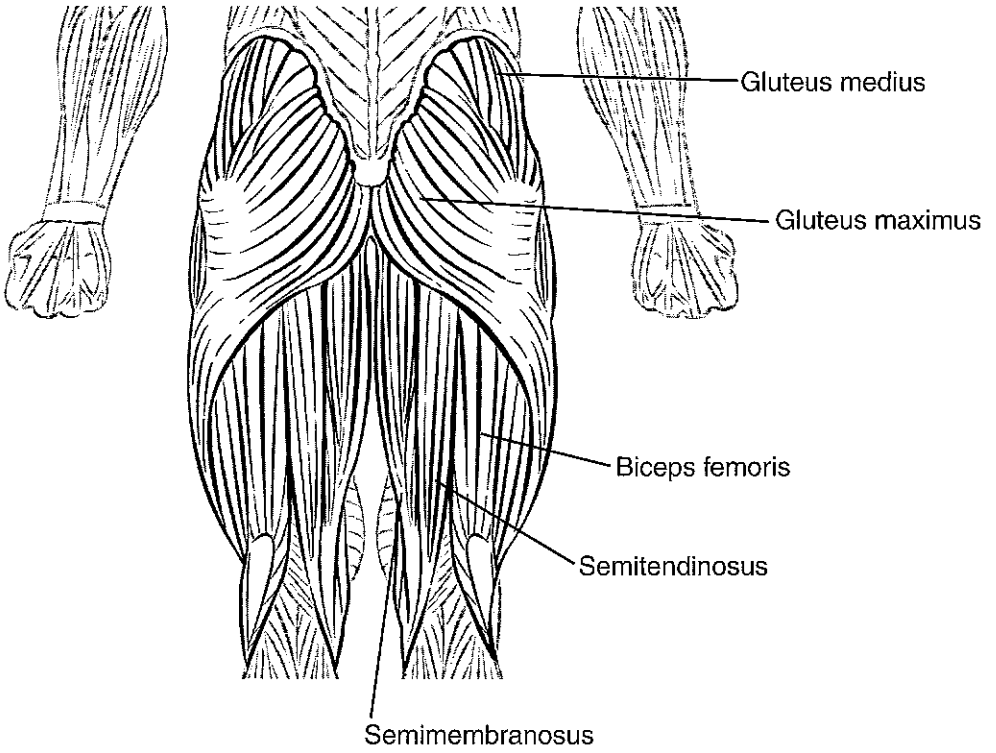
Kick your lower leg forward and up until your leg is fully extended. Contract the quad muscles for a second and then return your foot to the starting position. Complete the desired number of reps and repeat with the right leg.



CHAPTER **19**

Hamstrings and Glutes

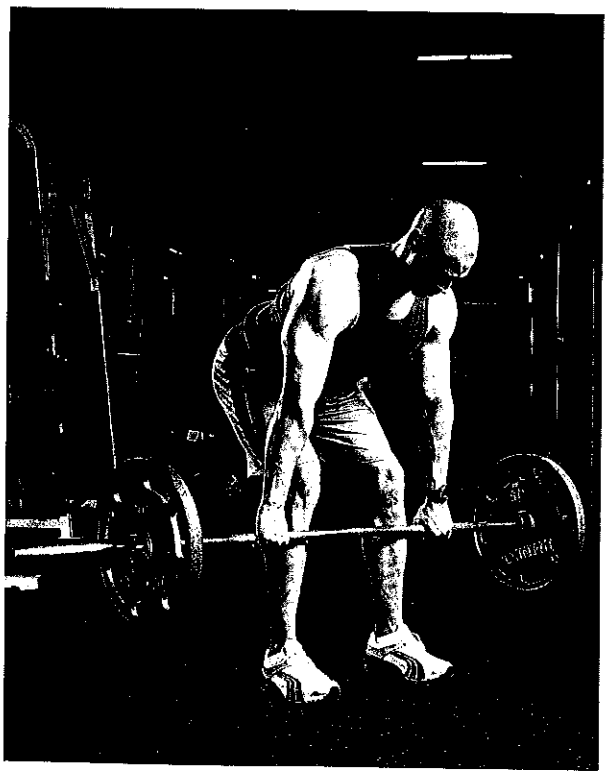
This chapter contains detailed descriptions of all major exercises that focus on the hamstrings and gluteal (glute) muscles, including the biceps femoris, semitendinosus, semimembranosus, gluteus maximus, and gluteus medius. See the diagram below for the location of each of these muscles. The hamstring and glute exercises are divided into hip extension exercises and leg curl exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Hip Extension Exercises

Leg Curl Exercises

Romanian Deadlift



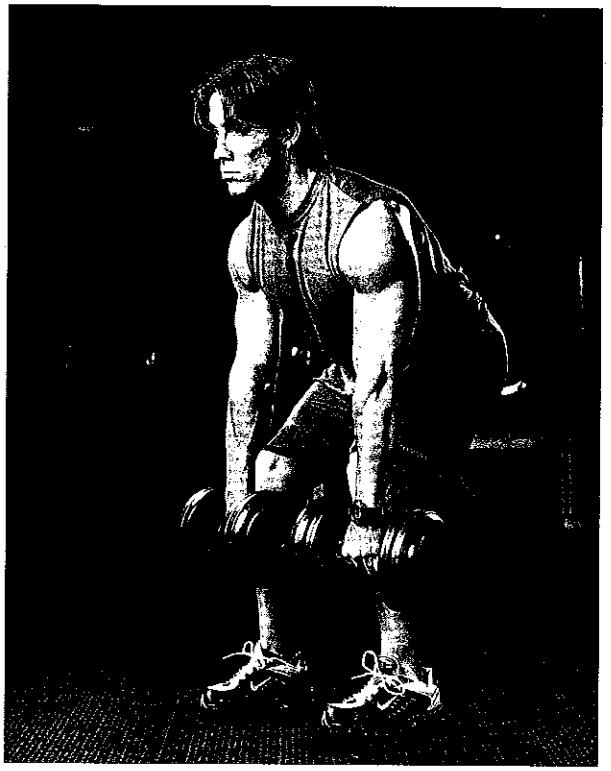
START

Stand with your feet shoulder-width apart and knees slightly bent. Using an overhand, shoulder-width grip, hold a barbell in both hands in front of your thighs.

MOVE

Lean forward from your hips, pushing your hips back as you guide the bar down your legs until the bar is at mid-shin height. Slowly extend at the hips to raise the bar back to the starting position.

Dumbbell Romanian Deadlift



START

Stand with your feet shoulder-width apart and your knees slightly bent. Using an overhand grip, hold a pair of dumbbells in both hands in front of your thighs.

MOVE

Lean forward from your hips, pushing your hips back as you guide the dumbbells down your legs until they are mid-shin height. Slowly extend at the hips to raise the weights back to the starting position.

Glute and Ham Raise

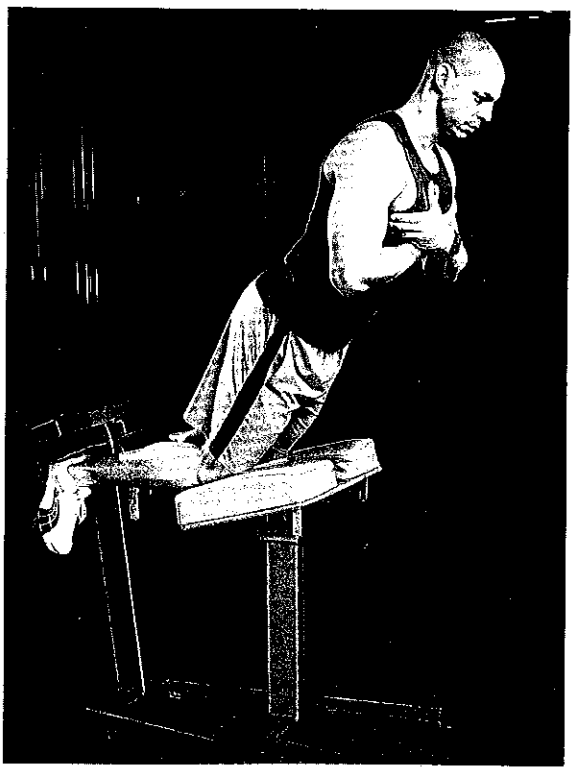
START

Kneel on the floor on a pad to protect your knees. Position your ankles underneath a stable structure or have a training partner hold your ankles down. Your torso and thighs should be straight while your lower legs are at a 90-degree angle to the thighs.

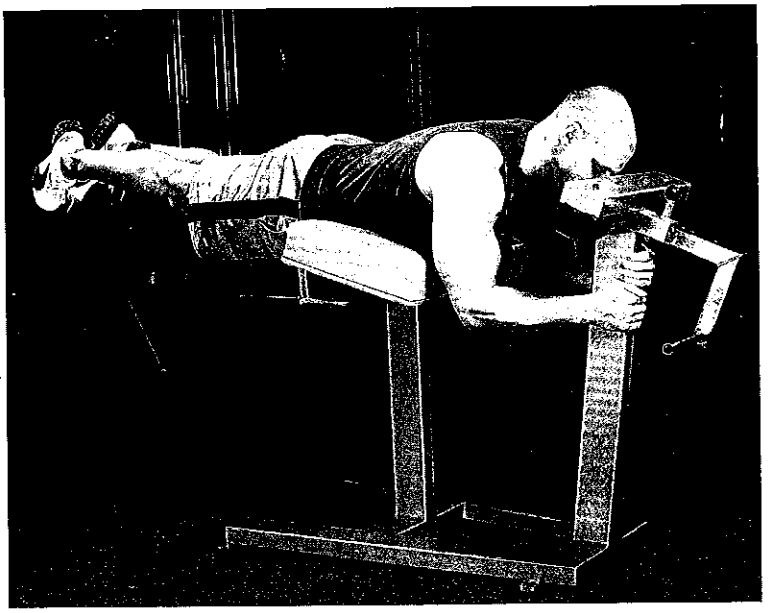
MOVE

Slowly extend your legs by lowering your torso and thighs as one unit forward toward the floor. Flex your hamstrings to bring your body back up to vertical.

Note: There is an apparatus known as a glute and ham raise that is designed specifically for this exercise. However, very few gyms have this apparatus.



Reverse Hamstring Extension



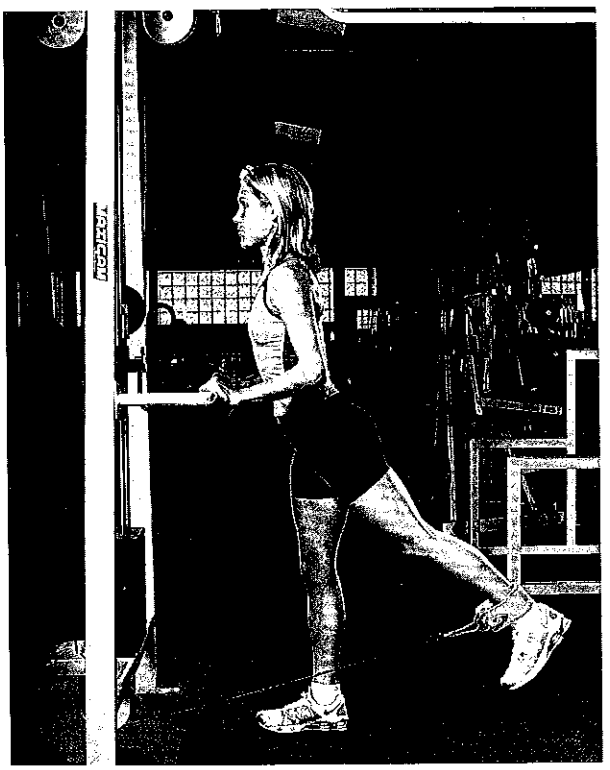
START

Lie facedown on a horizontal back extension bench. Hold the footpads with your arms to support your torso on the pad. Your hips and legs should hang off the end of the pad at a 90-degree angle.

MOVE

Extend at the hips to raise your legs up to parallel with the floor. Hold this position for a second, then reverse the motion to lower your legs back to the starting position.

Cable Hamstring Raise



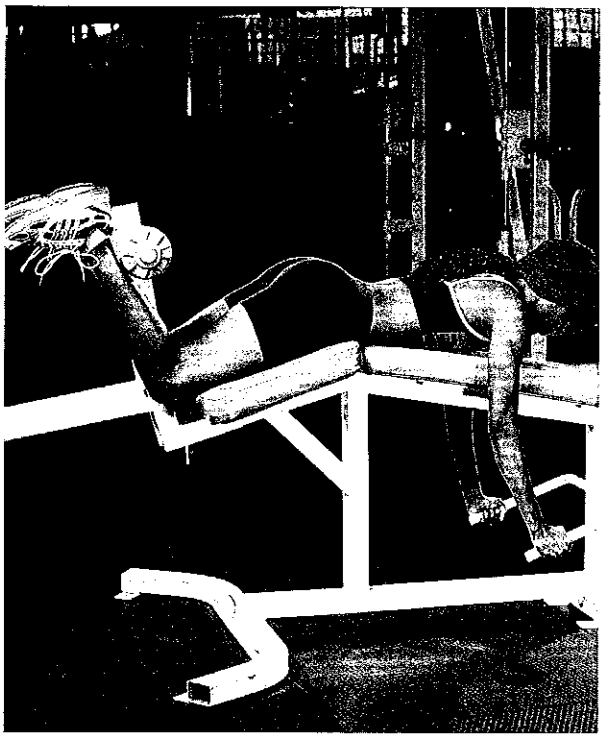
START

Stand facing a low-pulley cable with an ankle collar attached to your left ankle and connected to the low pulley. Hold the cable apparatus for support.

MOVE

Keeping your back straight, kick your left leg back behind you and as high up as possible. Hold it in the top position for a second before lowering the leg to the starting position. Complete the desired number of reps and repeat with the right leg.

Lying Leg Curl



START

Lie facedown on a leg curl machine. Position your Achilles tendons below the padded lever and place your knees just off the edge of the bench. Grasp the bench or the handles for stability. Make sure your knees are slightly bent to protect them from overextension.

MOVE

Keeping your hips down on the bench, use your hamstrings to flex your knees and raise your feet toward your glutes. Squeeze the hamstrings at the top, then lower the lever arm to the starting position.

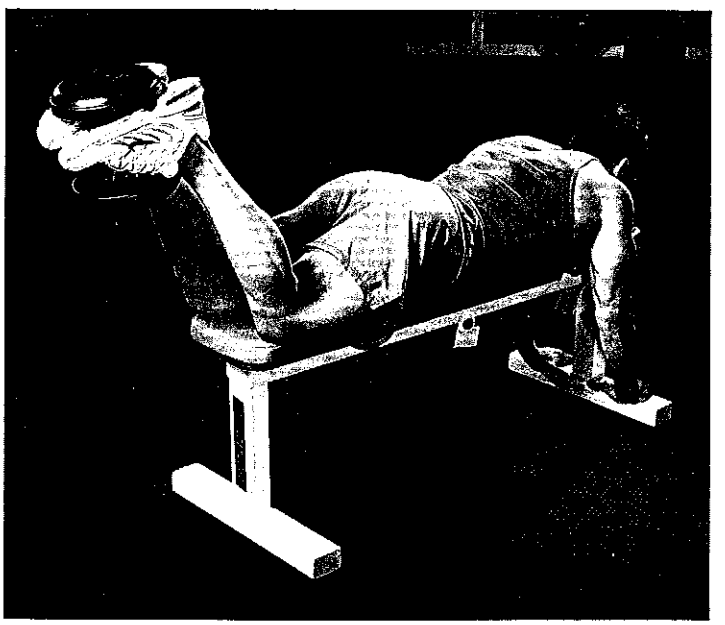
Lying Dumbbell Leg Curl

START

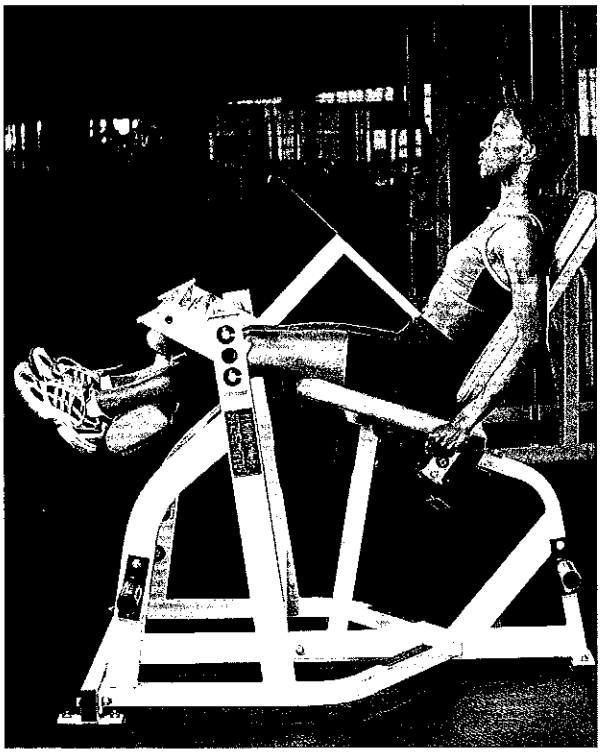
Place a dumbbell between your feet and lie down on a flat bench with your legs fully extended. Hold on to the edge of the pad or the legs of the bench for stability.

MOVE

Slowly bring the weight up by flexing your knees until your lower legs are just short of vertical. Slowly lower the dumbbell back to the starting position.



Seated Leg Curl



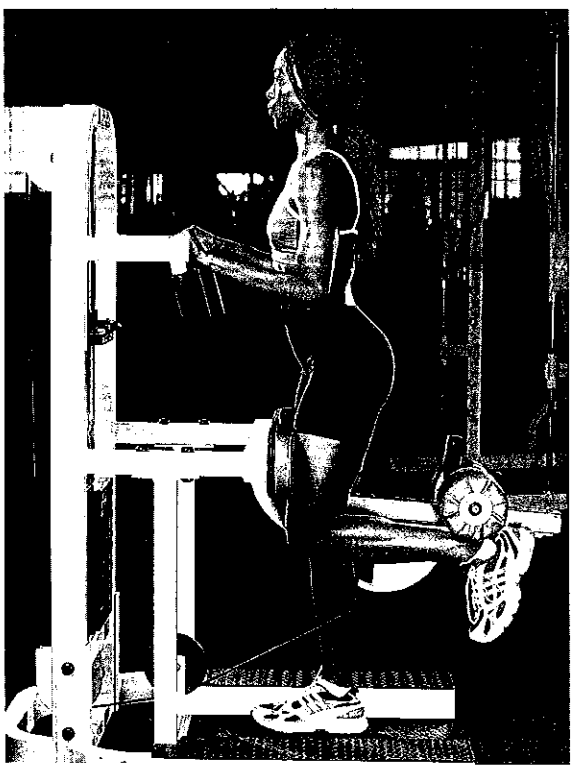
START

Sit in a seated leg curl machine with your knees just past the bench and your ankles placed on the ankle pad. Hold the handles to support your body.

MOVE

Curl your lower legs under you by flexing at the knees to bring your feet as close to the bottom of the bench as possible. Hold this position for a second and squeeze your hamstrings hard. Return your feet to the starting position.

Standing Leg Curl



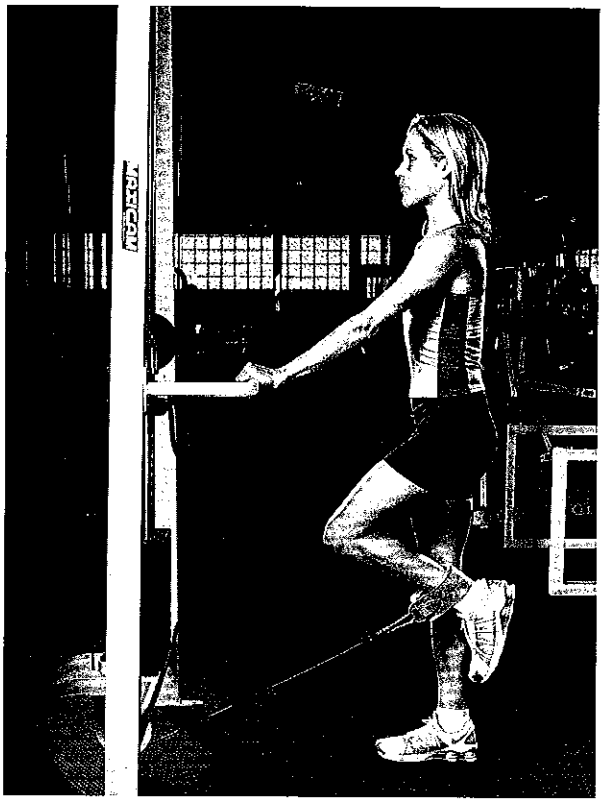
START

Using either a standing or supported one-leg curl machine, step into the machine with your left leg under the pad. Hold on to the handles to stabilize your body.

MOVE

Curl the weight up slowly as high as you can and squeeze your hamstrings at the top. Slowly lower the weight to the starting position. Complete the desired number of reps and repeat with the right leg.

Cable Leg Curl



START

Stand facing a low-pulley cable with an ankle collar attached to your left ankle and connected to the low pulley. Step back two to three feet (half a meter to one meter) from the pulley and lift your left leg out to form a 45-degree angle to your body.

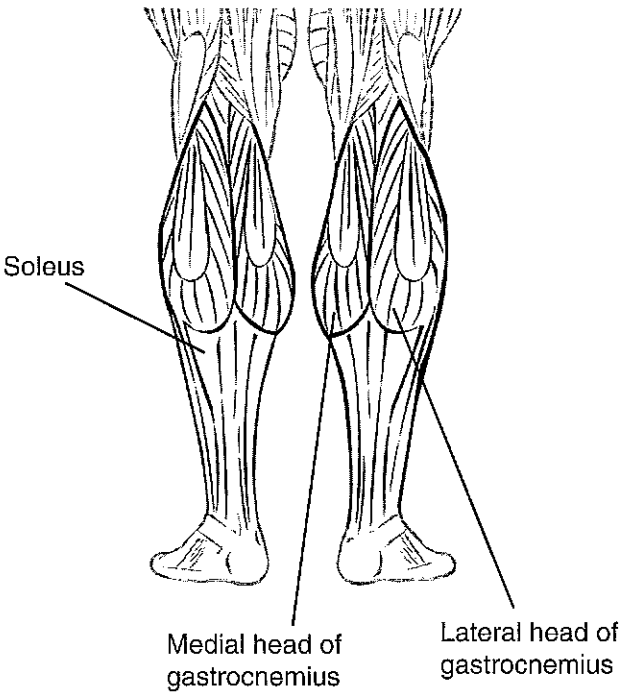
MOVE

Slowly flex your knee to curl your lower leg down to form a 90-degree angle at your knee. Hold this position for a second and then return your foot to the start. Complete the desired number of reps and repeat with the right leg.

CHAPTER 20

Calves

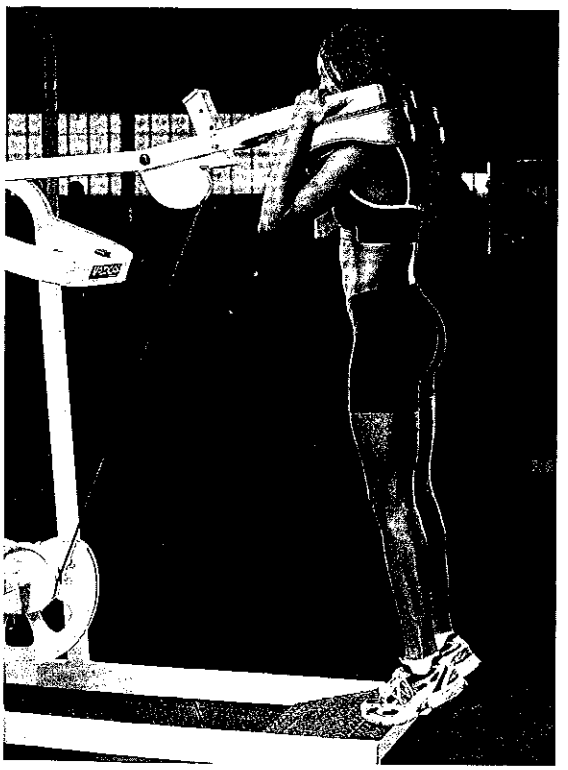
This chapter contains detailed descriptions of all major exercises that focus on the calf muscles, including the gastrocnemius and soleus muscles. The gastrocnemius has a medial head and a lateral head. The soleus lies beneath the gastrocnemius. See the diagram below for the location of these muscles. The calf exercises are divided into exercises that focus on the gastrocnemius and exercises that target the soleus. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Gastrocnemius Exercises

Soleus Exercises

Standing Calf Raise



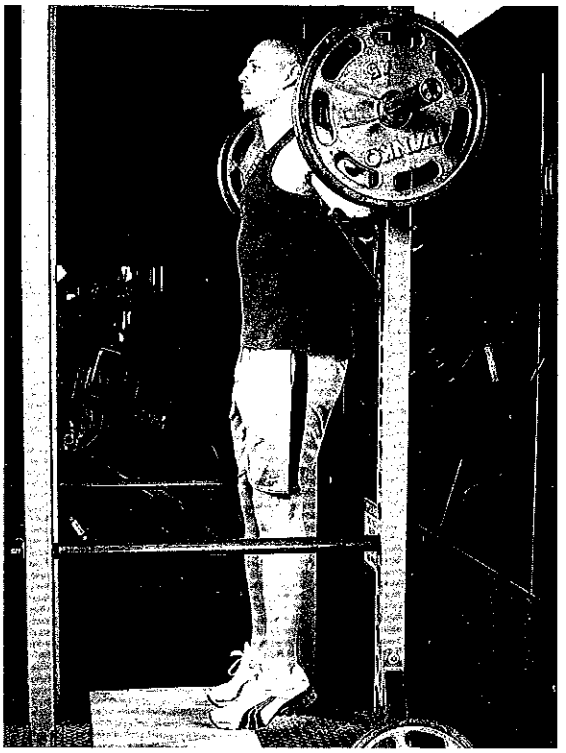
START

Stand beneath the shoulder pads of a standing calf raise machine with the balls of your feet at the edge of the foot rest. Keep your legs straight and your heels down to stretch the calves.

MOVE

Lift your heels by contracting the calf muscles to rise as high as you can on the balls of your feet. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

Power Rack Standing Calf Raise



START

Stand on a block set underneath a barbell set in a power rack. The barbell should be set at a height lower than your shoulders. Rest the bar on your shoulders and traps and hold it with a shoulder-width, overhand grip.

MOVE

Lift your heels by contracting the calf muscles to rise as high as you can on the balls of your feet, raising the bar up along the sides of the power rack. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

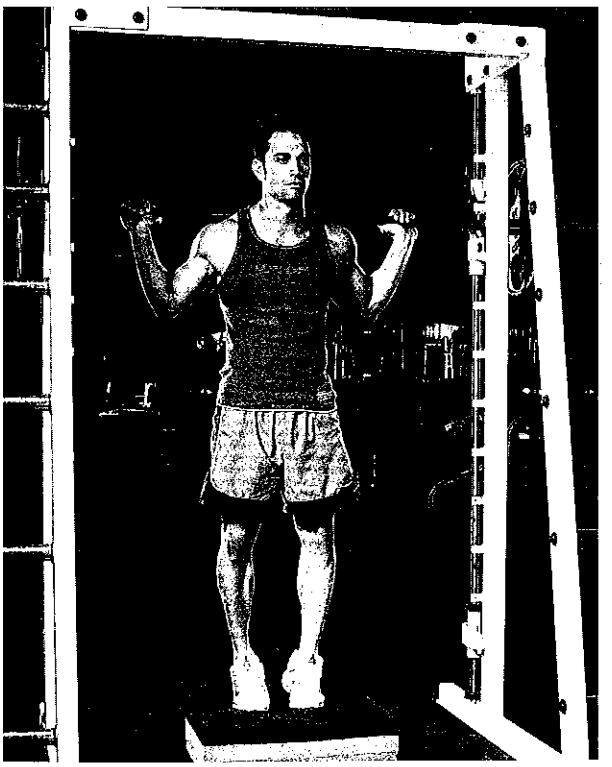
Smith Machine Standing Calf Raise

START

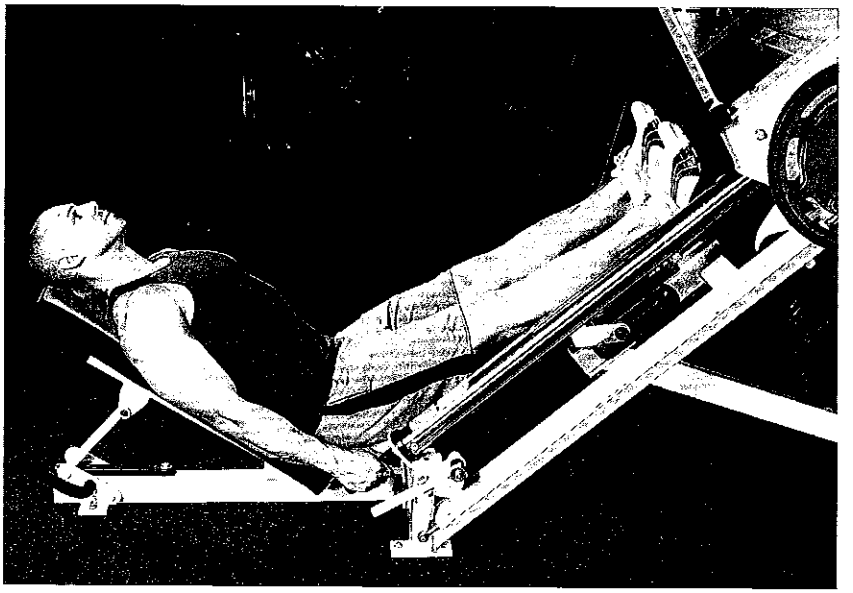
Stand on a block set underneath the bar of a Smith machine. Rest the bar on your shoulders and traps. Hold it with a shoulder-width, overhand grip and unlatch the safety hooks.

MOVE

Lift your heels by contracting the calf muscles to rise as high as you can on the balls of your feet, raising the bar up along the guides of the Smith machine. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.



Leg Press Calf Raise



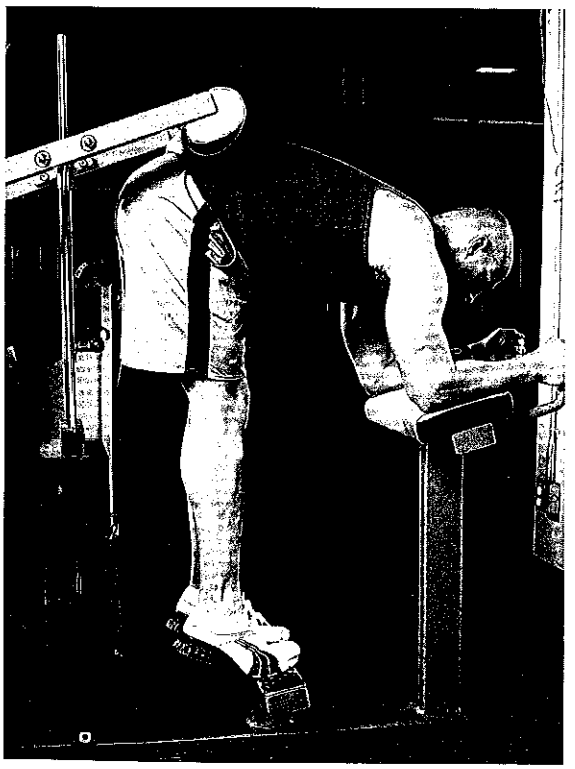
START

Sit in a leg press machine and place your feet on the bottom of the foot plate so that your heels hang off the foot plate. Press the foot plate up from the safety hooks (but do not unlatch them) by straightening your legs. Drop your toes down toward your shins to stretch your calves.

MOVE

Press the weight up with your toes by contracting your calf muscles. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

Donkey Calf Raise



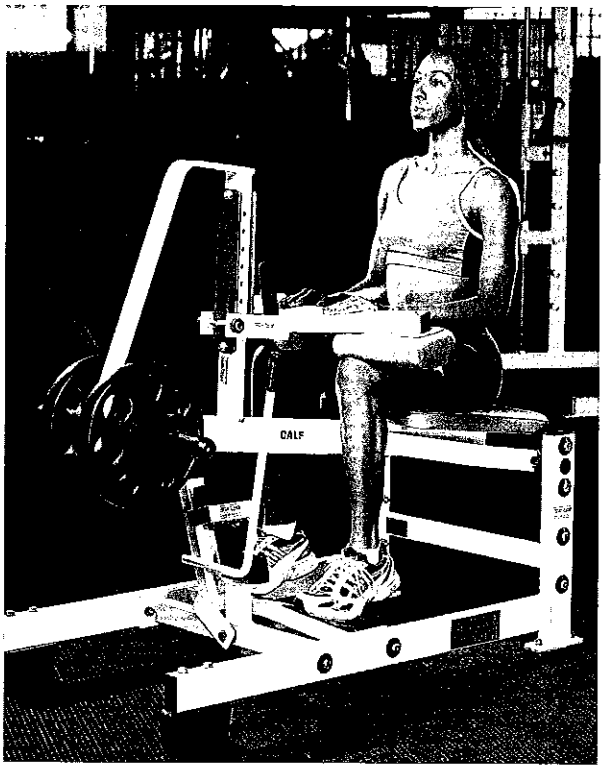
START

Position yourself in a donkey calf raise machine so that your feet are on the foot plate. Your torso is bent at the hips and parallel to the ground. Your forearms rest on the forearm pad and your low back supports the back pad. Drop your heels as low as you can to get a good stretch in your calves.

MOVE

Lift your heels by contracting the calf muscles to rise as high as you can on the balls of your feet, raising the weight up by the pad placed on the low back. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

Seated Calf Raise



START

Sit in the seated calf machine and place the balls of your feet on the foot plate so that your heels hang off the edge. Place the knee pad on your knees and unrack the weight. Drop your heels as low as you can to get a good stretch in your calves.

MOVE

Lift your heels by contracting the calf muscles to raise the weight as high as you can on the balls of your feet. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

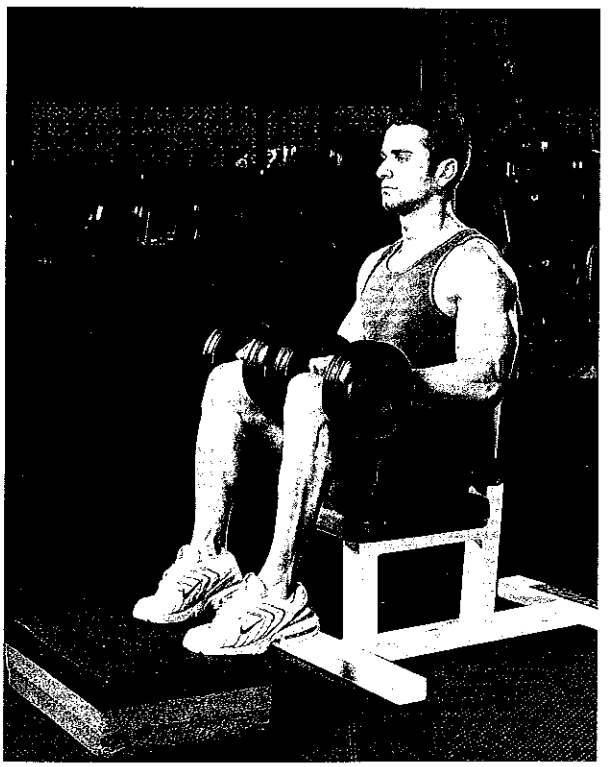
Dumbbell Seated Calf Raise

START

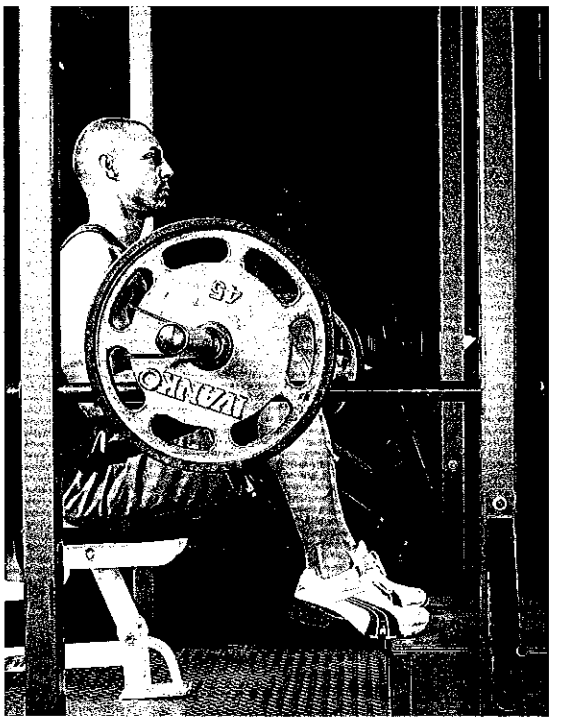
Sit on the end of a flat bench with your legs hip-width apart and your feet on a block or foot plate set on the floor. Place a dumbbell on the top of each knee and secure them there with your hands. Drop your heels as low as you can to get a good stretch in your calves.

MOVE

Lift your heels by contracting the calf muscles to raise the weight as high as you can on the balls of your feet. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.



Power Rack Seated Calf Raise



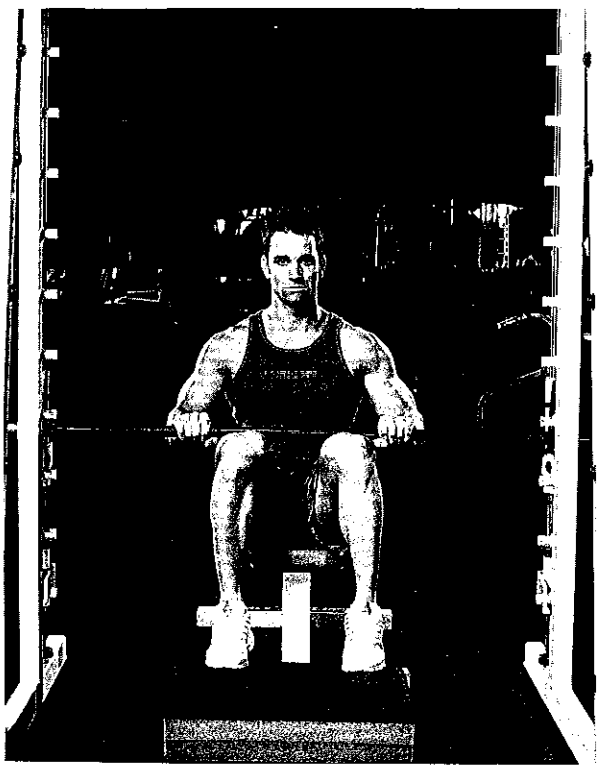
START

Place a flat bench in a power rack and set a block or foot plate (or if you have neither, try 25-pound plates) about one foot in front of the bench. Set the safety pins so that when the bar rests on them, it is at the same height as your knees or slightly lower when you sit on the bench. Sit on the bench with the bar resting on your thighs (about four inches up from your knee caps). The balls of your feet are on the plates and your heels are on the floor.

MOVE

Lift your heels by contracting the calf muscles to raise the weight as high as you can on the balls of your feet. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

Smith Machine Seated Calf Raise



START

Place a flat bench in a Smith machine and set a block or foot plate (or if you have neither, try 25-pound plates) about one foot in front of the bench. Sit on the bench with the unlatched bar resting on your thighs (about four inches up from your knee caps). The balls of your feet are on the plates and your heels are on the floor.

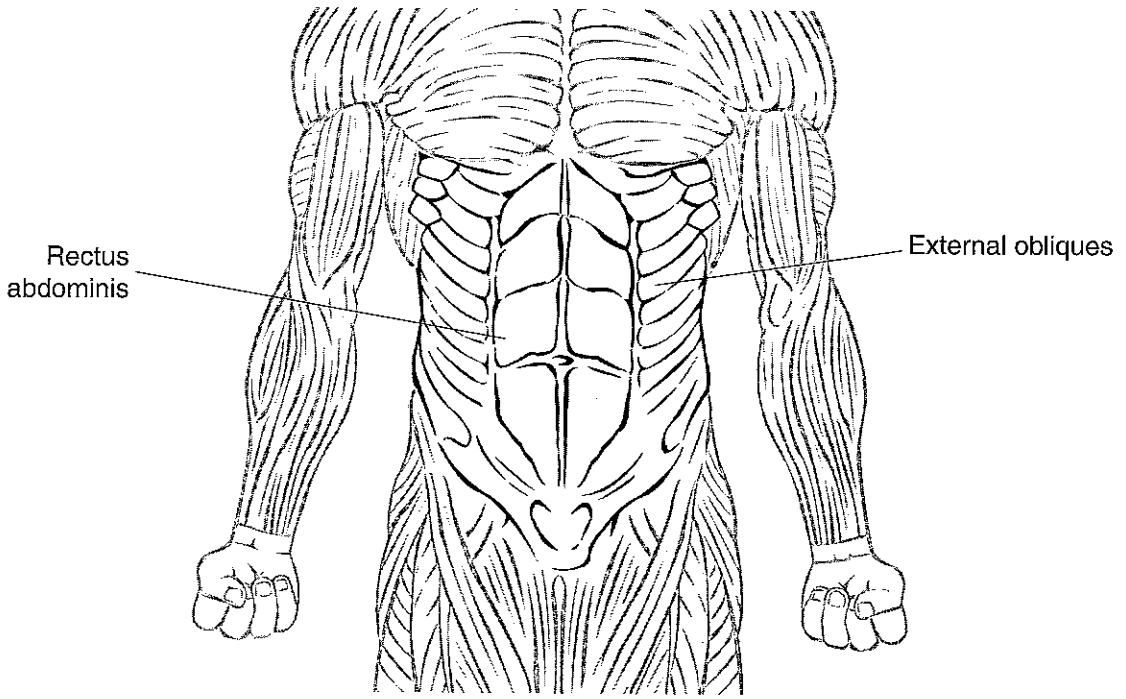
MOVE

Lift your heels by contracting the calf muscles to raise the weight as high as you can on the balls of your feet. Hold this position for a second, flexing your calf muscles, then lower your heels back to the starting position.

CHAPTER 21

Abdominals

This chapter contains detailed descriptions of all major exercises that focus on the abdominal muscles, including the rectus abdominis, external obliques, internal obliques, and transverse abdominis. See the diagram below for the location of the rectus abdominis and external obliques. The internal obliques and transverse abdominus cannot be seen in this diagram because they lie beneath the rectus abdominis and external obliques. The abdominal exercises are divided into upper-abdominal exercises, lower-abdominal exercises, oblique exercises, and core exercise. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



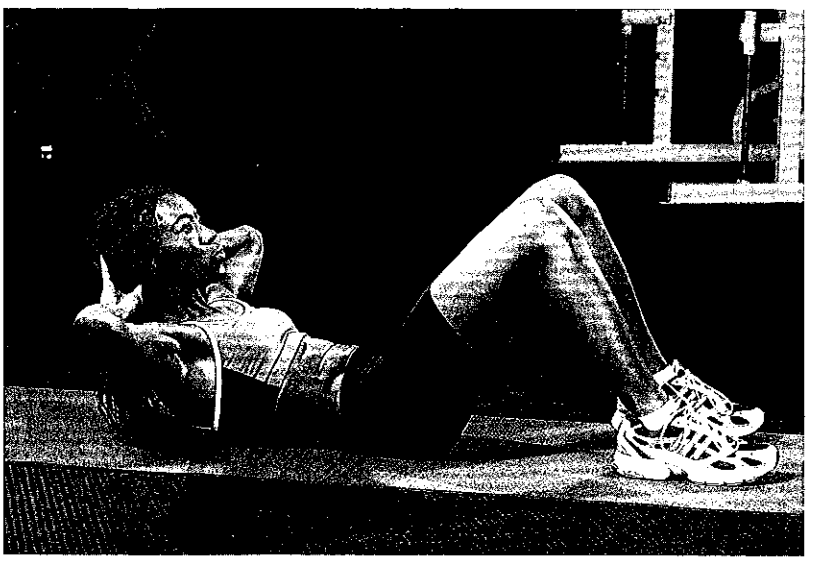
Upper-Abdominal Exercises

Lower-Abdominal Exercises

Oblique exercises

Core Exercises

Crunch



START

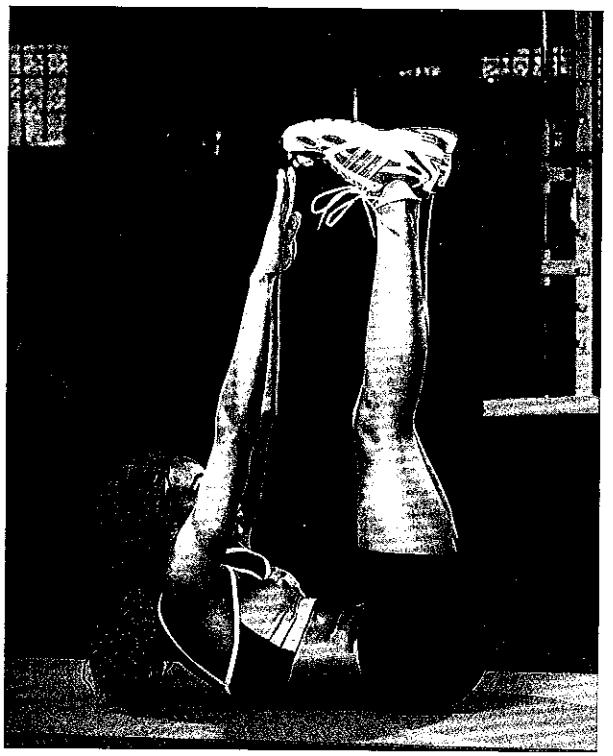
Lie on the floor with your knees bent. Feet and low back are flat on the floor.

MOVE

With your hands cupped loosely behind your head, contract through your abs to lift your shoulders and upper back off the floor. Hold this position for a second before slowly lowering back to the starting position, making the negative portion of the rep as slow and deliberate as the positive portion.

Note: To make this exercise more difficult, hold a weight plate on your chest.

Straight-Leg Crunch



START

Lie faceup on the floor with your legs straight up in the air.

MOVE

Curl up as high as you can to bring your shoulders and upper back off the floor. Hold this position for a second before slowly lowering back to the starting position.

Note: To make this exercise more difficult, hold a weight plate on your chest.

Decline Crunch

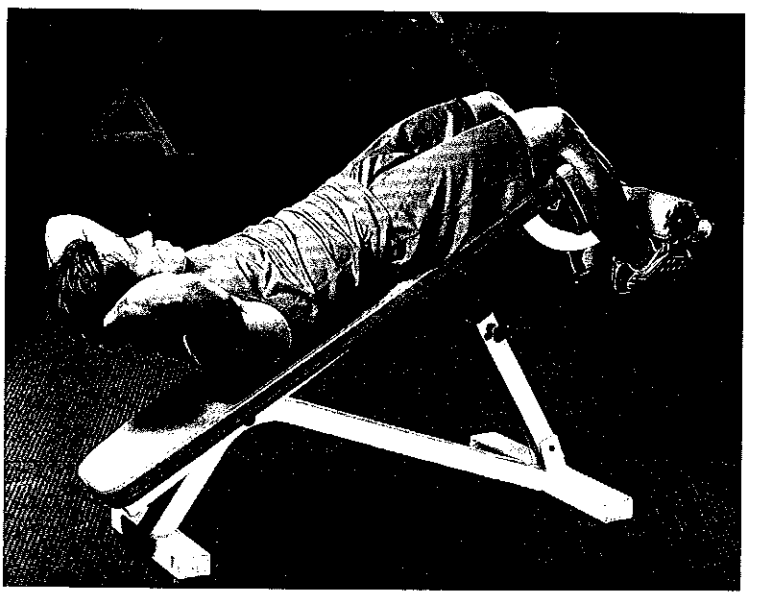
START

Lie back in a decline bench with your feet secured under the foot pad. Cup your hands behind your head.

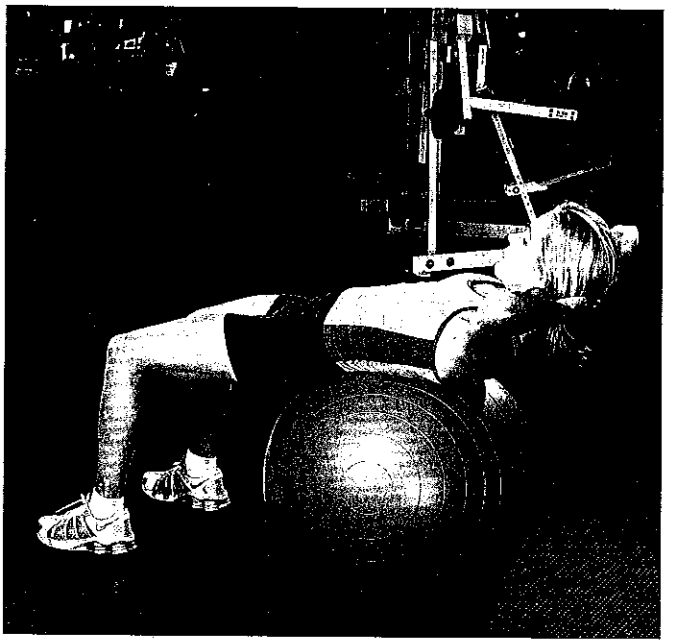
MOVE

Curl up as high as you can to bring your shoulders and upper back off the bench, simultaneously pressing your lower back into the bench. Hold this position for a second before slowly lowering back to the starting position.

Note: To make this exercise more difficult, hold a weight plate on your chest.



Exercise-Ball Crunch



START

Lie on your back on a stability ball with your feet flat on the floor.

MOVE

Curl up as high as you can to bring your shoulders and upper back off the ball. Hold this position for a second before slowly lowering back to the starting position.

Note: To make this exercise more difficult, hold a weight plate on your chest.

Exercise-Ball Crunch With Medicine-Ball Throw

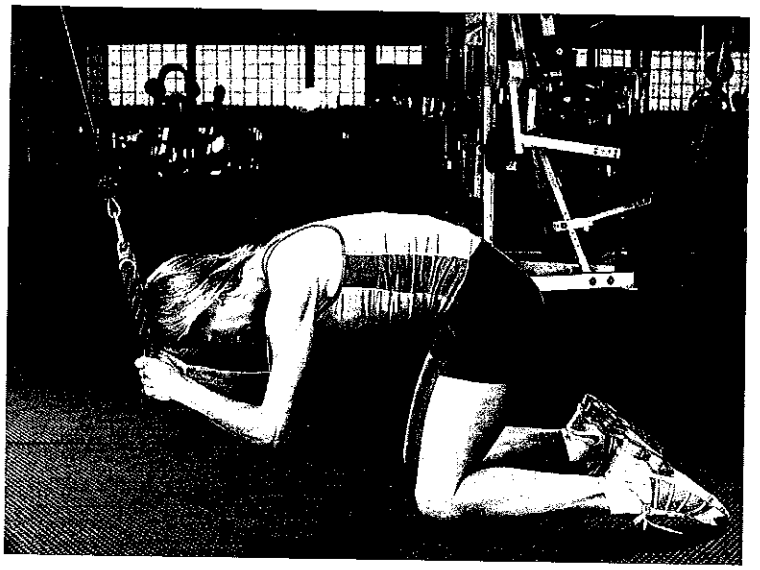
START

Lie on your back on a stability ball with your feet flat on the floor. Hold a medicine ball with your arms extended back over your head.

MOVE

Curl up explosively to bring your shoulders and upper back as high as possible off the ball while throwing the medicine ball to a training partner. Hold the top position. Your partner then throws the ball back to you. Use your abs to resist the direction of the ball and return to the starting position.

Cable Crunch



START

Kneel facing a high-pulley cable with a rope attached to it. Grasp the ends of the rope and bring your hands down to the top of your head, where they remain fixed throughout the movement. Bend over at the waist so that your back is almost parallel with the floor.

MOVE

Curl your torso down to bring your elbows toward your knees. Hold this position and flex your abs for a second before slowly going back to the starting position.

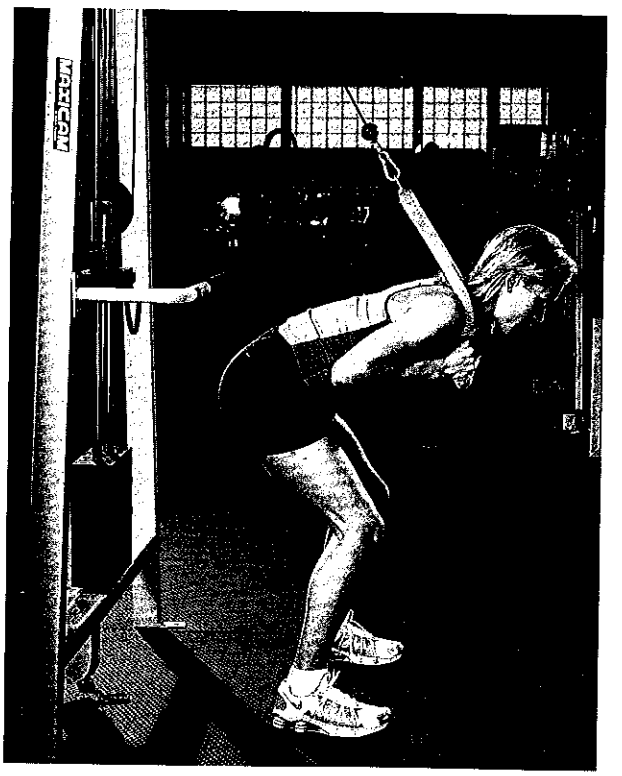
Standing Cable Crunch

START

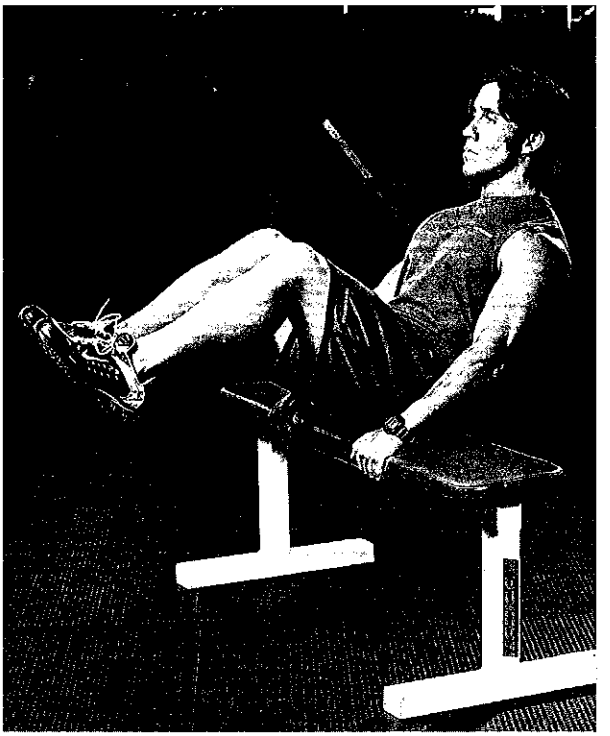
Stand with your back toward a high-pulley cable with a rope attached to it. Grasp the end of the rope with a neutral grip and bring your hands down to your collarbone. Your feet are shoulder-width apart and your knees are slightly bent.

MOVE

Curl your torso down to bring your elbows toward your knees. Hold this position and flex your abs for a second before slowly going back to the starting position.



V-Up



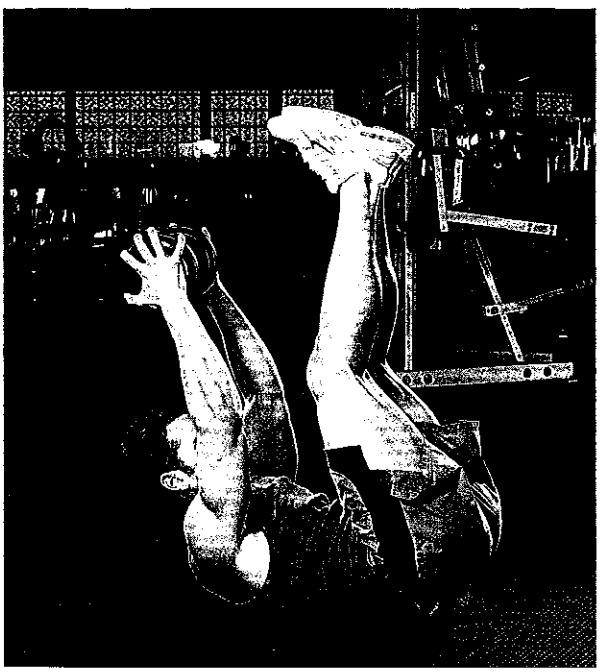
START

Sit crossways in the middle of a flat bench with your hands grasping the edges and your feet off the floor. Lean back until your body is almost straight and parallel to the floor.

MOVE

Start with your legs straight, then bring your knees toward your chest while simultaneously curling your upper body toward your knees to form a V at the waist. Return your legs and torso to the starting position.

Dumbbell V-Sit



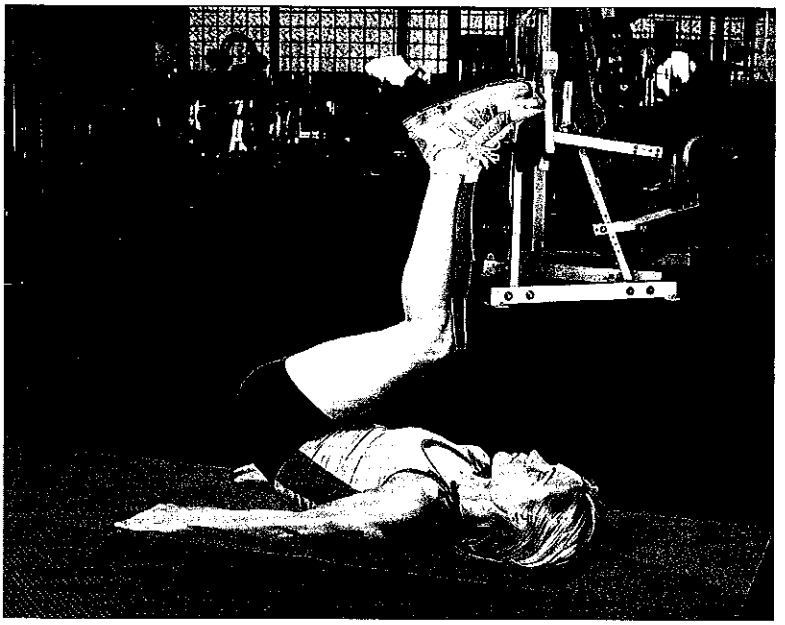
START

Lie faceup on the floor. Arms are fully extended overhead and resting on the floor. Hold a dumbbell with both hands.

MOVE

Contract your abs to flex your spine, slowly drawing your legs and shoulders off the floor. Crunch hard until your feet and hands point at the ceiling and your body is in a V position. Slowly lower back to the starting position.

Reverse Crunch



START

Lie faceup on the floor with your hands extended at your sides. Feet are up and thighs are perpendicular to the floor (your hips and knees should form a 90-degree angle).

MOVE

Slowly bring your knees toward your chest, lifting your hips and glutes off the floor. Try to maintain the bend in your knees throughout the movement. Return to the starting position under control.

Note: To make this exercise more difficult, perform it on a decline bench with your head on the high end.

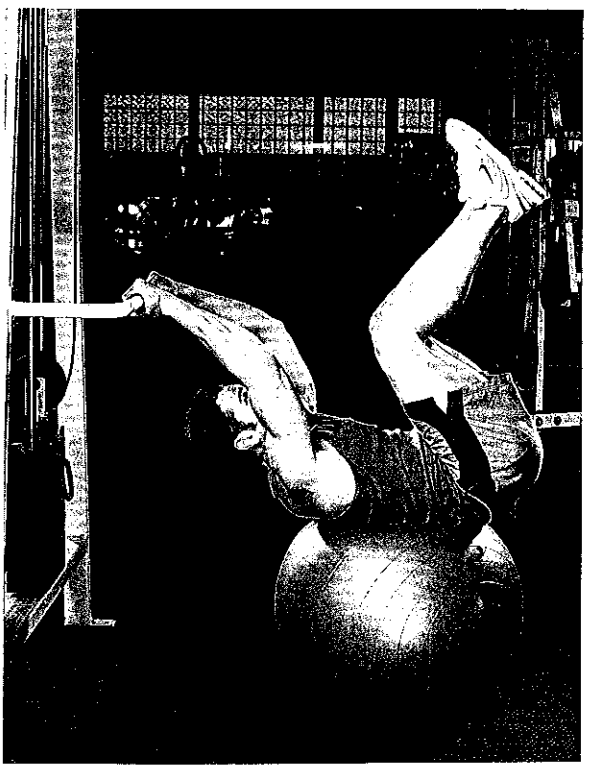
Exercise-Ball Reverse Crunch

START

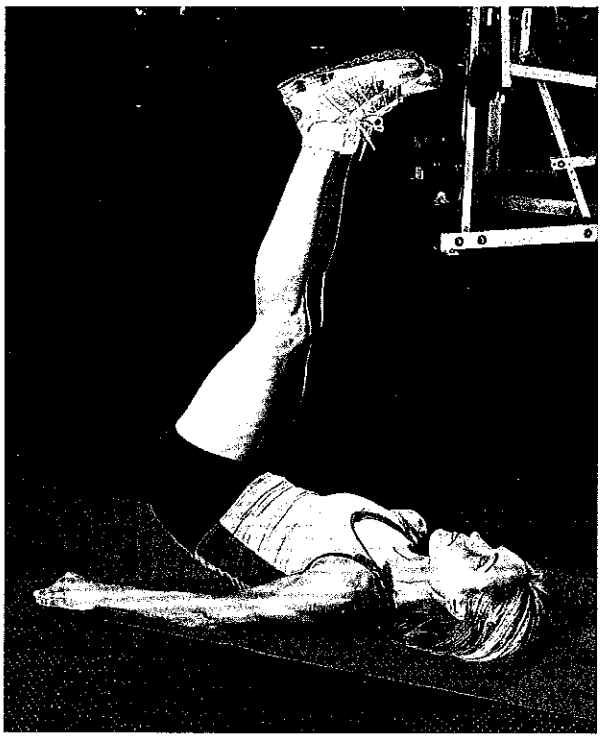
Place an exercise ball next to an exercise machine or other apparatus that you can grab for stability. Lie on your back on the stability ball with your feet up and thighs perpendicular to the floor (your hips and knees should form a 90-degree angle). Reach back over your head and grab on to the apparatus for stability.

MOVE

Slowly bring your knees toward your chest, lifting your hips and glutes off the ball. Try to maintain the bend in your knees throughout the movement. Return to the starting position under control.



Hip Thrust



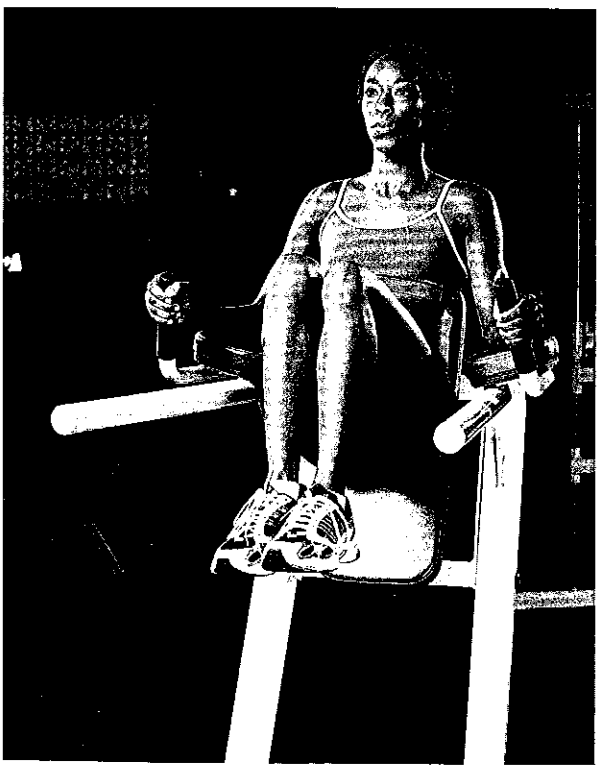
START

Lie faceup on the floor with your hands extended at your sides. Your legs are perpendicular to the floor.

MOVE

Raise your hips and glutes straight up off the floor by using your abdominals. Hold for a second in this position, then lower your hips back to the starting position.

Hanging Knee Raise



START

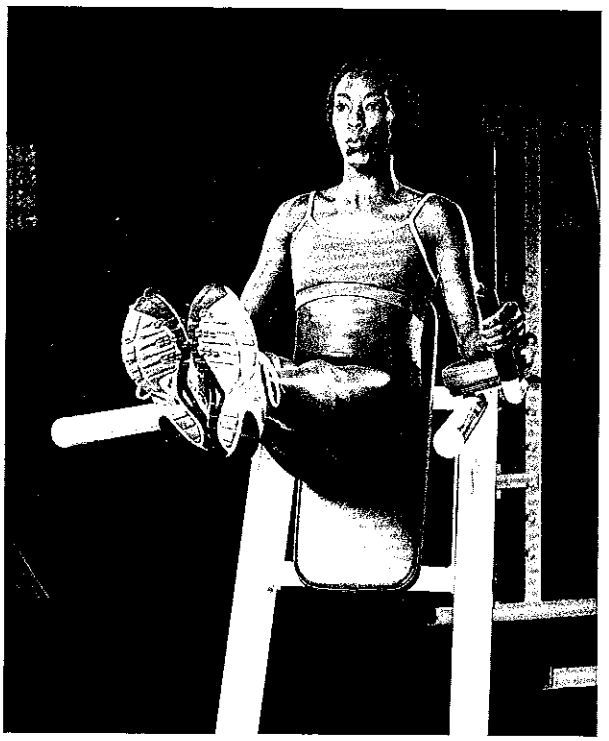
Position yourself on a vertical bench and hang from it with your torso straight and your knees slightly bent.

MOVE

Lift your legs, bending your knees on the way up to pull your knees up toward your chest while rounding your lower back to bring your glutes forward and up. Pause in this position for a second, then slowly lower your legs to the starting position.

Note: This exercise can also be done hanging from a chin-up bar.

Hanging Leg Raise



START

Position yourself on a vertical bench with your entire body completely straight.

MOVE

Keeping your legs straight, lift your legs up as high past parallel with the floor as possible by flexing at the waist while rounding your lower back to bring your glutes forward and up. Pause in this position for a second, then slowly lower your legs to the starting position.

Note: This exercise can also be done hanging from a chin-up bar.

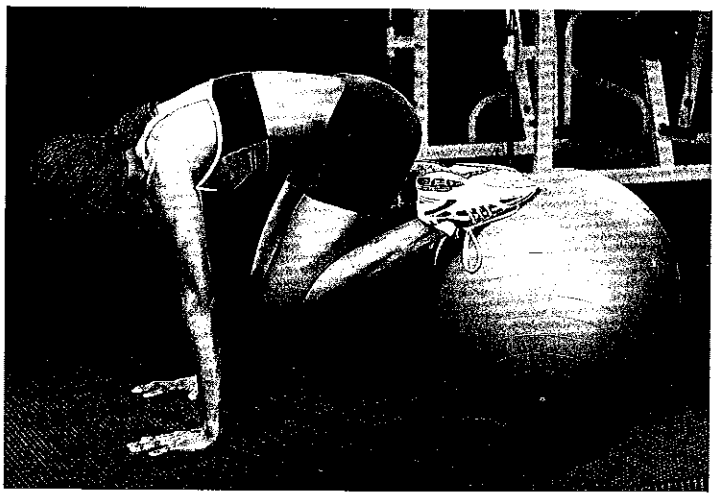
Exercise-Ball Tuck

START

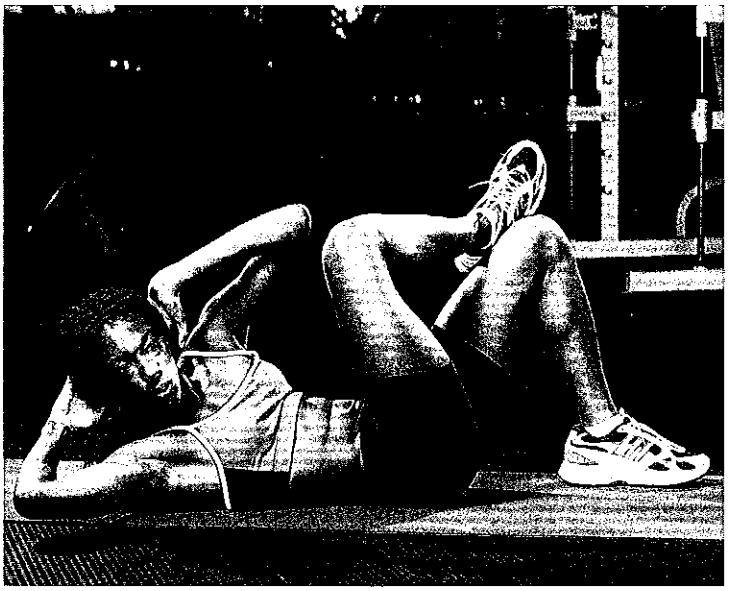
Lie on the floor in a push-up position with your feet resting on top of an exercise ball.

MOVE

Tuck your knees in toward your chest while rolling the ball forward. Hold the tucked position for a second, and then return to the starting position by extending your legs back.



Crossover Crunch



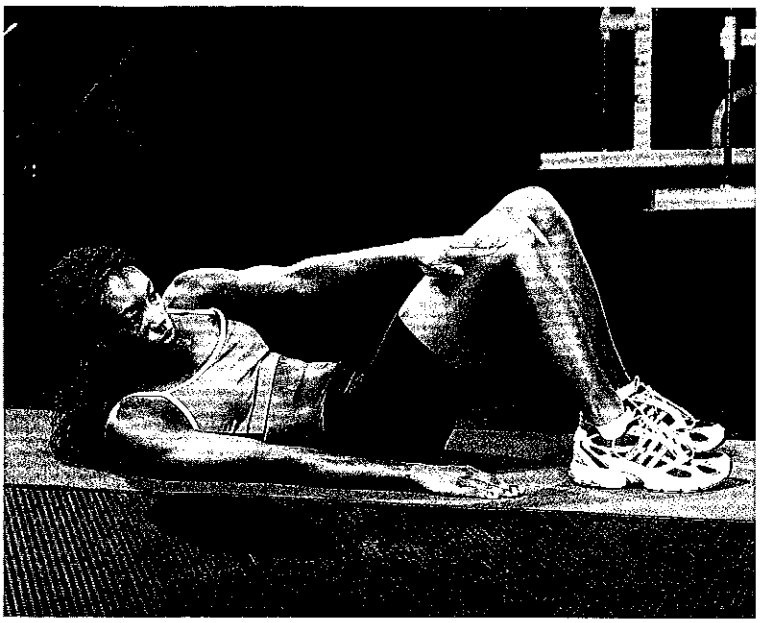
START

Lie faceup on the floor with your knees bent about 60 degrees and feet flat on the floor. Cross your right ankle over your left knee. Cup your hands behind your head.

MOVE

Curl up as high as you can, bringing your left shoulder and upper back off the floor. Simultaneously bring your left elbow across your body toward your right knee. Hold at the top for a second, then slowly lower yourself back to the starting position. Do all the reps for the left side and then repeat on the right.

Reaching Crossover Crunch



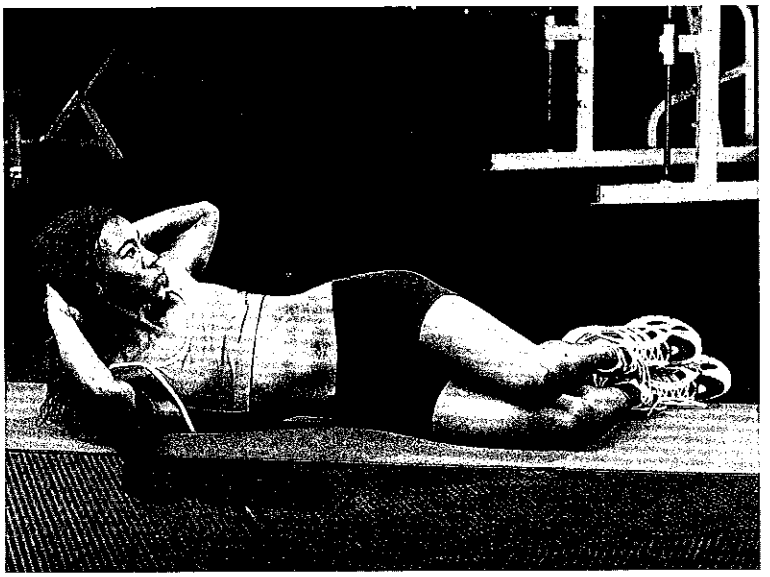
START

Lie on your back, knees bent about 60 degrees and feet flat on the floor. Hold your arms extended a few inches off the floor alongside your hips.

MOVE

Raise your left shoulder and upper back off the floor as you reach with your left arm across your torso to your right knee. Return to the start and repeat on the right side.

Oblique Crunch



START

Lie on your back, knees bent about 60 degrees and feet flat on the floor. Drop your knees to the right side so that the outside of your right leg is flat on the floor. Your knees are still bent and your left leg is on top of the right. Cup your hands behind your head.

MOVE

Curl up as high as you can to bring your shoulders and upper back off the floor. Hold this position for a second before slowly lowering back to the starting position. Complete the desired number of reps and then repeat on the other side.

Note: To make this exercise more difficult, hold a weight plate on your chest.

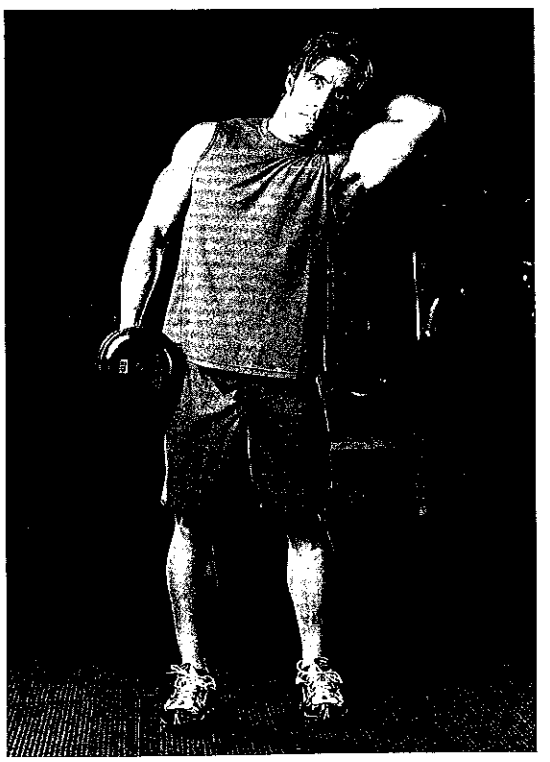
Standing Dumbbell Oblique Crunch

START

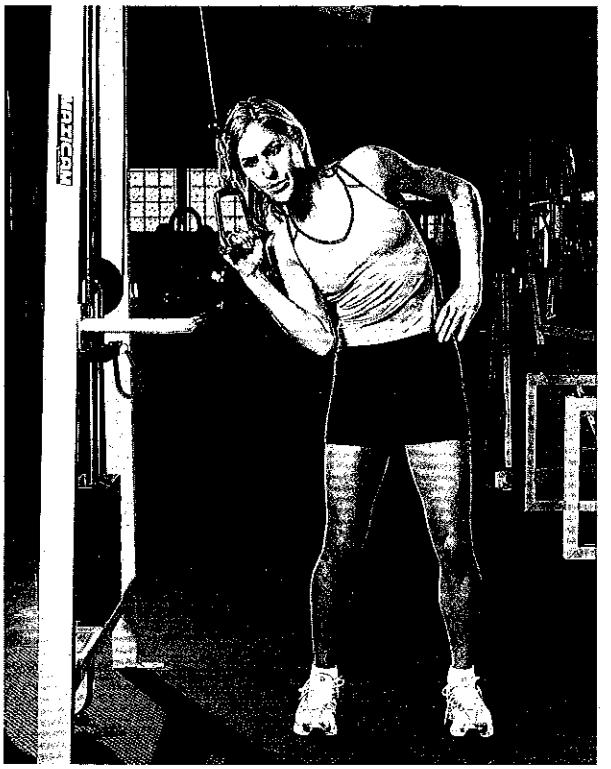
Stand with your feet shoulder-width apart while holding a dumbbell with a neutral grip in your right hand with your arm hanging at your side.

MOVE

Bend sideways at the waist to the left as low as possible using your oblique muscles to pull your torso down. Hold for a second and return to the starting position. Complete the desired number of reps and repeat on the right side.



Standing Cable Oblique Crunch



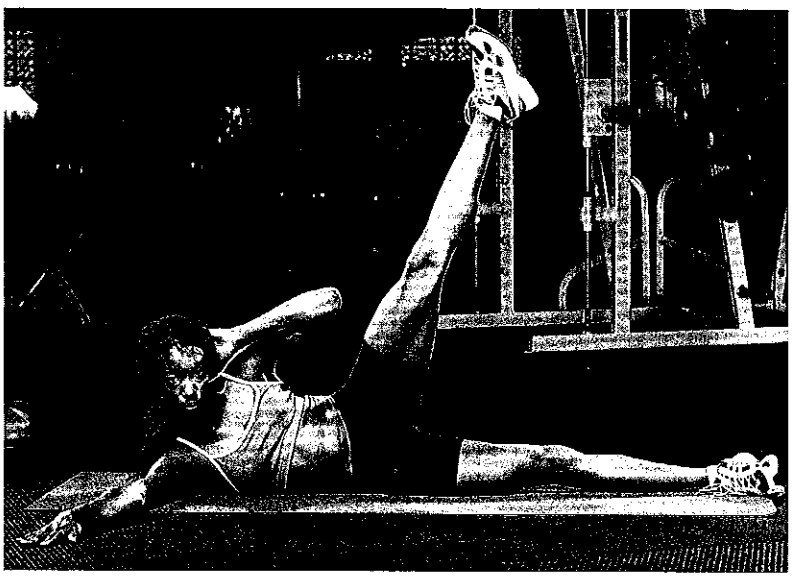
START

Stand with your right side toward a high-pulley cable with a single-handle D-grip attached to the pulley. Grip the handle with your right hand, palm up, and bring it toward your temple while keeping your elbow tucked tightly at your side.

MOVE

Contract though your obliques, pulling your torso down to the right. Pause a moment in this position before slowly returning to the starting position. Complete the desired number of reps and repeat on the left side.

Side Jackknife



START

Lie on the floor on your right side, keeping your left leg over your right one. Both legs are straight. Place your right hand in a comfortable position and cup your left hand behind your head.

MOVE

As you pull with your obliques, bring your torso and left leg toward each other. Hold the contraction briefly and lower slowly to the starting position. Complete the desired number of reps and repeat on the other side.

Russian Twist

START

Lie faceup on the floor with your head about a foot (30.5 centimeters) from a stable object such as an exercise machine. Extend your arms overhead to grab the apparatus for stabilizing your torso. Lift your legs straight up so that they are perpendicular to the floor.

MOVE

Slowly lower your legs to the floor on your right side. Reverse the movement to bring them back up above you and then lower them to the left side.

Note: To make this exercise more difficult, add resistance by holding a medicine ball between your knees.

Standing Medicine-Ball Rotation

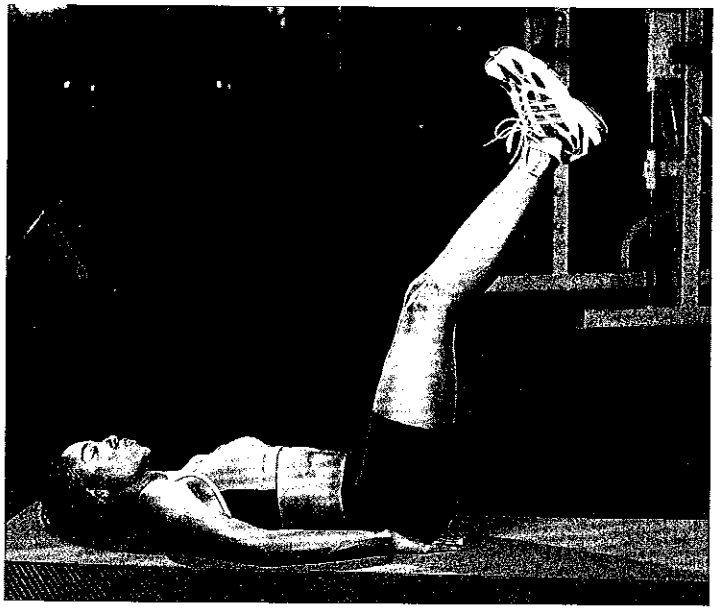
START

Stand straight with knees slightly bent. Hold a medicine ball with both hands at shoulder level. Your training partner assumes the same position behind you but without a medicine ball.

MOVE

Keeping your lower body in place, rotate your torso to one side and pass the ball high to your partner, who has simultaneously rotated in that same direction. Then rotate in the other direction and receive the ball back from your partner, this time in a lower position (hands at your waist rather than at shoulder level). Continue passing and receiving the ball in this fashion for the desired number of reps. Then do the same number of reps beginning with the ball high on the other side.

Lying Leg Raise



START

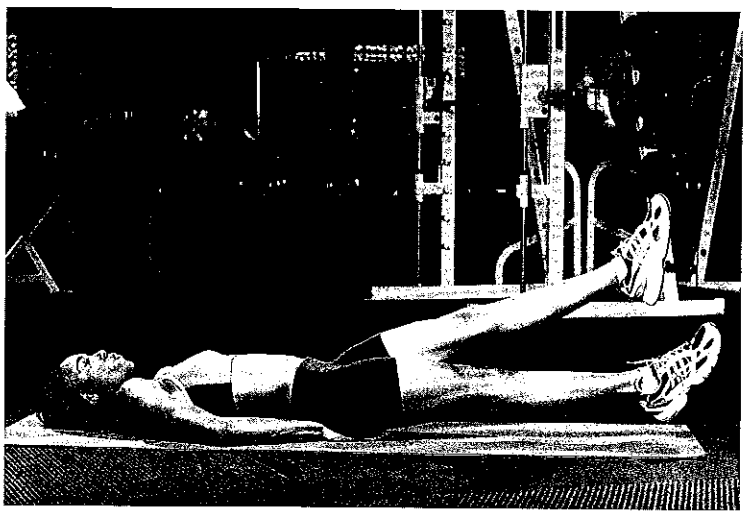
Lie faceup on the floor with your entire body straight and your hands under your glutes to stabilize your torso. Hold your legs a few inches off the floor.

MOVE

Raise your legs up toward the ceiling until they are just short of perpendicular to the floor. Slowly lower your legs back to the starting position.

Note: To make this exercise more difficult, perform it on a decline bench with your head on the higher end.

Scissor Kick



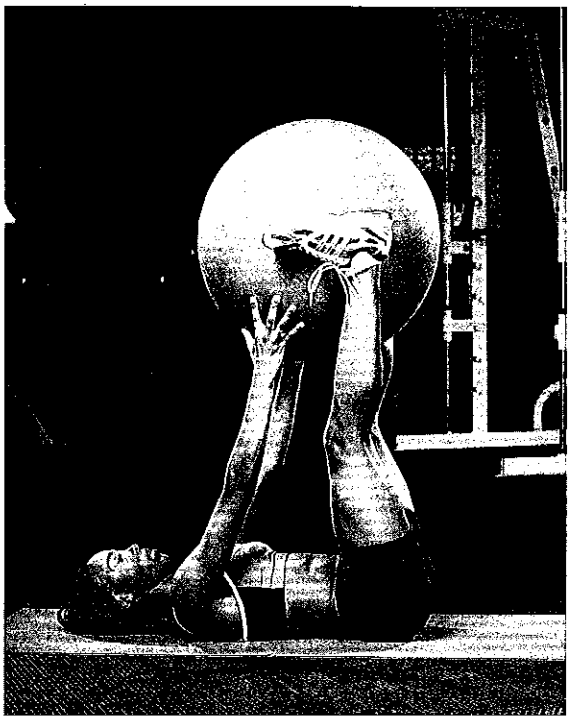
START

Lie faceup on the floor with your entire body straight and your hands under your glutes to stabilize your torso. Hold your legs a few inches off the floor.

MOVE

Make small, rapid, alternating up-and-down scissorlike motions as you lift each leg about 45 degrees into the air and lower each until your heel is a few inches off the floor.

Exercise-Ball Pass



START

Lie on your back with your legs and arms extended. Hold an exercise ball in your hands.

MOVE

Raise the ball overhead with your arms while simultaneously bringing your legs toward it. When your hands and feet meet, pass the ball from your hands to your feet. Without pausing, lower your arms and legs back down. Continue in alternating fashion.

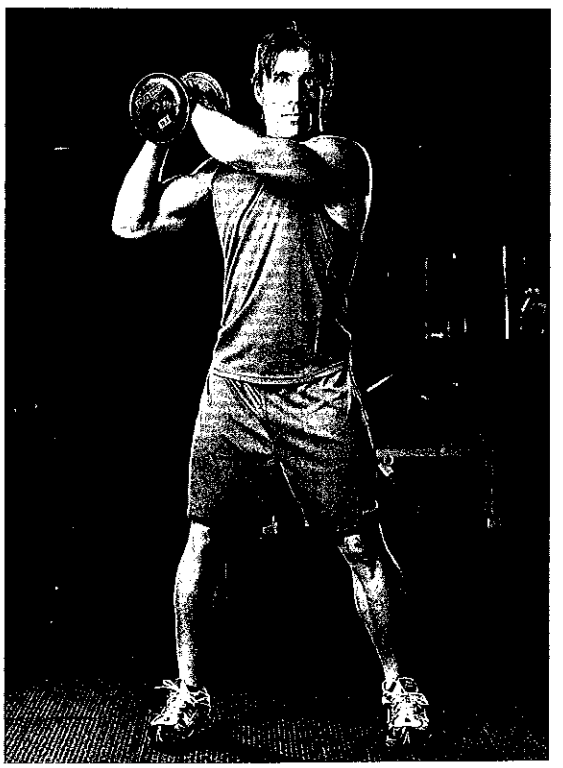
Dumbbell Woodchopper

START

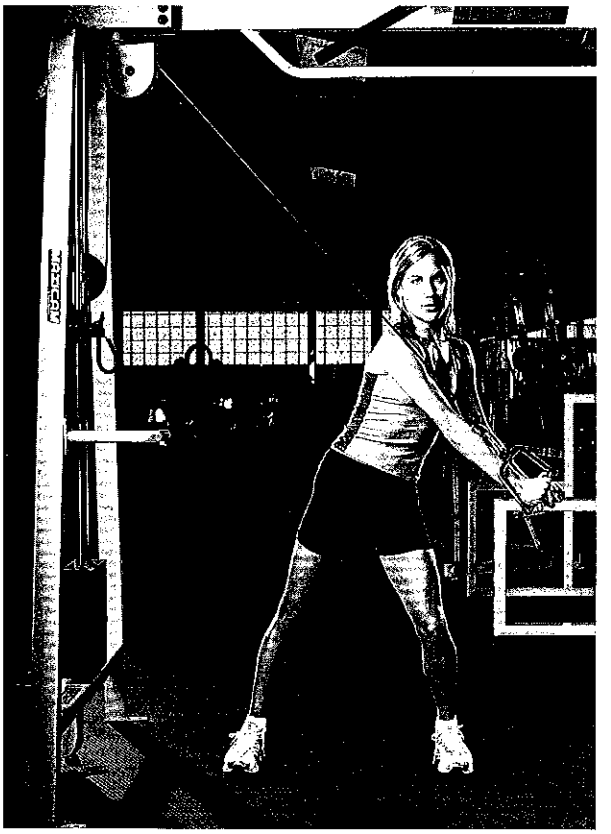
Stand with your feet about shoulder-width apart and knees slightly bent. Grasp a light dumbbell in both hands, holding it outside and above your right shoulder.

MOVE

Slowly lower the dumbbell diagonally across your body until it is beside your left hip. Reverse the direction, returning to the starting position. Complete the desired number of reps, then repeat on the left side.



Cable Woodchopper



START

Stand with your right side toward a high-pulley cable with a single-handle D-grip attached to it. Grab the handle with both hands and hold it outside your right shoulder in a similar manner to the start of the dumbbell woodchopper exercise.

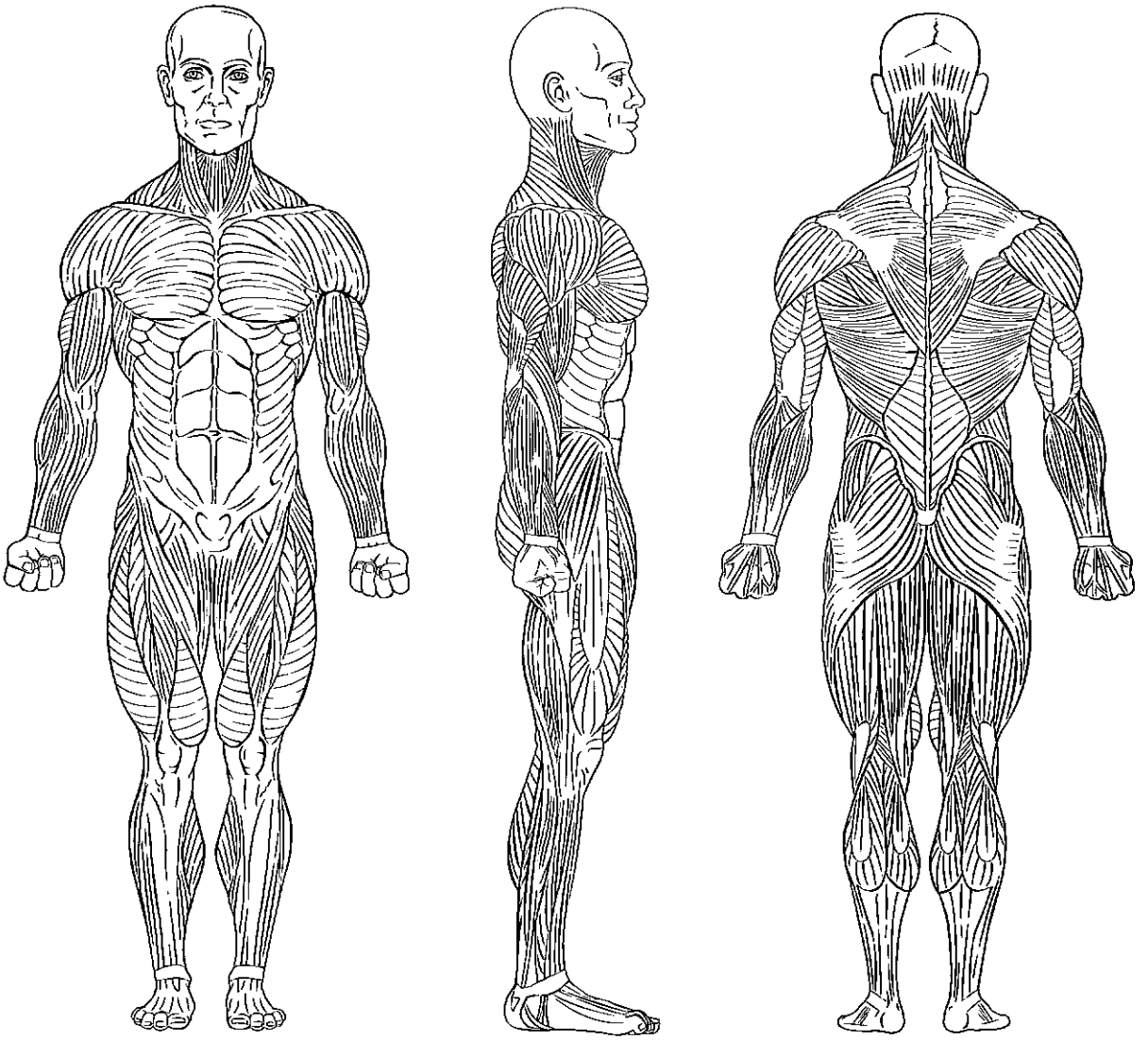
MOVE

Pull the handle across the front of your body to your left hip. Slowly resist the handle back to the starting position. Complete the desired number of reps and repeat on the left side.

CHAPTER 22

Whole Body

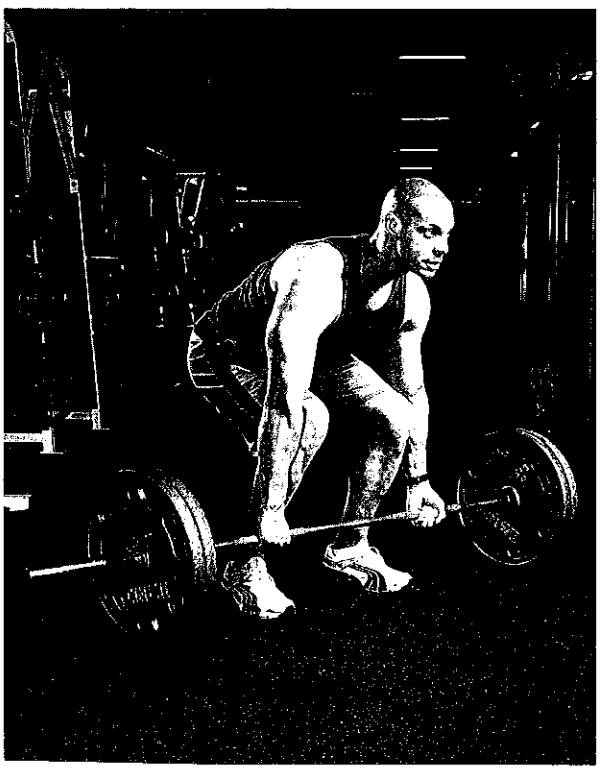
This chapter contains detailed descriptions of the exercises that involve multiple joints and use multiple large muscle groups of the upper and lower body. These exercises are divided into barbell whole-body exercises and dumbbell whole-body exercises. Wherever a certain type of exercise is used in a workout, any one of the same type can be substituted.



Barbell Whole-Body Exercises

Dumbbell Whole-Body Exercises

Deadlift



START

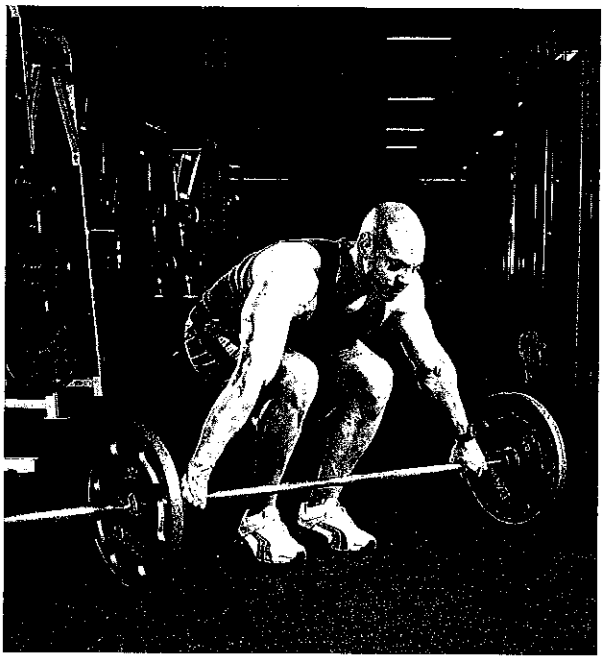
Stand over a loaded barbell resting on the floor. Your shins should touch the bar. Squat down to grab the bar using a staggered grip. Both your feet and your hands should be about shoulder-width apart. Your torso should be bent at 45 degrees over the bar and your arms should be tensed and pulling on the bar. Your thighs are slightly higher than parallel with the floor.

MOVE

Keep your abs pulled in tight and tense your entire body. Drive through your heels to straighten your knees and bring your hips forward until you are in a standing position. Once standing, bring your shoulders back slightly and pause. Lower the barbell along the same path (close to your body all the way down) to the floor. Touch the plates lightly to the floor and begin your next rep.

Note: For a detailed description on using the deadlift for maximal strength, see chapter 8.

Snatch



START

Stand over a barbell placed on the floor. Your legs are hip-width apart and your shins are about an inch (2.5 centimeters) from the bar. Squat down and grab the barbell with a very wide overhand grip. Your shoulders should be over the barbell and your back should be tightly arched.

MOVE

With one smooth motion, forcefully extend at the hips and knees as you swing the barbell forward and up with your arms. The extension at the hips and knees should be minimal—just enough to start the barbell moving from the floor. Immediately squat back down by flexing at the hips and knees as you extend the barbell straight overhead. With the barbell extended straight overhead, forcefully extend at the hips and knees to stand straight up. Return the barbell to the floor.

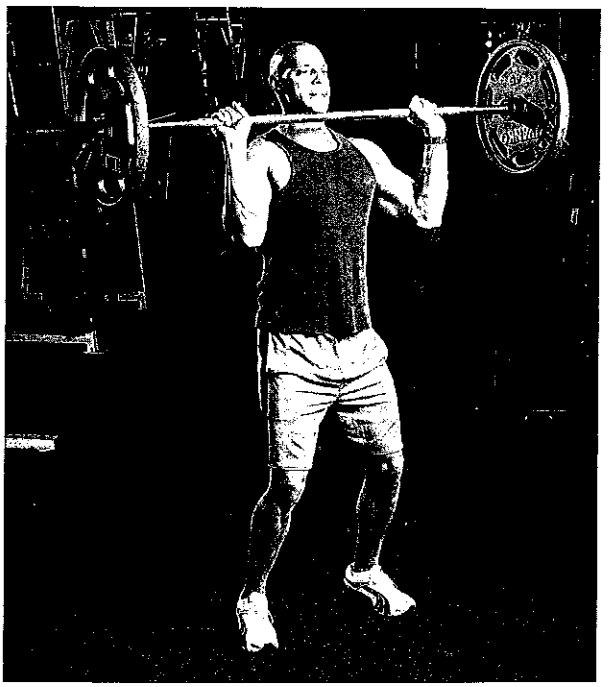
Clean and Jerk

START

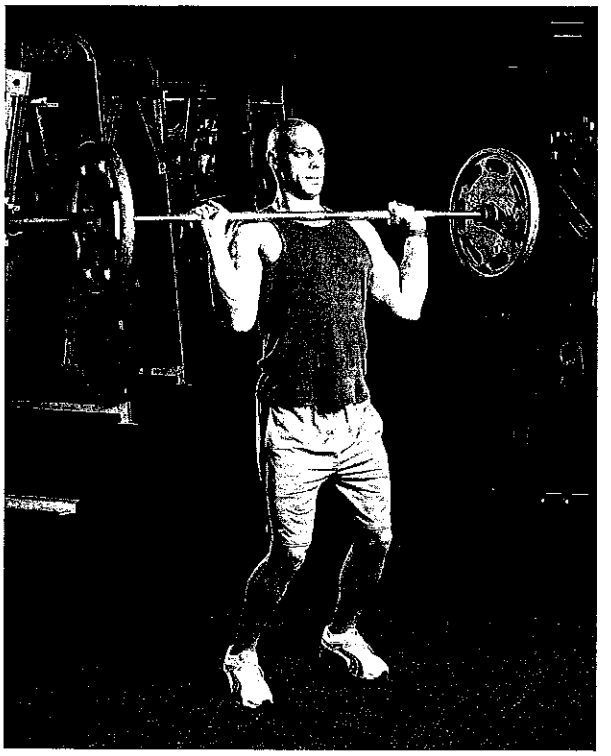
Squat down and grab a loaded barbell bar resting on the floor using a staggered grip. Both your feet and your hands should be about shoulder-width apart with your shins about an inch from the bar. Your torso should be bent at 45 degrees over the bar, and your arms should be tensed and pulling on the bar. Your thighs will be slightly higher than parallel with the floor.

MOVE

Keep your abs pulled in tight as you drive explosively through your heels to straighten your knees and hips to lift the bar to hip height. Immediately pull the bar up to shoulder height as you squat under it to catch it on your upper chest and shoulders. Extend at the hips and knees to stand straight up with a slight bend in the knees. Extend forcefully at the knees and hips as you press the bar straight overhead. You can perform the press with your feet stationary. Or you can split your legs to drive one foot forward and the other back, then bring your legs together while keeping your arms extended overhead. Return the bar back to the starting position.



Power Clean



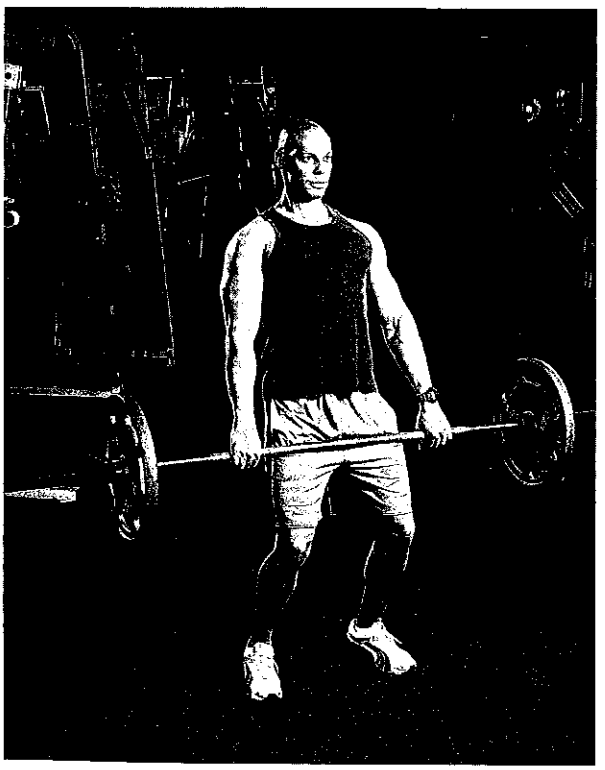
START

Stand over a loaded barbell resting on the floor. Your shins are about an inch (2.5 centimeters) from the bar. Squat down to grab the bar using a staggered grip. Both your feet and your hands should be spaced about shoulder-width apart. Your torso should be bent at 45 degrees over the bar with your arms tensed and pulling on the bar. Your thighs are slightly higher than parallel with the floor.

MOVE

Keep your abs pulled in tight and tense your entire body. Drive explosively through your heels to straighten your knees and bring your hips forward until the bar is at hip height. Pull the bar up to your shoulders and squat under the bar as you catch it on your shoulders and whip your arms around so that the elbows are pointing forward. Extend at the hips and knees so that you are standing straight up with a slight bend in the knees with the bar resting on your upper chest.

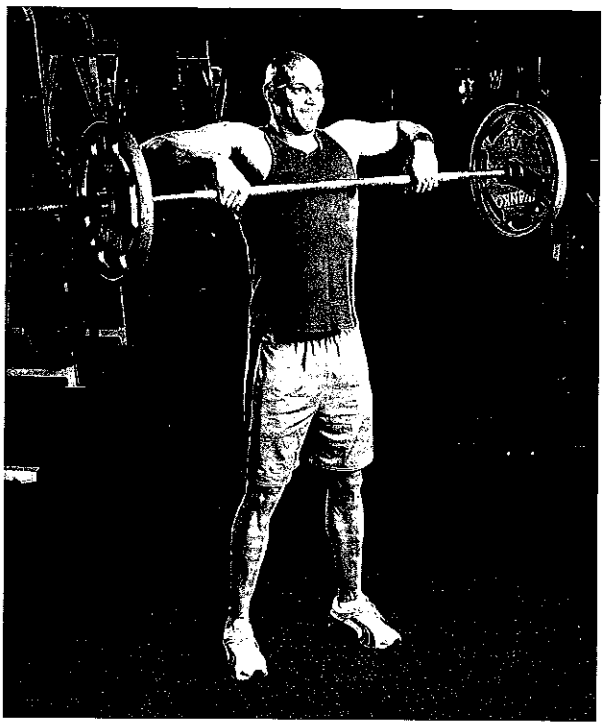
Hang Clean



MOVE

This exercise is performed similar to a power clean but the bar starts at mid-thigh.

High Pull



START

The first part of the movement is the same as for the clean and jerk.

MOVE

When the bar reaches thigh level, explosively move it upward by extending the hip, knee, and ankle joints in a jumping motion. When you reach full extension, shrug your shoulders. Then pull with your arms, bringing the bar as high as possible. Slowly lower the bar and reset.

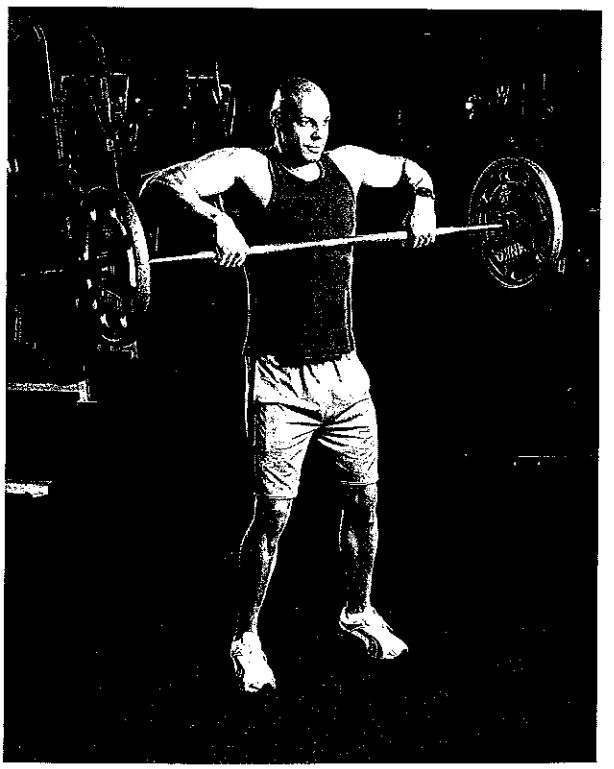
Hang Pull

START

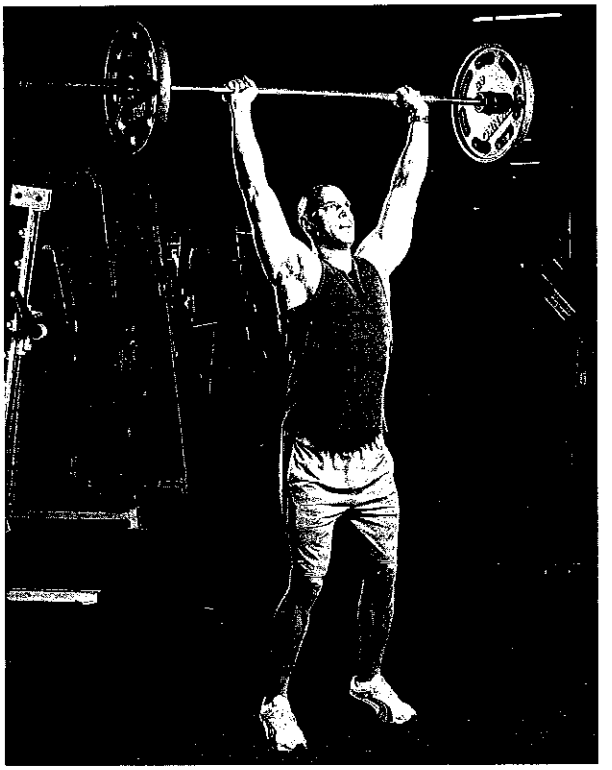
Stand while holding a barbell in front of your thighs with an overhand grip. Both your hands and feet are shoulder-width apart. Your knees are slightly bent and your torso is leaned forward slightly.

MOVE

Pull the bar upward in an explosive manner by extending the hip, knee, and ankle joints in a jumping motion. Simultaneously shrug your shoulders, then pull with your arms, bringing the bar as high as possible. Slowly lower the bar to thigh level.



Push Press



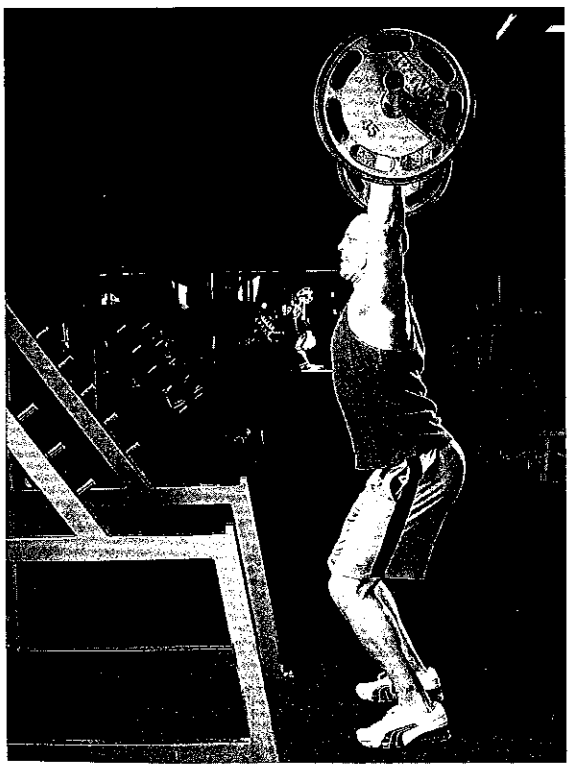
START

Assume a front squat starting position.

MOVE

Bend slightly at the knees and then explode upward onto the balls of your feet, simultaneously pressing the bar overhead. Hold this position for a split second before returning to the bent-knee position.

Overhead Squat



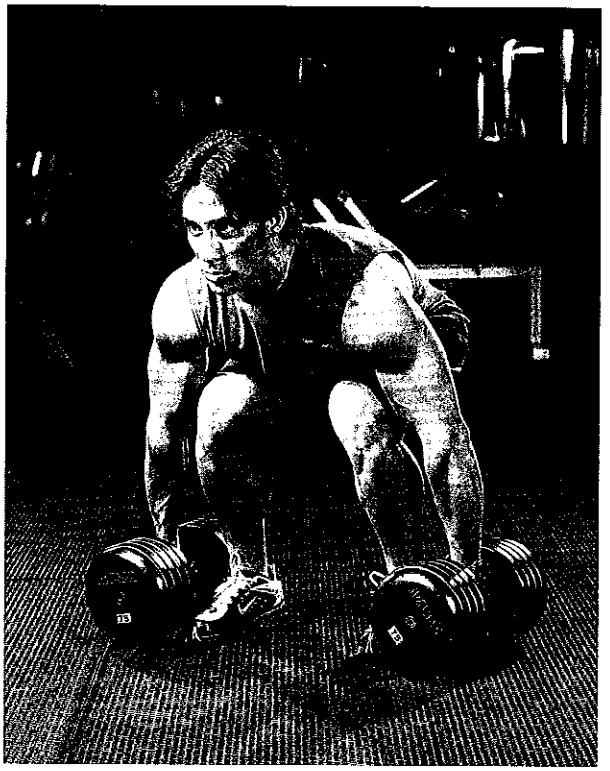
START

Press a barbell straight overhead with a wider-than-shoulder-width grip. Lock out your arms and hold the bar overhead.

MOVE

Squat down into a full squat, pause at the bottom, and return to a standing position while holding the bar overhead.

Dumbbell Deadlift



START

Stand with your feet shoulder-width apart with a dumbbell on the floor outside of each foot. Squat down to grab the dumbbells using a neutral grip, Your torso is bent at 45 degrees over the floor with your arms tensed and pulling on the dumbbells. Your thighs are slightly higher than parallel with the floor.

MOVE

Keep your abs pulled in tight and tense your entire body, then drive through your heels to straighten your knees and bring your hips forward until you are in a standing position with the dumbbells at your sides. Once standing, bring your shoulders back slightly and pause. Lower the dumbbells along the same path to the floor. Touch the weights lightly to the floor and begin your next rep.

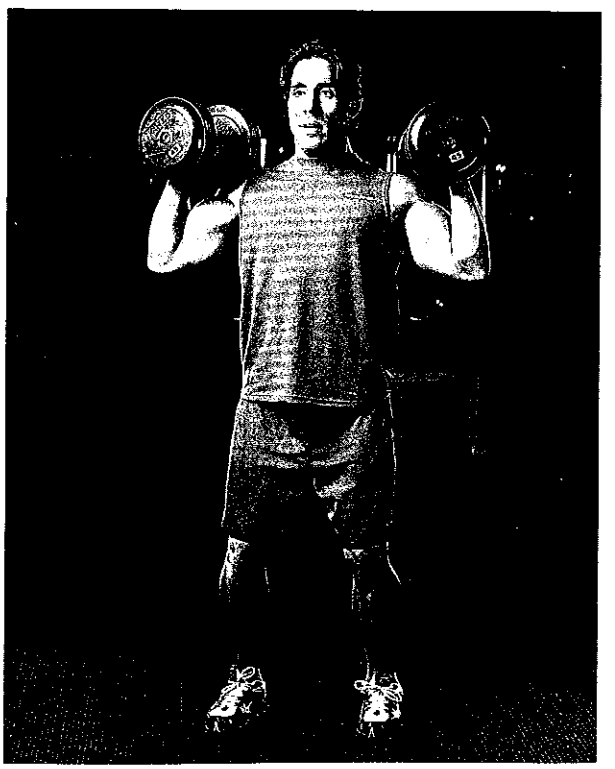
Dumbbell Clean and Jerk

START

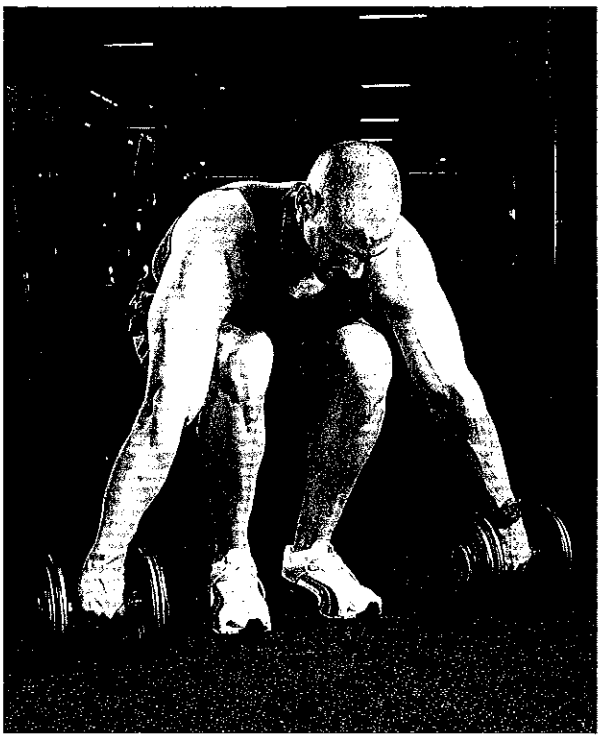
Stand with your feet shoulder-width apart with a dumbbell on the floor outside of each foot. Squat down to grab the dumbbells using a neutral grip, Your torso is bent at 45 degrees over the floor with your arms tensed and pulling on the dumbbells. Your thighs are slightly higher than parallel with the floor.

MOVE

Keep your abs pulled in tight, and tense your entire body. Drive explosively through your heels to straighten your knees and bring your hips forward until the dumbbells are at hip height. Pull the dumbbells up to your shoulders and squat under them as you catch them on your shoulders and whip your arms around so that the elbows are pointing forward. Extend at the hips and knees so that you are standing straight up with a slight bend in the knees and with the dumbbells resting on your shoulders. Extend forcefully at the knees and hips as you press the dumbbells straight overhead. Return the dumbbells back to the starting position.



Dumbbell Snatch



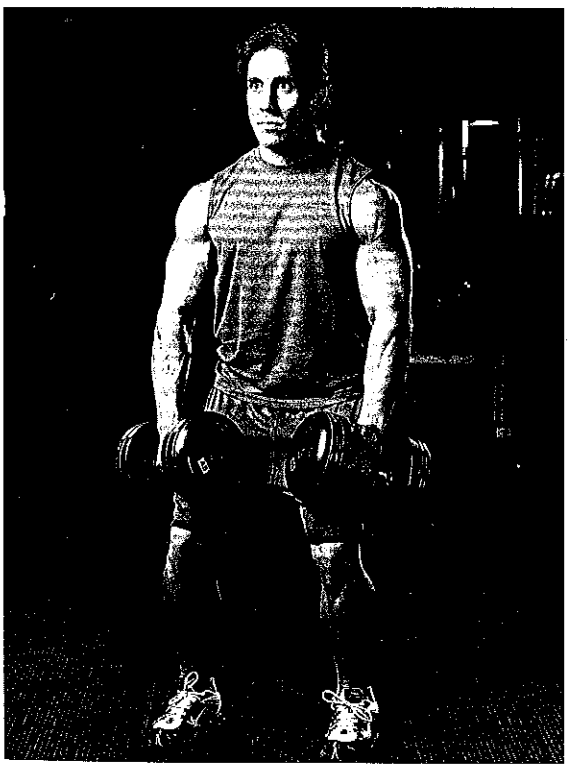
START

Stand with your feet hip-width apart with a dumbbell on the floor outside of each foot. Squat down to grab the dumbbells using an overhand grip. Your torso is bent at 45 degrees over the floor with your arms tensed and pulling on the dumbbells. Your thighs are slightly higher than parallel with the floor.

MOVE

With one smooth motion, forcefully extend at the hips and knees as you swing the dumbbells forward and up with your arms. The extension at the hips and knees should be minimal—just enough to start the dumbbells moving from the floor. Immediately squat back down by flexing at the hips and knees as you extend the dumbbells straight overhead. With the dumbbells extended straight overhead, forcefully extend at the hips and knees to stand straight up. Return the dumbbells back to the floor.

Dumbbell Power Clean



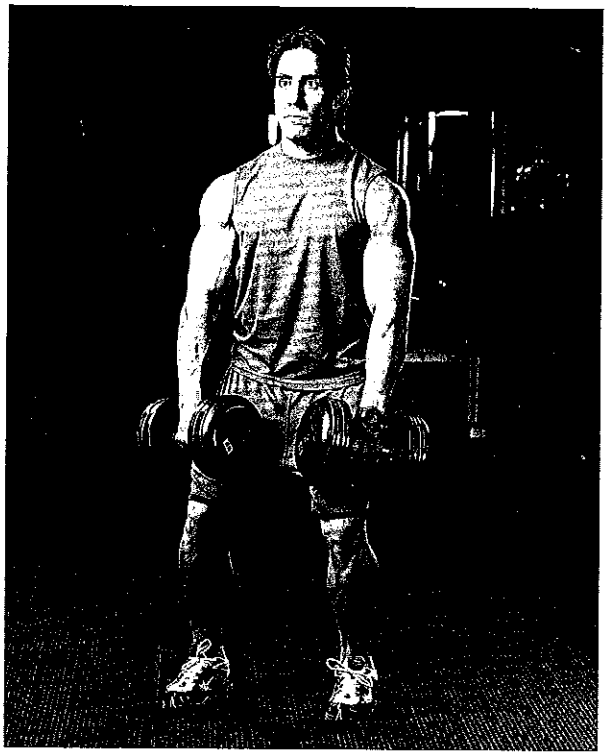
START

Stand with your feet shoulder-width apart with a dumbbell on the floor outside of each foot. Squat down to grab the dumbbells using a neutral grip, Your torso is bent at 45 degrees over the floor with your arms tensed and pulling on the dumbbells. Your thighs are slightly higher than parallel with the floor.

MOVE

Keep your abs pulled in tight, and tense your entire body. Drive explosively through your heels to straighten your knees and bring your hips forward until the dumbbells are at hip height. Pull the dumbbells up to your shoulders and squat under them as you catch them on your shoulders and whip your arms around so that the elbows are pointing forward. Extend at the hips and knees so that you are standing straight up with a slight bend in the knees and with the dumbbells resting on your shoulders. Carefully return the dumbbells to the floor.

Dumbbell Hang Clean



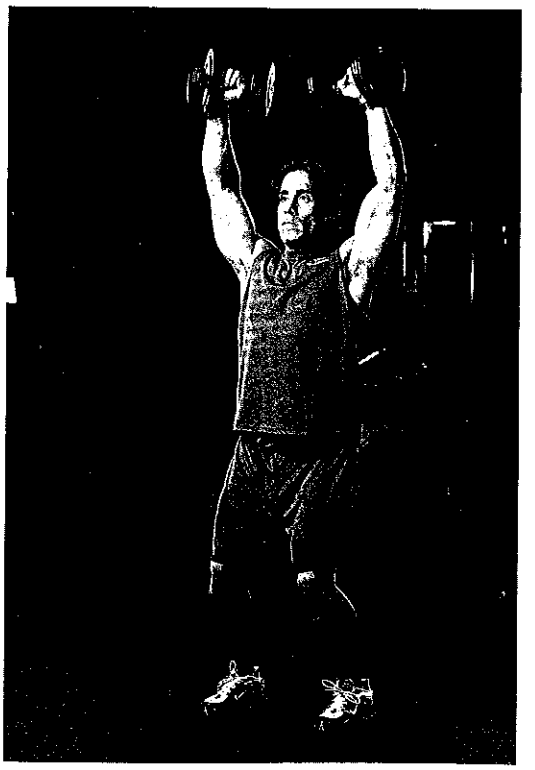
MOVE

This exercise is similar to the dumbbell power clean, but you start by holding the dumbbells at the sides of your thighs.

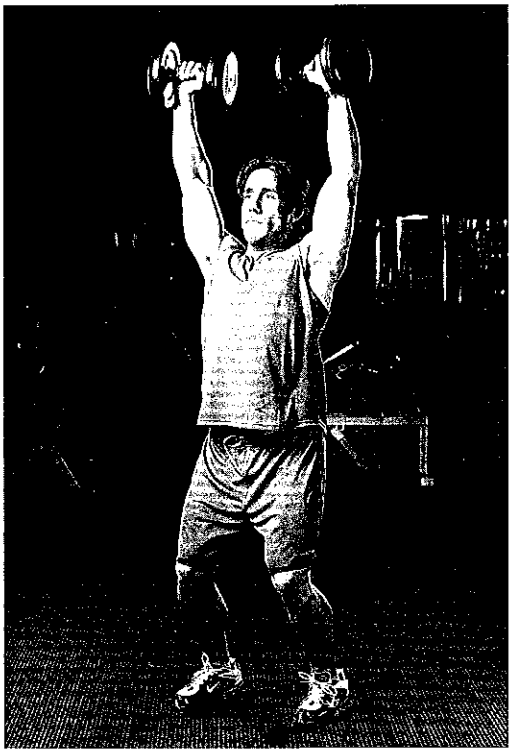
Dumbbell Push Press

MOVE

This exercise is similar to the part of the dumbbell clean and jerk where the dumbbells rest on your shoulders.



Dumbbell Overhead Squat



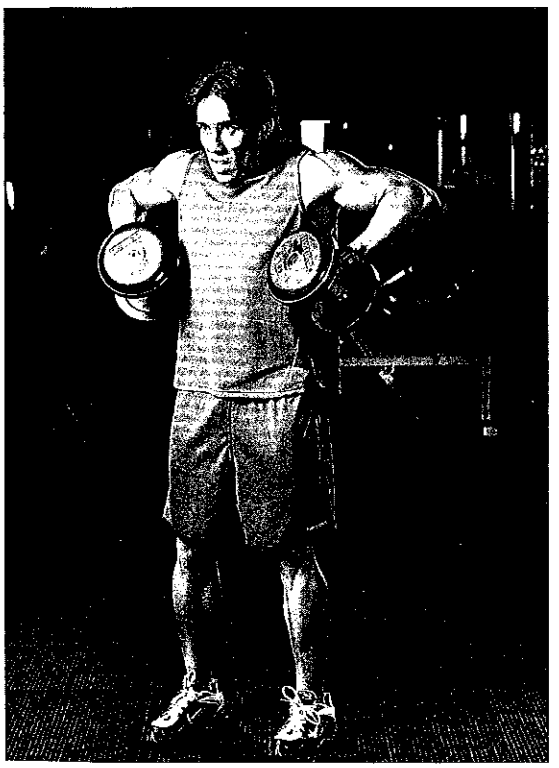
START

Press a pair of dumbbells straight overhead with an overhand grip and lock out your arms to hold the dumbbells overhead.

MOVE

Squat down into a full squat, pause at the bottom, and return to a standing position while holding the dumbbells overhead.

Power Dumbbell Raise



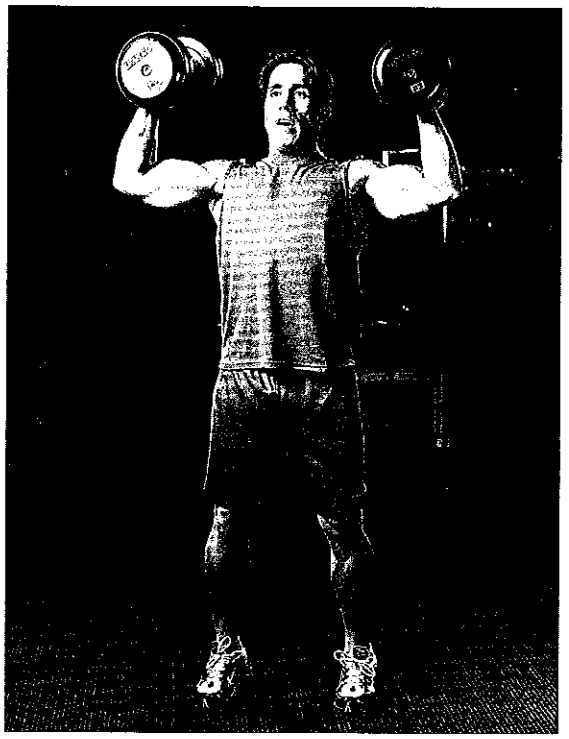
START

Stand erect while holding a pair of dumbbells at your sides. Knees are slightly bent, feet are shoulder-width apart, and toes are slightly pointed out.

MOVE

Bend your knees slightly and then straighten them as you raise the dumbbells up toward your armpits. As the weights approach that position, push off the balls of your feet.

Squat–Jump–Push–Press



START

In a shoulder-width stance, hold dumbbells at shoulder level so that your palms face each other.

MOVE

Descend into a full squat and then explode upward, jumping out of the squat as you press the weights to full extension so that your feet leave the floor. As you land, lower the weights back to your shoulders, making sure to bend your knees to "catch" them smoothly. Descend immediately into another rep.

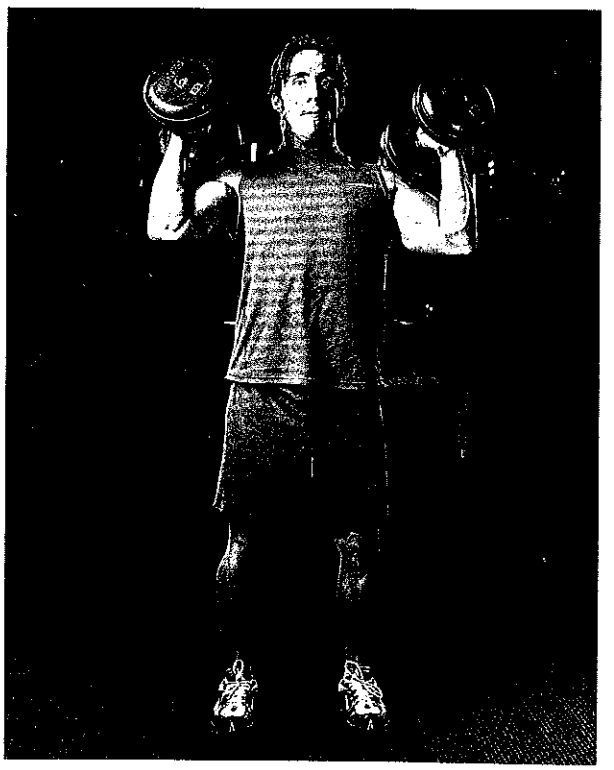
Dumbbell Squat and Overhead Press

START

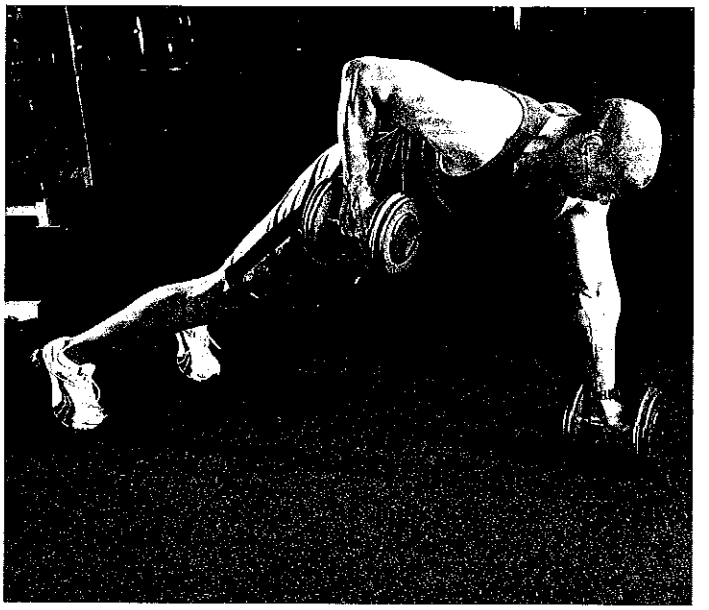
Hold two dumbbells at shoulder level as though you were about to perform a shoulder press. Keep your low back arched. Feet are slightly wider than shoulder width and toes are pointed out slightly.

MOVE

Squat down, holding the dumbbells in position at shoulder level. Pause for a second at the bottom when your thighs reach parallel with the ground, then drive back up to the starting position. When your knees are almost fully extended, press the dumbbells overhead. Finish with your arms fully extended overhead with your elbows straight but not locked. Slowly lower the dumbbells back to shoulder level and begin the next rep.



Dumbbell Push-Up and Row



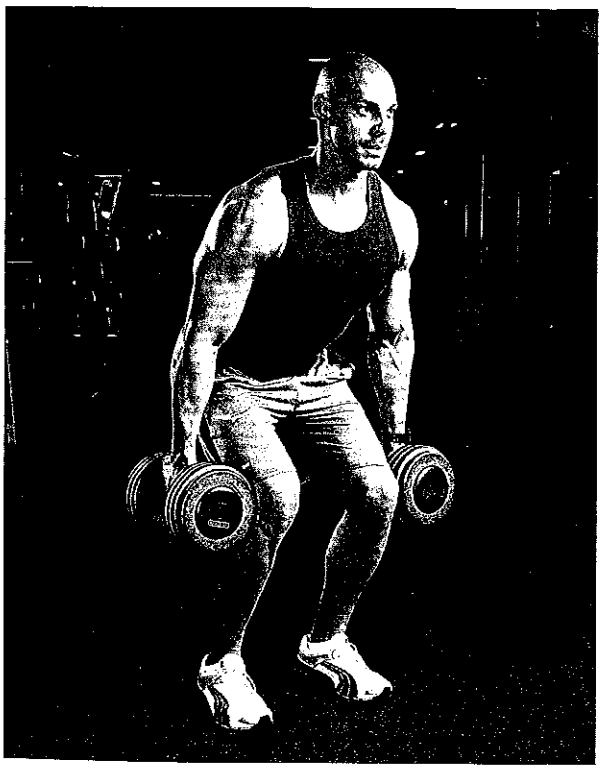
START

Place two dumbbells about shoulder-width apart on the floor. Get set in the bottom of a push-up position with your hands holding on to the weights. Place your feet about one to two feet (30.5 to 61 centimeters) apart for support and balance.

MOVE

Press yourself up by extending your elbows until your upper body is completely off the floor. When your elbows are fully extended, shift your body weight to your left arm and row the right dumbbell up to your right side, keeping your elbow as close to your body as possible. Lower the dumbbell back to the floor, shift your body weight over to your right side, and row the left dumbbell up to your left side. Lower the weight back to the floor and then lower your upper body back to the floor by bending your elbows. That completes one rep.

Dumbbell Deadlift and Upright Row



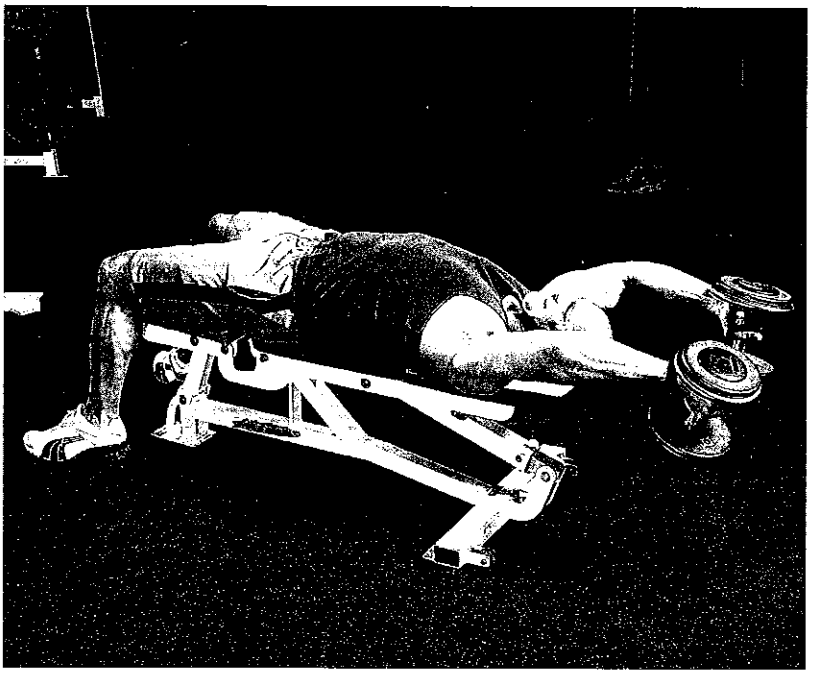
START

The start is similar to the start of the dumbbell deadlift.

MOVE

Drive through your legs to lift the weights to a standing position. From there, go immediately into a dumbbell upright row, keeping the weights close to your body and pulling them higher than mid-chest level. Slowly reverse the movements to return the weights to the floor.

Dumbbell Pullover and Press



START

Grab a dumbbell in each hand with a neutral grip. Lie faceup on a flat bench with your feet planted firmly on the floor. Extend your arms toward the ceiling from your shoulders. Bend your elbows slightly.

MOVE

Lower the dumbbells straight back over and behind your head. The dumbbells should be just slightly lower than the level of the bench. Contract your lats to pull your arms back up to the start, then bend your elbows to lower the dumbbells toward the outside of your pecs. When you reach the bottom, drive the weights up by forcefully extending your arms.

Appendix: Metric Equivalents for Dumbbells and Weight Plates

Following are tables giving conversions for common dumbbell and weight plate increments. For weights not listed here, you can calculate conversions using this equivalent: 1 kilogram = 2.2 pounds.

Pound Increments Converted to Kilograms

DUMBBELLS	
Pounds	Kilograms
5	2.3
10	4.5
15	6.8
20	9
25	11.4
30	13.6
35	15.9
40	18.2
45	20.5
50	22.7
WEIGHT PLATES	
2.5	1.1
5	2.3
10	4.5
25	11.4
35	15.9
45	20.5

Kilogram Increments Converted to Pounds

DUMBBELLS	
Kilograms	Pounds
2.5	5.5
5	11
7.5	16.5
10	22
12.5	27.5
15	33
17.5	38.5
20	44
22.5	49.5
25	55
30	66
WEIGHT PLATES	
1.25	2.75
2.5	5.5
5	11
10	22
15	33
20	44
25	55

Glossary

In every discipline there is a lexicon of common terms that members understand and use. These terms include both formal nomenclature and slang terms that have been established by the community. To better understand the language used in the chapters of this book as well as in the gym, consider the following terms. This collection of terms is not exhaustive; it includes only the definitions that are not found elsewhere in the book or those that need a clearer explanation.

abduction—Movement away from the body such as what occurs when you raise your arm straight out to the side.

abs—A slang term referring to the abdominal muscles.

adduction—Movement of a limb toward the body such as what occurs when your arm is straight out to your side and you lower it down to the side of your body.

adenosine triphosphate (ATP)—The molecular "currency" that provides energy in cells for everything from protein synthesis to muscle contraction.

adipose tissue—Where fat is stored in the body.

advanced weightlifter—A person who has strength-trained steadily and systematically for at least one full year.

aerobic exercise—Prolonged (usually performed for at least 20 minutes continuously), moderate-intensity exercise that uses up oxygen at or below the level at which the cardiorespiratory system can replenish oxygen in the working muscles. Common aerobic exercise activities are walking, jogging, running, cycling, stair climbing, working out on elliptical exercise machines, rowing, swimming, dancing, and aerobic dance classes.

agonist muscle—A muscle responsible for producing a specific movement through concentric muscle action. For example, during the biceps curl exercise, the biceps muscle is the agonist muscle.

anaerobic exercise—Exercise that is higher in intensity than aerobic work. Anaerobic exercise uses up oxygen more quickly than the body can replenish it in the working muscles. Anaerobic exercise uses stored-muscle ATP, phosphocreatine, and glycogen to supply its energy needs. Common anaerobic activities are weightlifting and sprinting.

antagonist muscle—The muscle responsible for actively opposing the concentric muscle action of the agonist muscle. Although this seems counterintuitive, the opposing force is necessary for joint stability during the movement. For example, during the biceps curl exercise, the triceps muscle is the antagonist muscle.

anterior—Anatomical term referring to the front of the body.

assistance exercise—Typically single-joint exercises such as the biceps curl, triceps extension, and deltoid lateral raise. These exercises involve only a single muscle group.

ATP—See *adenosine triphosphate.*

atrophy—Wasting away of any part, organ, tissue, or cell, such as the atrophy of muscle fibers caused by inactivity.

ballistic stretch—This type of muscle stretch involves dynamic muscle action in which the muscles are stretched suddenly in a bouncing movement. A ballistic stretch for the hamstrings might involve touching your toes repeatedly in rapid succession.

basal metabolic rate—The rate at which the body burns calories while awake but at rest (usually measured in calories per day).

beginning weightlifter—A person with less than six months of strength training experience.

belt—See *weight belt.*

bis—A slang term for the biceps muscles.

BMR—See *basal metabolic rate.*

bodybuilding—A type of strength training applied in conjunction with nutritional practices to alter the shape of the body's

musculature. The sport of bodybuilding is a competitive sport in amateur and professional categories for males and females.

body fat percentage—The amount of fat in your body, generally expressed as a percentage.

bulking up—To gain body size and mass, preferably muscle tissue.

burn—A slang term for the intense and painful sensation felt in a muscle that has been fatigued by high-rep sets.

cardio—See *aerobic exercise.*

chalk—Also known as magnesium carbonate, it is often used by powerlifters and Olympic lifters to keep the hands dry for a more secure grip on the weights.

cheating—The condition in which strict form is ignored in order to get a few additional reps out of a set. Cheating is not generally recommended because it can lead to injury. However, it can sometimes help a lifter push the muscles beyond muscle failure. An example of cheating would be forcibly swinging the upper body to help complete a standing biceps curl.

compound exercise—An exercise that involves more than one muscle group to perform the exercise. Therefore, movement occurs at more than one joint. For this reason, compound exercises are often called multijoint exercise. These types of exercises are the best choices for developing strength. Examples are the squat, bench press, and barbell row.

cool-down—Low-intensity exercise performed at the end of a high-intensity workout. The purpose of the cool-down is to allow the body's systems (cardiovascular, respiratory, metabolic, and so on) that were used during the workout to gradually return to resting levels.

core—The superficial and deep muscles of the abdominals and low back that stabilize the spine and help to prevent back injuries as well as enhance greater overall strength.

cross-training—Participation in two or more sports or activities that can improve performance in each and help an athlete achieve a higher level of fitness. Examples are strength training and football.

cutting—The process of dieting in an effort to shed all visible body fat to emphasize the individual muscles.

definition—Visibility of the shape and detail of individual muscles. This occurs in people with low body fat.

delayed-onset muscle soreness (DOMS)—Muscle soreness that develops a day or two after a heavy bout of exercise.

delts—A slang term referring to the deltoid muscles.

DOMS—See *delayed-onset muscle soreness.*

dorsiflexion—Moving the top of the foot upward and toward the shin.

EPOC—See *excess postexercise oxygen consumption.*

excess postexercise oxygen consumption (EPOC)—Elevated oxygen consumption above that of resting levels after exercise.

extension—The act of straightening a joint. For example, during the triceps pressdown exercise, the elbow extends. The opposite of extension is flexion.

failure—See *muscle failure.*

false grip—A type of grip in which the thumb remains against the side of the palm rather than wrapped around the bar as in a normal grip. This type of grip is not recommended because the bar can slip out of the hands.

fast-twitch muscle fibers—Muscle fibers that contract quickly and powerfully but not with great endurance. Fast-twitch muscle fibers are best developed through strength training programs that employ heavy weight and low reps or light weight and low reps that are performed in a quick and explosive manner.

flexibility—Suppleness of joints, muscle fibers, and connective tissues. This suppleness allows a greater range of motion about the joints. Flexibility is an important component of overall fitness and is best developed through systematic stretching.

flexion—The act of bending a joint. For example, during the biceps curl exercise the elbow flexes. The opposite of flexion is extension.

form—Refers to the use of proper biomechanics during an exercise. This means that all movements are performed in such a manner that only the required muscle groups are used during the exercise and all movements are performed in a safe manner to avoid the risk of injury.

GH—See *growth hormone.*

gloves—See *weightlifting gloves.*

glutes—A slang term for the gluteal muscles.

glycogen—The form of carbohydrate stored in the body, predominantly in the muscles and liver.

growth hormone (GH)—An anabolic hormone that stimulates fat metabolism and promotes muscle growth and hypertrophy.

hypertrophy—The scientific term denoting an increase in muscle size.

insertion—The point of attachment of a muscle most distant from the body's midline or center.

intermediate strength trainer—A person with 6 to 12 months of bodybuilding experience.

isolation exercise—An exercise that involves just one muscle group and the movement of the one joint that that muscle group crosses. These types of exercises are sometimes called single-joint exercises. Examples are the dumbbell fly, lateral raise, and leg extension.

knee wrap—A band of elastic fabric that is wound tightly around the knee to support the joint during squats and other heavy leg exercises.

knurling—A grooved or roughened area along the gripping portion of a barbell or dumbbell that lessens the tendency for the hand to slip.

lean body mass—Total body mass minus fat mass; this includes muscle, bone, organs, and water.

lifter—Slang term that refers to a person who regularly strength-trains.

macrocycle—A phase in periodization that typically involves six months to one year but may be up to four years, such as with Olympic athletes.

mass—A term used to refer to muscle size, as in muscle mass.

mesocycle—A phase in periodization usually lasting several weeks to months.

microcycle—A phase in periodization lasting a week.

multijoint exercise—See *compound exercise.*

muscle atrophy—See *atrophy.*

muscle failure—The point during an exercise at which the muscles have fully fatigued and can no longer complete an additional rep of that exercise using strict form.

muscle hypertrophy—See *hypertrophy.*

negative phase of repetition—A term used to describe the eccentric portion of a muscle contraction. Emphasizing the eccentric, or negative, portion of the rep induces greater muscle damage than that caused by the concentric portion of the rep. An example of a negative phase is the lowering of the weight down to the chest during a bench press.

Olympic weightlifting—The type of weightlifting contested at the Olympic Games every four years as well as at national and international competitions each year. Olympic lifting involves two lifts: the snatch and the clean and jerk.

origin—The point of attachment of a muscle closest to the body's midline, or center.

overhand grip—This type of grip, also known as a pronated grip, involves grabbing the bar with the palms down and the knuckles on the front or the top of the bar. An example is the grip used for the reverse barbell curl or shrug.

overreaching—Scientific term used to describe exercise training that pushes the body beyond its limits to recover and adapt. This usually involves training with too much volume, too much intensity, too much frequency, or all of these. Overreaching is the stage that occurs just before the athlete becomes overtrained. If an athlete stops overreaching in time, the athlete can avoid the deleterious effects of overtraining and actually rebound with rapid advances in strength and muscle mass.

overtraining—When an athlete overreaches for too long, he or she reaches the point of overtraining. Chronically exceeding the body's ability to recover by overreaching causes the body to stop progressing and actually lose some of the gains that were made in strength and muscle mass. Besides impairing athletic performance, overtraining can increase the risk of injury or disease. The early signs of overtraining from too much weight include increased resting heart rate, difficulty in sleeping, increased sweating,

and altered emotions. The early signs of overtraining from lifting too much volume or too often include decreased resting heart rate, digestion problems, fatigue, and lower blood pressure.

passive stretching—This type of stretching involves having a partner assist in moving joints through their ranges of motion. This allows for a greater range of motion than what can be reached when stretching alone.

peak—The absolute zenith of competitive condition achieved by an athlete.

pecs—A slang term that refers to the pectoralis muscles.

periodization—The systematic manipulation of the acute variables of training over a period that may range from days to years.

phosphocreatine (PCr)—An energy-rich compound that plays a critical role in providing energy for muscle action by maintaining ATP concentration.

plantar flexion—Moving the top of the foot away from the shin, such as when pointing the toes down for heel raises.

positive phase of repetition—The concentric portion of the repetition. Examples of the positive phase include the pressing of the barbell off the chest during the bench press and the curling up of the weight during a barbell curl.

powerlifting—A form of competitive weightlifting that features three lifts: the squat, bench press, and deadlift. Powerlifting is contested both nationally and internationally in a variety of weight and age classes for both men and women.

preexhaust—The use of single-joint exercises before multijoint exercises in an effort to exhaust a particular muscle group so that it becomes the weak link in the multijoint exercise.

primary exercise—An exercise that is most specific to the goals of the lifter. These exercises must involve the muscle groups in which the person is most interested in gaining strength.

pronation—Rotating the wrist inward.

prone—Lying horizontally on the abdomen.

pump—A term commonly used by bodybuilders to refer to the swelling that muscles undergo during a workout. The pump occurs because when muscles contract repeatedly they create metabolic waste products that draw water into the muscle. The greater water volume increases the overall size of the muscle cells. This can lead to temporary increases in total muscle size of one to two inches. The pump typically lasts until the metabolic waste products have been cleared from the muscle.

quads—A slang term referring to the quadriceps muscles on the front thigh.

range of motion (ROM)—The range through which a joint can be moved, usually its range of flexion and extension. Exercises also have a specific range of motion that involves the movement from start to finish.

rep—Slang term for repetition.

repetition—Refers to a single execution of an exercise. For example, if you curl a barbell through the entire range of motion once from start to finish, you have completed one repetition (rep) of the movement.

repetition speed—The length of time it takes to complete one rep.

resistance—The amount of weight used in an exercise. Sometimes referred to as *intensity*.

resting metabolic rate (RMR)—The metabolic rate measured under conditions of rest. This is the minimal number of calories a person will need during a day to maintain body weight.

rest interval—The brief pause lasting between 30 seconds and 2 minutes, and in some cases even longer, which occurs between sets to allow the body to partially recuperate before initiating the succeeding set.

ripped—A term that means a body has clearly visible muscles and very little fat.

routine—A term that refers to an individual training program.

RMR—See *resting metabolic rate*.

set—A group of consecutive repetitions of an exercise that are performed without resting.

single-joint exercise—See *isolation exercise*.

six-pack—A slang term used to refer to defined abdominal muscles. The term is used because

most people's abdominal muscles create six bulges (three per side) when they are well developed and body fat levels are low.

slow-twitch muscle fiber—A type of muscle fiber that has high endurance capacity and poor ability to generate quick, powerful contractions.

split routine—A training program in which the body is divided into segments and trained more than three times per week, as most beginners do. The most basic split routine is done four days per week. The most popular type of split routine involves dividing the body into three parts, which are worked over three consecutive days, followed by a rest day and a repeat of the routine on day five. This is called a three-on and one-off split.

spotter—A training partner or a person who gives assistance to a lifter while the lifter is performing an exercise. The purpose of the spotter is to be on hand in case the lifter fails to complete a rep. In this case, the spotter can help the lifter complete the rep, which allows the lifter to train past muscle failure as well as avoid injury on dangerous exercises such as the bench press.

stabilizer muscles—Muscles that assist in the performance of an exercise by steadying the joint or limb being moved but not increasing the force applied to move the weight.

staggered grip—A grip in which the left and right hand have opposite styles of grip. One hand uses an underhand grip while the other uses an overhand grip. This is a common grip used during the deadlift because the alternated gripping allows for stronger grip strength.

static stretch—A low-force, long-duration stretch that holds the desired muscle at the greatest possible length for 20 to 30 seconds.

sticking point—The point in an exercise where the muscle is at its weakest.

striations—Fine grooves or bands on the surface of a muscle. The grooves are caused by the molecular machinery of the muscle fibers that are visible through the skin in ripped bodybuilders.

supination—Rotating the wrist outward.

supine—Lying horizontally on the back.

synergist—A muscle that assists in the performance of an exercise by adding to the force required for executing the movement. For example, the triceps muscle is a synergist to the pectoralis muscles during the bench press exercise.

tendon—A band of dense white fibrous tissue that connects a muscle to a bone. The movement of the bone is produced by the transmission of force from the muscle through the tendon to the bone.

testosterone—The primary natural androgenic and anabolic steroid hormone produced primarily by the testes in the male. It is also produced in smaller quantities by the adrenal glands in both males and females. Testosterone is the hormone responsible for maintenance of muscle mass and strength as well as the development of secondary male sexual characteristics such as a deep voice, body and facial hair, and male pattern baldness.

training log—A log that a lifter keeps for recording workouts. The information recorded usually includes exercises performed, weight used, number of sets performed, number of reps completed per set, amount of rest taken between sets, how the lifter felt during or after exercises, and what the lifter ate before and after the workout. This information helps the lifter assess progress and stay motivated to reach goals.

training partner—A person who trains with you on the majority of your training days.

traps—A slang term for the trapezius muscles.

tris—A slang term referring to the triceps muscles.

underhand grip—The opposite of an overhand grip. The lifter should grip the barbell or dumbbell with the hands under the bar.

vascularity—The visibility of veins through the skin.

volume training—The use of a very high number sets for each bodypart.

warm-up—Before any workout it is important to gradually prepare the body through low-intensity exercise. This helps to get the heart rate elevated so that oxygen uptake and blood flow to muscle tissue are enhanced. It also increases body temperature, which enhances

the mobility of joints and the contractibility of muscle fibers. Good warm-up exercises include walking on a treadmill, riding a stationary cycle, doing light calisthenics, and doing lightweight lifting slowly and rhythmically.

washboard abs—a slang term used to describe ripped abs.

weight belt—A wide belt usually made of leather or nylon that is worn tightly around the waist to help support the low back and increase abdominal pressure. This is supposed to help prevent back injury and increase strength. Today it is recommended that belts be worn only during exercise training in which near-maximal weights are being lifted.

weightlifting gloves—Gloves made of leather or synthetic materials are often worn during weightlifting to aid in the grip and prevent calluses from developing on the palms.

working set—The set performed after finishing the warm-up sets.

workout—A single training session.

wrist straps—Strips of material (often canvas, nylon, or leather) that are about 2 inches (5 centimeters) wide and 12 inches (30.5 centimeters) long with a looped end. They are wrapped around the wrist and the bar or handle that the lifter is holding onto to increase grip strength.

wrist wraps—Bands of elastic material that are tightly wrapped around the wrists to support them during heavy lifting or while performing exercises that place a high amount of stress on the wrists.

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About the Author

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Jim Stoppani, PhD, served as a postdoctoral research fellow in the prestigious John B. Pierce Laboratory and department of cellular and molecular physiology at Yale University School of Medicine, where he investigated the effects of exercise and diet on gene regulation in skeletal muscle. Stoppani was awarded the Gatorade Beginning Investigator in Exercise Science Award in 2002.

Currently, Stoppani serves as senior science editor for *Muscle & Fitness* and *Flex* magazines at Weider Publications in Woodland Hills, California. He is a member of the National Strength and Conditioning Association (NSCA), American College of Sports Medicine (ACSM), International Society of Sports Nutrition (ISSN), and American Alliance for Health, Physical Education, Recreation, and dance (AAHPERD). Stoppani received his doctorate in exercise physiology from the University of Connecticut in 2000.

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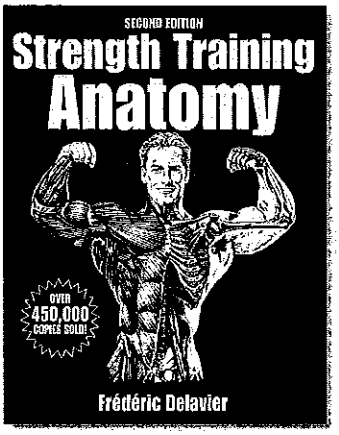

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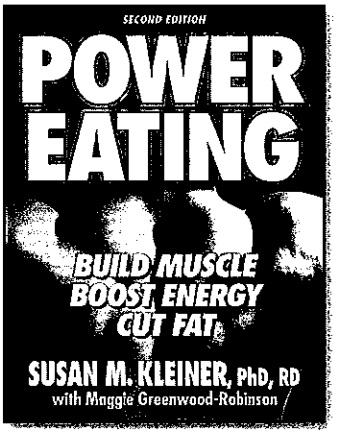

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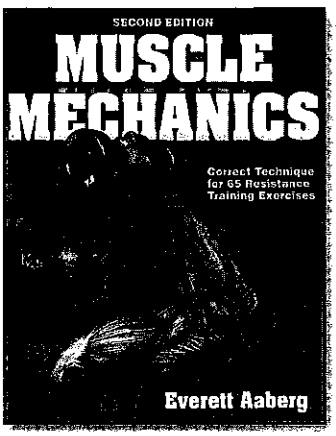

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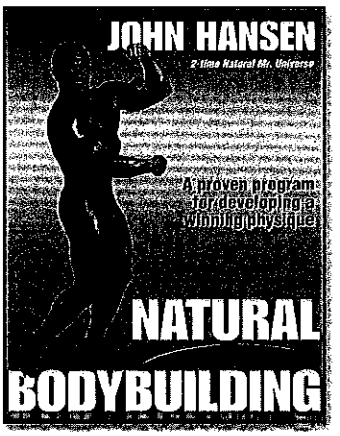

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