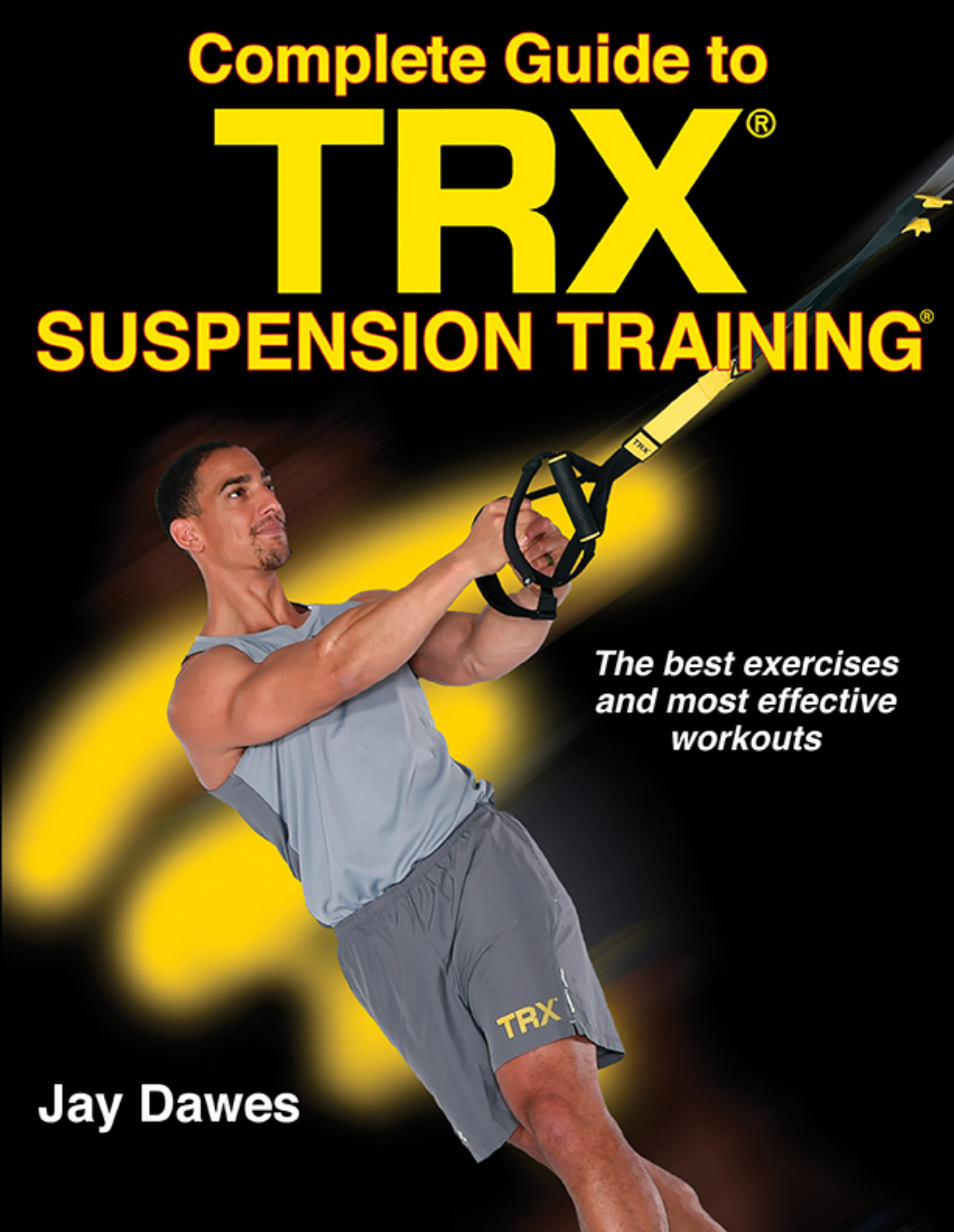
Complete Guide to TRX® SUSPENSION TRAINING®



The best exercises and most effective workouts

Jay Dawes

Complete Guide to TRX® Suspension Training®

Jay Dawes

HUMAN KINETICS

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For my amazing wife, April; my children, Gabrielle, Addison, and Asher; and my mother.

—Jay Dawes

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EXERCISE FINDER

(continued)

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INTRODUCTION

Over the years, Suspension Training® has continued to grow in popularity. Spawned from traditional gymnastics training, suspension training takes advantage of the physical laws of nature to improve physical fitness. Using the basic principles of physics, Suspension Training allows the user to manipulate the resistance created by one's own bodyweight to provide the necessary physical stressors for developing and maintaining health and fitness.

Suspension Training as we know it today became popular as a way to develop and maintain fitness among certain populations when traditional fitness equipment was not available. For example, U.S. Navy SEALs used Suspension Training when deployed in austere environments to maintain their fitness and occupational readiness. However, to create such devices, they typically used GI belts and nylon webbing designed to secure equipment to pallets. This concept was eventually commercialized and is now used in a wide variety of health clubs, by sports teams at every level, and in rehabilitation settings.

Working with older first responders (i.e., police, firefighters), masters athletes, and collegiate athletes, many of whom with multiple chronic injuries, required our training staffs to create modifications that could help them maintain and improve performance without aggravating any preexisting conditions. Introducing Suspension Training into their regular training programs provided a safe, versatile, and effective way for them to attain their goals. We found that individuals who started with a regular routine of suspension training experienced increased functional strength, decreased chronic pain, lower injury rates, and better results when performing traditional weightlifting and resistance training routines.

Suspension Training has a place in practically every type of training program. It can be used to develop core strength, mobility, joint strength and integrity, and basic and foundational strength, as well as to target specific strength goals. It can serve as a stand-alone training program or be used with another training program. Whatever the goals, suspension training can help an individual achieve success and improve training outcomes.

Science of Suspension Training

At this time, research on Suspension Training is minimal. However, several basic scientific principles support its use as a training modality. Part I presents some of the science behind Suspension Training and explains how to use these principles to guide training and maximize results.

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CHAPTER 1

Foundation of Suspension Training

It is generally well accepted that performing resistance training on a regular basis can help maintain and improve health, fitness, and quality of life. However, people often encounter obstacles to resistance training, such as time, space, equipment, and cost. Suspension Training® offers a unique approach to resistance training that requires only one portable piece of equipment, and it can be done almost anywhere. In addition, Suspension Training exercises can be used to address a wide range of fitness needs such as enhancing and maintaining general fitness, improving sport performance, and as a rehabilitation or injury prevention tool. This mode of training can be used as a stand-alone exercise regime or be integrated it into a more traditional training program to add variety and prevent staleness and boredom. Additionally, Suspension Training is popular among those who are traveling or who do not have access to a training facility because of its versatility and portability. Based on this, it is no wonder this form of training has become so popular.

Although Suspension Training seems to be a very straightforward concept, a good deal of science is involved in setting up a workout. Suspension Training is based on principles of anatomy, exercise physiology, physics, and biomechanics. The better these principles are understood, the more Suspension Training will make sense as a training option. However, one of the primary goals of this book is to keep it simple. This chapter presents some basic principles to help the reader manipulate training programs and learn how to progress or regress exercises to change the intensity of a training program. It also presents foundational program design concepts to help in the development of fun, challenging, and productive training sessions.

By using a single-point anchor, Suspension Training allows users to take advantage of some basic principles of physics, including Newton's law of gravitation using force vectors, center of gravity, and pendulum. Creating resistance or force requires changing the direction of the force. The Suspension Trainer™ has a single-point anchor with straps, handles, and foot cradles that are perpendicular to the floor when it is allowed to hang, as a result of the object's center

of gravity. When a person grabs the handles, mass increases (due to the person's body mass), resulting in a change in the object's center of gravity. Changing the angle of the straps on the Suspension Trainer changes the application, or direction of the force on the musculoskeletal system, thereby increasing the force of pull, or resistance placed on the body. The result of these forces, or force vectors, and the center of gravity being pulled away creates gravitational potential energy. A single-point anchor system creates a pendulum, converting gravitational potential energy and kinetic energy into work, or resistance.

A variety of ways are available to manipulate the intensity or difficulty of a Suspension Training program based on these principles. For the purposes of this text, *intensity* will be defined as increasing the load on the musculoskeletal system, or increasing the absolute load (i.e., amount of weight which must be moved) such as when changing the vector resistance, angle, or pendulum. *Difficulty* will be defined as any variations that may increase the complexity, or stability demands of a movement or action (e.g., single-arm, single-leg, balance, coordination). Stepping toward or away from the single-point anchor (depending on the exercise), and thus increasing the angle of pull, increases the intensity of an exercise. Ground contact is necessary to resist the forces that are trying to bring the mass back to perpendicular. The wider the floor contact base in the direction of the force vector is, the easier it is to resist the force vector. On the contrary, the narrower the ground contact base in the direction of the force vector is, the more difficult it is to resist the force vector. Consider the game tug of war. As one opponent pulls, creating a force vector, the other opponent must split the feet from front to back to keep from being pulled forward. This increases the base of support along the direction of pull created from the resultant vector, increasing stability along this vector.

There are three methods for varying the intensity or difficulty, or both, of a single-point anchor Suspension Trainer. These methods include:

- changing the stability demands of the exercise (e.g., from dual handles to a single handle, or by altering stance),
- manipulating the angle of pull, and
- changing the position of the center of gravity.

Base of Support

The body's base of support and center of gravity affect exercise intensity. Increasing the base of support makes a person more stable, which makes the exercise easier. Narrowing the base of support increases the difficulty by reducing stability. The most difficult base of support is a single limb (one foot, one arm). See figure 1.1 for examples of base of support levels.

FIGURE 1.1 Bases of support: *(a)* easy, *(b)* moderate, *(c)* harder, *(d)* hardest.

Angle of Pull

Changing the angle of pull increases exercise intensity. It also changes the angle of the body in relation to the ground. Also, increasing the lever arm, or movement arm, of gravitational pull increases the exercise intensity. In other words, the farther the person is from vertical, the greater the resistance will be. See figure 1.2 for examples of angles.

FIGURE 1.2 Angles of pull: *(a)* easy, *(b)* moderate, *(c)* harder.

Pendulum

The pendulum is used in ground exercises in which the feet are placed in the Suspension Trainer and the hands are off the ground. The center of gravity in relation to the perpendicular gravitational pull determines exercise intensity. Exercises in which the head and feet are on the same side in relation to the anchor point are more difficult than those in which the head and feet are on opposite sides of the anchor point—with some exceptions. See figure 1.3 for pendulums.

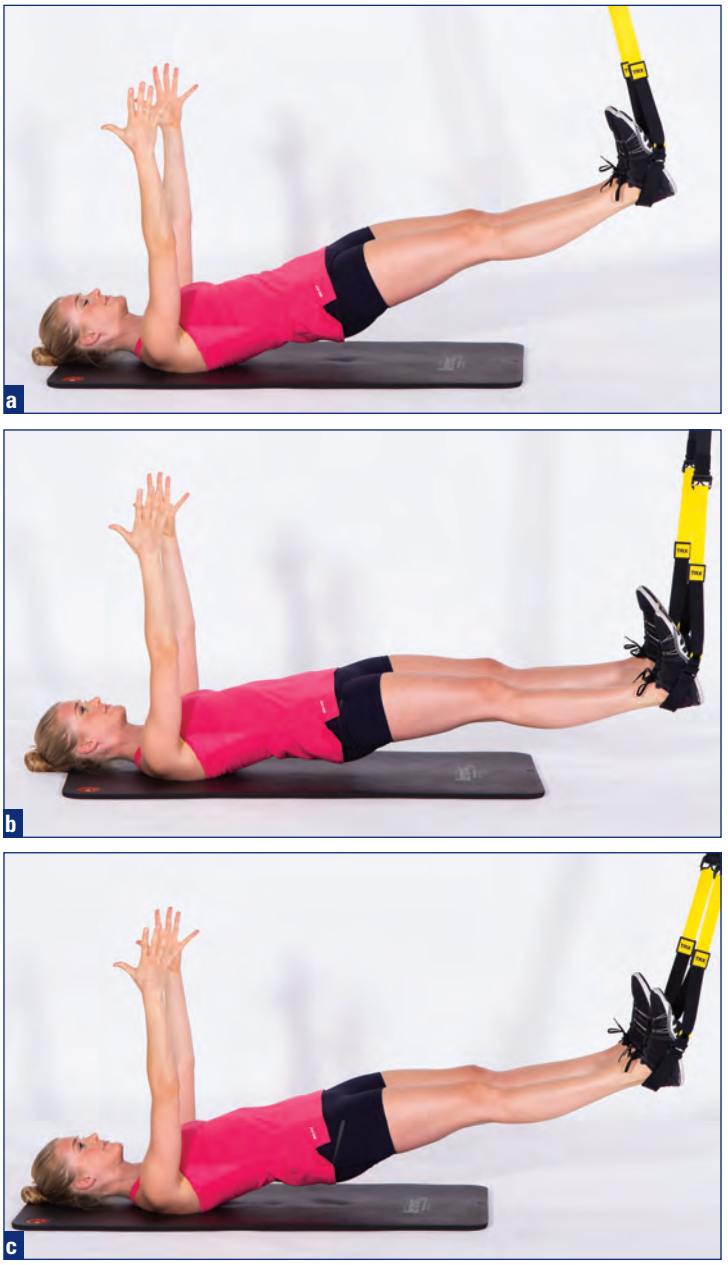

FIGURE 1.3 Pendulums: *(a)* easy, *(b)* moderate, *(c)* harder.

Handles

Using a single handle can increase the difficulty and intensity of some exercises by increasing the amount of neuromuscular control and stability needed to maintain the position. The single-handle grip also creates a significantly greater training demand on the core. When performing exercises unilaterally, on the side of the body with the free arm or leg, gravity tends to pull the body into rotation. Resisting the rotation is an excellent way to build trunk stability and reduce injury potential. Furthermore, unilateral type exercises (i.e., one hand or one foot in the straps) create off-center loading and require greater joint stabilization than traditional bilateral exercises, in which the loads moved are more evenly distributed. Used appropriately, this can provide a great alternative method of developing joint strength and stability.

For single-handle exercises to be safe, the handles must remain together during the exercise. This can be accomplished by grasping one handle in each hand (see figure 1.4*a*). Next, pass the handle in the right hand through the left-handle triangle (see figure 1.4*b*). Now take the handle in the right hand and pass it through the left-handle triangle (see figure 1.4*c*). Firmly pull down, cinching the handles together (see figure 1.4*d*). Test the security prior to performing the exercise.

FIGURE 1.4 Single-handle setup.

Exercises using one limb, either an arm or a leg, require the double-handle setup for most individuals (see figure 1.5). The use of a single handle when a single arm or leg is in contact with the ground requires high levels of coordination, balance, and strength. Only experienced individuals with high levels of strength should attempt such progressions.

FIGURE 1.5 Double-handle setup.

Stance

Foot position is important for modifying the intensity of exercises performed while standing. The wider the base of support is, the lower the intensity and difficulty of the exercise will be. The narrower the base of support is, the more intense and difficult the exercise will be. Any base of support can be adjusted during the exercise to increase or decrease difficulty. The following are the seven basic positions:

- *Shoulder-width*—Stand so that the instep of the foot is in line with the armpits (see figure 1.6*a*).
- *Hip-width*—Stand so that the feet and ankles are directly under the hips (see figure 1.6*b*).
- *Feet together*—Stand so that the feet are touching (see figure 1.6*c*).
- *Staggered*—Stand so that the feet are hip-width apart and the toes of one foot are in line with the instep of the other foot (see figure 1.6*d*).
- *Single-leg*—Stand on one foot (see figure 1.6*e*).
- *Lunge*—Stand so that the feet are hip-width apart. Move one leg backward and the other forward. Bend the forward knee until the shin is perpendicular to the foot. Bend the knee of the back leg until it forms a 90-degree angle. The foot of the front leg should be flat on the ground. The heel of the back foot should be raised, and the weight should be supported on the ball of the foot (see figure 1.6*f*).
- *Plank*—Stand so that the upper body, hips, and legs are in line with one another forming a long ridged lever (see figure 1.6*g*).

FIGURE 1.6 Suspension Training stances: (*a*) shoulder-width, (*b*) hip-width, (*c*) feet together, and (*d*) staggered.

FIGURE 1.6 Suspension Training stances: *(e)* single-leg *(f)* lunge, and *(g)* plank.

Suspension Training can be a very effective way to improve health, fitness, and performance. An understanding of the basic scientific principles behind Suspension Training will help in the creation, progression, and regression of a variety of exercises regardless of training level. The chapters that follow describe how to use these principles to develop comprehensive training programs.

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CHAPTER 2

Benefits of Suspension Training

As mentioned in chapter 1, Suspension Training is very popular because of its versatility, portability, and cost effectiveness. This chapter outlines the many benefits of this unique form of body weight training.

Functional Training

Functional training is a popular buzzword in the fitness community. Over the years, the term has been used to describe exercises performed with a variety of novel types of training equipment (e.g., balance discs, kettlebells, resistance tubing, Indian clubs). However, it is important to stress that a device does not make an activity functional. Furthermore, performing exercises that look similar to those in which one would like to improve, but whose underlying physical characteristics are different, may hinder performance. For example, running while towing a weighted sled can be functional; however, if the sled is weighted too heavily, the runner will have to counteract the load by increasing torso forward lean. This may alter the biomechanics of the activity and also engrain poor movement mechanics, interfering with motor programming.

Now that we have an idea of what is not functional, let's discuss what *is* functional. In simple terms, *function* can be defined as a desired purpose. In relation to human performance, most often *function* refers to the ability to move fluidly at the required speed and using the appropriate amount of force to execute a given task. Therefore, functional training may be defined as any form of training that improves movement quality and enhances a performance outcome (Siff 2003).

Rather than thinking of exercises as either completely functional or completely nonfunctional, we can think of all exercises as on a continuum. The functionality of an exercise is largely determined by the amount of carryover, or transfer, it has to a given activity. For example, if a training goal is to improve performance in the pull-up, the exercise with the highest likelihood of meeting

this goal would be the exercise itself. However, performing other exercises for the back, such as a suspension row, lat pull-down, seated row, or bent-over dumbbell row, may improve performance in the pull-up because they develop similar muscle groups. Even the biceps curl, which is normally considered a nonfunctional isolation exercise, can improve pull-up performance because the biceps are secondary movers in this action. Another example is the glute bridge. Although this exercise does not appear to have a direct relationship to any athletic movements, it strengthens the glutes, which are essential for controlling the hips during movements such as running and jumping. Poor glute strength may also contribute to valgus collapse (i.e., the knees moving inward while running, sprinting, and jumping), making an athlete more prone to injury.

In general terms, exercises that require stability through increased synergy have increased functional value (Orr 1999). Most activities, whether in sport or daily life, require us to move effectively and to manipulate our bodies to produce, reduce, and stabilize forces (see figure 2.1). This requires a combination of both stability (i.e., resistance to movement) and mobility (i.e., the ability to move). Although these concepts appear to be diametrically opposed, without one the other suffers. Producing efficient movements at the joints requires a base of stability (i.e., proximal stability) that allows the arms and legs to move fluidly through their intended ranges of motion (i.e., distal mobility). Consequently, inadequate mobility or stability may compromise movement. This is the reason for emphasizing proximal stability and motor control of the trunk first in the training program. Doing so optimizes distal mobility.

When using a Suspension Trainer, one or both limbs of either the upper or lower body are supported in handles or foot cradles. At the other end of the Suspension Trainer is an anchor point. The design of this device increases the demands on the user to control their body weight in multiple planes of movement and at multiple joints, while adding varying and progressive degrees of instability. Thus, the user must often recruit more muscles to remain stable while performing a movement. This improves what is referred to as top-down stability. Other devices, such as gymnastics rings, also develop top-down stability. However, unlike rings, most Suspension Trainers use a single anchor point with a limited-slip locking loop. This allows the user to add progressive amounts

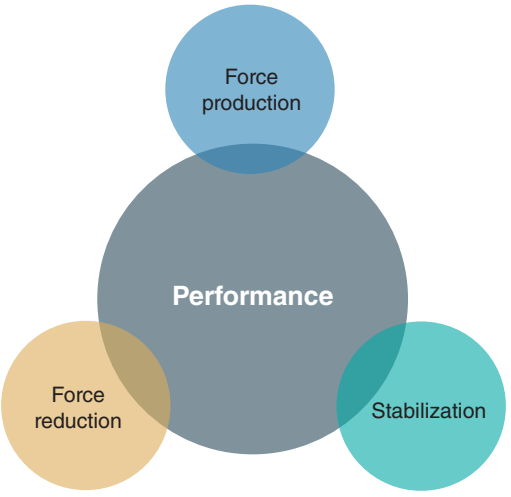

FIGURE 2.1 Essential elements of performance.

of instability to the training programs, which may improve joint stability and body awareness and increase the muscular activity of the core.

Although instability may hinder the total amount of force produced by the prime movers when compared to training in a stable environment, the stabilizer muscles around the joints and the trunk may become more active to resist unwanted motion. Therefore, Suspension Training can be particularly useful for athletes in overhead sports (e.g., baseball, softball, volleyball, and handball players, and quarterbacks in American football) because it may improve scapular control and strength in the muscles of the serratus anterior and those surrounding the shoulder. These improvements may help prevent both acute and chronic shoulder injuries. Suspension Training may also improve kinesthetic awareness and proprioception. This is simply a greater awareness of where the body and joints are in time and space. Enhancing these qualities may have a positive impact on performance as well as aid in reducing injury risk. Furthermore, shoulder injuries are very common in the general population because this ball-and-socket joint can be compromised during overhead lifting and lowering activities. Therefore, top-down instability training may also improve performance in activities of daily living and in recreational sports and resistance training, and reduce injury in the general population.

From a functional perspective, Suspension Training may challenge the trunk stabilizer muscles. Since Suspension Training increases the stability challenges of the trunk and the joints, these exercises may be well suited as preparation to lift heavier resistance. As one attempts to stabilize the joints, contractions of the agonist and antagonist muscle groups that surround the joints may contribute to a greater neuromuscular activation. Because a base of stability is required to produce and reduce force, Suspension Training exercises may be performed as a dynamic warm-up prior to more traditional and complex exercises. For example, a suspension push-up or chest press may be performed prior to a bench press to stimulate, or activate, the stabilizer muscles surrounding the shoulder prior to overloading the prime movers (e.g., pectoralis major, anterior deltoids, and triceps). Additionally, the Suspension Trainer can turn traditional single-joint isolation exercises, such as the biceps curl, into total-body exercises by increasing the demand for core stabilization. Given that the ability to resist unwanted motion in the trunk, or core, is essential in many activities of daily living and sport, this variation may be considered more functional than a similar exercise performed while seated or using a machine with a fixed movement path.

Fitness and Performance

Suspension Training has been shown to improve a variety of fitness and performance measures in recreationally active populations. Janot and colleagues (2013) found that younger (19 to 25 years) adults experienced significant improvements in flexibility, balance, core endurance, and lower-body strength when performing exercises twice a week for seven weeks using a Suspension Trainer. In this same study, the researchers also discovered that middle-aged (44 to 64 years) adults using Suspension Training experienced significant improvements in both core endurance and lower-body strength as well as improved, yet not statistically significant, increases in balance and flexibility. These improvements were similar to those of people performing traditional resistance training in all but one

area, lower-body strength. Those in the resistance training group experienced greater overall improvements in lower-body strength than did those in the Suspension Training group. This was most likely due to heavier training loads being used in the traditional resistance training group. However, this should not be seen as a negative finding in the support of Suspension Training. Rather, it supports the use of multiple training modalities to elicit specific adaptations.

Garnacho-Castaño and colleagues (2014) found that untrained men who performed a circuit training program that included both a domed training device (BOSU) and a Suspension Trainer (TRX) three days a week for seven weeks experienced significant improvements in maximal strength, average and peak velocity, and average peak power during both the bench press and back squat exercises. Significant improvements were also seen in vertical jump height when performing the squat jump and countermovement jump exercises. Although this is compelling evidence that instability training using a Suspension Trainer can improve these variables during the early stages of a resistance training program, advanced athletes may not experience similar results. Rather, advanced athletes would likely be better served by using Suspension Training as part of a comprehensive strength training program aimed at preventing injury, encouraging core development, and preventing monotony and boredom from stagnant training programs.

Suspension Training can be used to improve strength or endurance, or both. The attribute best developed may depend on initial strength levels. Individuals who already have a great deal of muscle size and strength may not increase their size and strength significantly with Suspension Training because they will not be moving as much weight when then use the Suspension Trainer in comparison to their normal training routines. These individuals may want to emphasize muscular endurance in working with Suspension Training, which they can still gain. For those who aren't very strong, Suspension Training may increase their muscle size, strength, and endurance because they have a higher training ceiling than those who are experienced in strength training. As a general rule of thumb, those who can perform no more than 10 repetitions of a given exercise should emphasize muscle size and strength rather than endurance. In contrast, those who can perform significantly more than 10 repetitions of a particular Suspension Training exercise would be best suited by using that exercise to develop muscular endurance. In order to shift a training program's focus between these attributes, exercise resistance may need to decrease to train endurance and increase to train strength. This can be done easily by selecting different exercises that change the total amount of body weight that must be lifted, by adding external resistance (such as a weighted vest), or by manipulating body position in relation to the anchor point.

Both strength and endurance exercises should be performed as part of a strength training program. Therefore, the current level of strength in a particular exercise or movement often dictates the most appropriate places in which to incorporate Suspension Training exercises into a training program to achieve the best training effect. For example, a suspension squat or lunge would be unlikely to improve overall strength in someone who is very strong on the back squat. However, it could be used to improve mobility by unloading the body while keeping some stress on the legs to prevent detraining, as part of a compound set during a hypertrophy cycle to increase the density of a training session, or to isolate the stabilizer muscles of the hip to reduce the risk of injury or improve neuromuscular control or balance.

Injury Reduction and Rehabilitation

Previous injuries, habitual movement patterns, and repetitive stress may lead to a variety of anatomical constraints. These constraints may decrease the ability to produce efficient movement by creating compensatory movement patterns. When these patterns are performed chronically, neuromuscular inefficiency and tissue breakdown are common. This may lead to pain or increased injury risk.

Core stability, or the effective recruitment of the muscles surrounding the trunk and pelvis, is essential to produce, reduce, stabilize, and transfer forces through the spine, as well as to control the muscles that surround the lower back and pelvis (Mok et al. 2015). Thus, the ability to maintain core stability has a profound effect on injury prevention. Given that training with suspension has been shown to result in improvements and progress in core stability exercises (Byrne et al. 2014; Mok et al. 2015; Snarr and Esco 2014), incorporating this modality into a training program seems intuitive if injury prevention is a concern. Performing a push-up using suspension may also strengthen the rectus abdominis just as effectively as performing abdominal crunches. Because Suspension Training results in less shortening of the psoas, it may be preferred for people with low back pain (Snarr et al. 2013).

Ease and Adjustability

The configuration of the Suspension Trainer allows the user to adjust the working angle to manipulate body angle and either increase or decrease the training load for each exercise. Melrose and Dawes (2015) conducted a study to evaluate the percentages of body mass people using Suspension Training were required to move with their torsos at angles of approximately 30, 45, 60, and 75 degrees and with their feet directly under the anchor point. Not surprisingly, they found that as people leaned back and their torsos became less vertical, resistance increased (37.44 $\pm$ 1.45 percent of body mass at 30 degrees, 52.88 $\pm$ 0.59 percent at 45 degrees, 68.08 $\pm$ 1.95 percent at 60 degrees, and 79.38 $\pm$ 2.14 percent at 75 degrees). Making these small adjustments in body position is significantly easier than changing weights between exercises, which is beneficial in a group training session in which multiple users of varying fitness levels are using the same equipment. In addition, manipulating the base of support (e.g., lifting one leg) can introduce additional balance and stabilization challenges to meet the task-specific demands and current physiological abilities of individual exercisers.

Affordability and Portability

One of the major benefits of Suspension Training is the ability to perform a wide variety of exercises in a small space. This makes it ideal for home gyms and for those who travel frequently. Furthermore, Suspension Training equipment is significantly less expensive than gym memberships. Because the device can be packed and transported easily, Suspension Training is frequently used by military and first responder personnel, especially during deployment.

Suspension Training is unique in its ability to strengthen the intrinsic stabilizing muscles and joint structures. Its benefits include adaptability, portability, and versatility, making it ideal for maintaining muscular strength and endurance anywhere. Integrating Suspension Training into a workout program may also develop accessory muscles, assisting in overall strength development.

Using Suspension Training in a rehabilitation program may also develop the body's core region, lending support to many other structures. Moreover, incorporating it into a daily program requires minimal instruction and supervision by professional staff.

Setup, Safety, and Success

Setting up the Suspension Trainer properly results in effective exercises. The system must also be secured appropriately to avoid injury. As with any exercise program, consultation with a health care provider is recommended, especially for those who have had muscle or joint injuries. Although Suspension Training exercises involve the use of body weight, due to the intensity generated when muscles are under tension for extended periods, as well as the instability of the primary platform, Suspension Training exercises can increase stress on joints and ligaments.

Suspension Trainer Anatomy

A general understanding of the anatomy of the Suspension Trainer is helpful. Figure 3.1 identifies the parts.

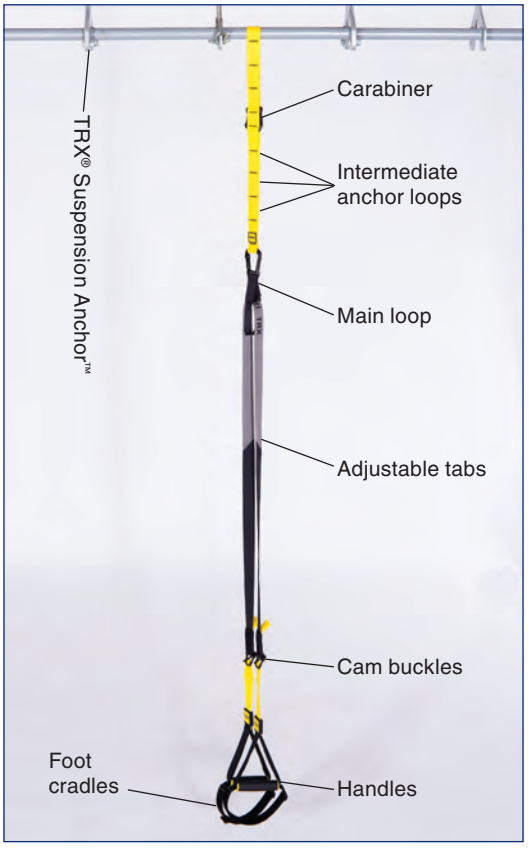

FIGURE 3.1 Parts of a Suspension Trainer.

Anchoring the Suspension Training System

Anchoring the Suspension Trainer requires a sturdy structure that can support the user's weight, such as a beam, bar, or tree limb. The area around it must free of debris to provide enough space to perform the exercises safely. A door can be used as long as the Suspension Trainer has a door anchor attachment.

Hang the Suspension Trainer by wrapping the anchor strap around the structure (see figure 3.2*a*); then, secure it by fastening the carabiner to the appropriate loop (see figure 3.2*b*) so that it hangs straight (see figure 3.2*c*). Be sure to test the weight before using it by pulling firmly on the straps and then gradually shifting weight to the Suspension Trainer.

If using a door, be sure to clip the strap into the loop of the door anchor (see figure 3.3*a*). Place the door anchor over the top of the door (see figure 3.3*b*); then close the door securely (see figure 3.3*c*). Note that the door should open away from the user, allowing the doorjamb to provide extra support during the exercises.

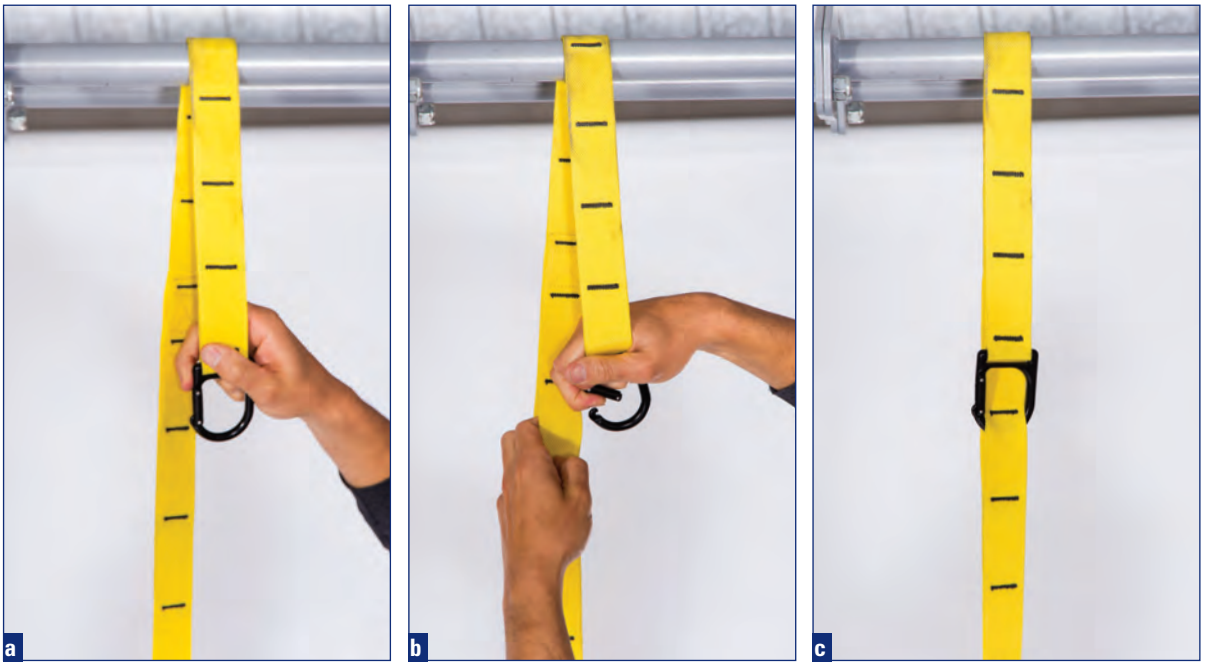

FIGURE 3.2 Anchoring a Suspension Trainer around a beam.

FIGURE 3.3 Anchoring a Suspension Trainer around a door.

Adjusting the Suspension Trainer Length

Adjusting the Suspension Trainer to the appropriate length before each exercise is important to ensure an appropriate training load. The following are typical lengths and positions:

- *Fully shortened*—Adjust the tabs so that they are at the highest point; that is, closest to the anchor (see figure 3.4*a*). This position is primarily used for exercises involving the back, such as row exercises.
- *Mid-length*—Adjust the tabs so that they are approximately at the midpoint of the straps (see figure 3.4*b*). This position is primarily used for exercises involving standing such as the biceps and triceps press.
- *Mid-calf*—Adjust the tabs so that the foot cradles are even with the middle of the user's shin or calf, which is approximately 12 inches (30 cm) off the ground (see figure 3.4*c*). This position is primarily used for exercises involving prone and plank positions.
- *Fully lengthened*—Adjust the tabs so that the bottom of the handles are approximately 3 inches (8 cm) off the ground (see figure 3.4*d*). This position is primarily used for all chest press exercises.

Gripping the Suspension Trainer

There are several ways to grasp the handles during Suspension Training exercises. Some require a specific grip, whereas others use a variety of grips to increase difficulty. The following are the three basic grips:

- *Supinated*—Palms facing up. This grip places a greater demand on the biceps and wrist flexors.
- *Pronated*—Palms facing down. This grip places a greater demand on the rhomboids and wrist extensors.
- *Neutral*—Thumbs facing up or palms facing inward. This grip reduces stress to the shoulder joint and can be used as a modification in any exercise.

Practicing Suspension Training Safely

When using a Suspension Trainer, check and recheck the anchor system prior to use to ensure that it can support weight. Generally, the issue is not related to the system itself (it is designed to support weight); rather, the issue is often related to what the system is anchored to. For instance, when anchoring the Suspension Trainer to a door, a heavy exterior door is much safer than a hollow door usually found between rooms. Use a deadbolt when anchoring to an external door to reduce the risk of the door opening during an exercise. Also, if using the Suspension Trainer in the single-handle configuration, check and recheck the handles to be sure they are secured together prior to use.

The location around the Suspension Trainer should be clear of debris, and the ground should be level and dry. If using the system outside, clear the training

area of any loose debris. Do not use electrical poles for anchor attachment, and ensure that there are no electrical wires near the anchor system.

The following are other important guidelines to follow to ensure safe training:

- Never stand in the handles or foot cradles.
- Do not use the Suspension Trainer as a swing.
- Wipe any sweat off the ground, handles, and foot cradles to avoid slipping.

FIGURE 3.4 Suspension Trainer strap lengths: *(a)* fully-shortened, *(b)* mid-length, *(c)* mid-calf, *(d)* fully lengthened.

- Periodically spray the straps, handles, and foot cradles with an antibacterial spray to reduce the risk of transmitting illnesses or disease (such as MRSA), especially if used in a group setting.
- Be cautious about using hand lotion prior to training because it can increase the risk of slipping off the handles.
- Perform all exercises on resilient flooring with a nonslip surface to reduce the risk of slips and falls and to reduce joint stress.
- Make sure the Suspension Trainer is not rubbing against any skin during use to avoid skin abrasions.
- Wear lightweight and nonrestrictive clothing designed for exercise; other types may restrict or hinder movement.
- Perform exercises in an open area free of debris and sharp objects.
- Avoid exercises that may aggravate current or previous injuries.
- Be familiar with, and practice and master, basic exercises prior to performing more advanced variations.
- Perform Suspension Training exercises with caution if you have major orthopedic limitations or are morbidly obese. Do not perform exercise variations that require greater balance challenges (e.g., single-leg variations), at least in the initial stages of training, if you have these conditions.
- Perform a 5- to 10-minute general warm-up prior to training.

When setting up and using a Suspension Trainer, safety is paramount. Following the general guidelines in this chapter will help ensure safe and effective Suspension Training. However, it is the user's responsibility to be aware of the surroundings and make any appropriate adjustments to maximize safety.

Physical Assessment

Periodic physical assessments help determine whether training adjustments are needed and when to increase exercise intensity. This chapter addresses the nuts and bolts of physical assessment and it provides suggestions for testing exercises when using the Suspension Trainer.

Considerations Before Testing

Before undertaking a physical assessment, people need to be familiar with the exercises they will use in the assessment. Moreover, the assessment itself must be both valid and reliable in order to provide accurate and helpful information. These issues are addressed in greater detail in the following section.

Preparedness

Practicing the exercises before the assessment itself reduces the likelihood of using a less-than-optimal technique during the assessment. A 5- to 10-minute general warm-up prior to testing is also recommended. This general warm-up should include movements that will progressively increase your heart rate, respiration rate, and perspiration rate. Walking or jogging for 3 to 5 minutes followed by some light weight exercises performed on the Suspension Trainer would be an appropriate warm-up. Special attention should be given to make certain that the exercises selected and the intensity of the exercises related to the warm-up do not negatively affect the testing process. If fatigue is accumulated during this portion of the testing process, it may have a negative impact when performing the actual test.

Validity

Validity refers to the ability of a test to accurately measure a specific outcome or attribute. For example, for determining lower-body strength, a test that measures strength in this area, such as the rear-foot elevated split squat, would be ideal. In contrast, to measure upper-body strength, a test such as a push-up or row would be most appropriate. To determine strength gains in the biceps, the biceps curl would be the best option for isolating this area. Test selection is largely based on the targeted attributes. The more specific the selection is, the more helpful the results will be.

Reliability

Reliability refers to the consistency of the results. The following are guidelines for improving the reliability of an assessment:

- Perform all tests indoors in a consistent environment (i.e., temperature, humidity, training surface) to reduce variability.
- Adjust the handles and foot cradles to the same length during every test, and place the feet the same distance from the hanging point. Based on the nature of this training device, these small alterations can create significant changes in the testing load. Failure to be consistent with the setup will not allow accurate comparisons.
- Consider body mass. Significant increases or decreases in weight may alter the results because more or less weight is being moved. This is a particularly misleading factor for those who accrue a large amount of muscle mass. Although they may be significantly stronger, they still must move more mass than in their original test. Therefore, the overall amount of weight moved is greater. This may result in a net zero gain in the number of repetitions performed or in the amount of time holding an isometric position. In reality, improvement has occurred because they are moving or stabilizing a higher load.
- Do not perform tests when significantly fatigued or when experiencing muscle soreness; these conditions can affect results. As a general rule, perform testing 48 to 72 hours after the last exercise session to reduce the effects of soreness and fatigue.
- Reassess every four to six weeks.
- Always give your best effort.

Suggested Testing Exercises

This section presents basic testing exercises for gauging fitness progress. Although any of the exercises in this book can be used as a test, these provide a good general assessment of current fitness level. If you experience pain during any of these exercises, obtain medical clearance prior to beginning a training program.

Elbow Plank

Lie facedown with forearms facing away from the anchor point. Place one foot in each stirrup. From the facedown position, lift the hips and torso until the elbows are directly under the shoulders and the upper arms are perpendicular to the ground using one continuous movement (see figure). Measure this test by tracking the time spent holding the plank position with perfect form and technique. As soon as technique breaks, the test should be terminated. This should be the first test performed in the series. If unable to perform this exercise, substitute the standing plank (see pg. 140).

Suspended Push-Up

Face away from the anchor point and place the feet in the foot cradles. Place the hands on the ground approximately shoulder-width apart. Set the body in a straight line, or plank position. While bracing the trunk and keeping the arms straight, pull the shoulder blades down and together (see figure *a*). Bend at the elbows to lower the body to the ground, keeping the torso flat and rigid, until reaching a 90-degree angle at the elbows (see figure *b*). Push the body back up to the starting position. This test is measured by counting the number of repetitions performed within a set period of time (e.g., one or two minutes), or by counting the number of repetitions performed with good technique or until volitional fatigue. During this test, one may rest in the starting position. If the individual is unable to maintain a proper plank position (i.e., hips drop or rise), the test should be terminated and the number of repetitions to this point should be recorded.

Inverted Row

Face toward the anchor point and grab the handles (one in each hand) using a neutral grip. While keeping the arms completely straight, position your feet directly underneath the anchor point and lean back until the torso is at approximately a 45-degree angle to the ground (see figure *a*). Pull the shoulder blades together and downward. Pull the body toward the anchor point by bending the arms and extending the shoulders (see figure *b*). Slowly extend the arms and allow the shoulders to flex to return to the starting position. This test is measured by counting the number of repetitions performed within a set period of time (e.g., one or two minutes), or by counting the number of repetitions performed with good technique or until volitional fatigue. During the test, one may rest in the starting position. If the individual is unable to maintain a proper plank position (i.e., hips drop or rise), the test should be terminated and the number of repetitions to this point should be recorded.

Reverse Lunge

Face away from the anchor point with the hands on the hips and place one foot in the cradles (see figure *a*). The other foot should be firmly planted on the ground with your weight evenly distributed between your big toe, your little toe, and your heel. While maintaining a rigid torso, allow the lead leg, ankle, knee, and hip to bend until the top of the thigh is parallel to the ground (see figure *b*). Extend the lead leg and bring the back foot forward until back in the starting position. This test is measured by counting the number of repetitions performed within a set period of time (e.g., one or two minutes), or by counting the number of repetitions performed with good technique or until volitional fatigue. During this test, one may rest in the starting position. If the individual is unable to maintain balance, the test should be terminated and the number of repetitions to this point should be recorded. After completing this, place the opposite foot in the stirrups, and then repeat this procedure using the opposite leg.

How to Use the Results

The information gathered from testing can be used in several ways. This section explains how to use this information to determine how effective the training program is and how to adjust it to continue making progress.

Tracking Progress

Figure 4.1 is a blank Suspension Training assessment tracking sheet for measuring fitness progress.

FIGURE 4.1 Suspension Training Assessment Tracking Sheet

	Date: _____	Date: _____	Date: _____
Suspended push-up			
Inverted row			
Reverse lunge (left foot on ground)			
Reverse lunge (right foot on ground)			
Elbow plank			

From J. Dawes, 2017, *Complete guide to TRX® suspension training*™ (Champaign, IL: Human Kinetics).

Measuring Change

One way to gauge fitness progress is to simply look at the amount, or percentage, of change from testing date to testing date. To calculate the amount of change, subtract the value of the previous test from the value of the current test. Take a look at the completed tracking sheet in figure 4.2. If the athlete was able to perform 20 push-ups during the first test, and 12 weeks later was able to perform 30 push-ups, this would be a net change of 10 push-ups. The percentage of change could also be calculated as follows:

1. Subtract the old value from the new value:

   30 push-ups (current test) – 20 push-ups (previous test) = 10 push-ups

2. Divide the amount of change by the old value:

   10 push-ups (amount of change) / 20 push-ups (previous test) = 0.50

3. Convert to a percentage by multiplying the decimal number by 100:

   $0.50 \times 100 = 50\%$ increase

FIGURE 4.2 Suspension Training Assessment Tracking Sheet for Sample Athlete

	Date: September 11	Date: October 10	Date: November 12
Suspended push-up	20	25	30
Inverted row	12	15	18
Reverse lunge (left foot on ground)	10	13	15
Reverse lunge (right foot on ground)	8	11	14
Elbow plank	35 sec	50 sec	75 sec

Improving Symmetry

Asymmetry refers to the differences between the right side and left side of the body when performing certain exercises. The sample athlete's results in figure 4.2 reveal a right versus left asymmetry of 20 percent on the rear-foot suspended reverse lunge in the first test. After approximately 8 weeks of training, this asymmetry decreased to approximately 8 percent difference. Although this is subject to some debate, a bilateral deficit greater than 10 percent may present a risk of injury. As shown, after 12 weeks of training, injury risk was reduced significantly as a result of the athlete's developing greater symmetry between the limbs.

Adjusting the Training Load

Test exercises provide an idea of the current fitness level. Meeting the goals of a training program requires adjusting the resistance by progressing or altering the demands of the exercises to stay in the desired repetition ranges (see table 8.1).

Testing is an important step in the design of a training program. Periodically assessing progress provides the best opportunity to achieve the desired results from a training program.

Suspension Training Exercises

Chapters 5 through 7 present Suspension Training exercises divided into three categories: beginner, intermediate, and advanced. All of the beginner exercises should be mastered before progressing to the intermediate and advanced exercises. Keep in mind that not every variation (e.g., changes in foot position, base of support, or angle of pull) is displayed because the options are limitless. Chapters 1 and 2 describe ways to adjust exercises based on individual constraints and capabilities.

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Upper-Body Exercises

This chapter presents exercises to develop upper-body muscular strength and endurance, flexibility, and mobility. A major benefit of using Suspension Training to perform upper-body exercises is that the intensity can easily be adjusted simply by stepping closer to or farther from the anchor point. Additionally, advanced lifters can safely increase the intensity of many exercises by adding external resistance, such as weight vests.

Standing Push-Up Plus

PURPOSE

To develop the serratus anterior muscles. These muscles help actively stabilize the shoulders at the scapulae. This is an excellent prehabilitation exercise for those involved in overhead throwing sports. It is also great for improving posture for those who spend a lot of time sitting (e.g., have desk jobs). This very subtle movement can reduce the injury and pain associated with poor posture.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Stand facing away from the anchor point and grab a handle with each hand, placing them shoulder-width apart. Set the body in a straight line, or plank position, with the feet hip-width apart.

DESCRIPTION

- Brace the trunk, keep the arms straight, and slowly step backward until there is tension on the straps and the body is at an incline. Simultaneously pull the shoulder blades down and together (see figure *a*).
- Keeping the arms straight, push the shoulder blades apart without rounding the shoulders (see figure *b*).
- Return to the starting position, and repeat for the desired number of repetitions.

TEACHING CUES

- Envision placing the edges of the scapulae in the back hip pockets.
- Brace the trunk as if getting ready to take a punch to the abdomen.

Chest Press

PURPOSE

To develop upper-body muscular endurance in the chest, shoulders, and triceps, as well as trunk and shoulder strength and stability.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Face away from the anchor point, and grab a handle with each hand. Extend the arms and position the hands shoulder-width apart. Place the feet hip- to shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and slowly step backward until there is tension on the straps and the body is at an incline (see figure *a*).
- Bend the arms and lower the chest between the handles, similar to performing a push-up (see figure *b*).
- Extend the arms to return to the starting position.

TEACHING CUES

- Brace the trunk as if getting ready to take a punch to the abdomen.
- Keep the torso as stiff as a board from the head to the heels.
- Lower the body toward the handles in a slow, controlled manner.
- If you are unable to achieve a full range of motion, perform the exercise through a partial range of motion until the requisite strength and stability are developed.


a


b

Standing Overhead Triceps Extension

PURPOSE
To isolate and develop the triceps and develop isometric trunk strength and stability. Using the Suspension Trainer results in greater total-body development than using traditional barbell and dumbbell versions of this exercise.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing away from the anchor point. Grab a handle with each hand, and lean forward so the torso is at an angle of at least 45 degrees to the ground.

DESCRIPTION

- Bend the elbows to 90 degrees. At this point, the hands should be at the forehead height (see figure *a*).
- While keeping the balls of the feet in contact with the ground and the trunk rigid, extend the arms down in front of the body (see figure *b*).
- Bend the elbows and return to the starting position.

TEACHING CUES

- Maintain a rigid torso throughout the exercise.
- Move only at the elbows.


a


b

Single-Leg Chest Press

PURPOSE

To enhance muscular endurance of the upper-body pushing muscles, and to train trunk antirotation and stability.

PREREQUISITES

The ability to balance on a single leg and maintain a plank position.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Face away from the anchor point, and grab a handle with each hand. Extend the arms and position the hands shoulder-width apart. Set the body in a straight line, or in plank position, with the feet close together.

DESCRIPTION

- Brace the trunk and slowly step backward until there is tension on the straps and the body is at an incline.
- While stabilizing the trunk, lift one foot 6 to 12 inches (15 to 30 cm) off the ground (see figure *a*).
- Bend the arms and lower the chest between the handles, similar to performing a push-up (see figure *b*).
- Extend the arms to return to the starting position.

TEACHING CUES

- Brace the trunk as if ready to take a punch to the abdomen.
- Keep the torso as stiff as a board from the head to the heels.
- Lower the body toward the handles in a slow, controlled manner.
- If unable to achieve a full range of motion, perform through a partial range of motion until the requisite strength and stability are developed.

Push-Up Plus

PURPOSE

To develop the serratus anterior muscles. These muscles help actively stabilize the shoulders at the scapulae. This exercise is a more advanced progression of the standing push-up plus. This variation requires the ability to stabilize a larger portion of the overall body mass.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Place the feet in the stirrups, and then roll over onto the abdomen. Place the hands shoulder-width apart on the ground. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Keeping the arms straight, push the shoulder blades apart without rounding the shoulders (see figure *b*).
- Return to the starting position, and repeat for the desired number of repetitions.

TEACHING CUES

- Envision placing the edges of the scapulae in the back hip pockets.
- Push the shoulder blades up to the ceiling.
- Brace the trunk as if ready to take a punch to the abdomen.

Prone Iron Cross

PURPOSE
To develop shoulder and core strength and stability.

PREREQUISITES
The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Grab a handle with each hand, and face away from the anchor point. Position the hands against the torso, just below the underarms. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and slowly step backward until there is tension on the straps and the body is at an incline (see figure *a*).
- Slowly extend the arms, pushing them out to the sides, similar to a T position (see figure *b*).
- Return the arms to the starting position against the torso.

VARIATION
Instead of extending the arms simultaneously, extend one arm, maintain the posture, and then extend the other arm, moving in a unilateral fashion.

TEACHING CUES

- Brace the trunk as if ready to take a punch to the abdomen.
- Keep the torso as stiff as a board from the head to the heels.

Sprinter Chest Press

PURPOSE

To develop upper-body muscular endurance in the chest, shoulders, and triceps. Additionally, this drill helps develop stability in the hip of the stance leg, as well as hip mobility on the drive-leg side. The ability to stabilize the lower body in these positions is essential during acceleration in sports.

PREREQUISITES

The ability to balance on a single leg and maintain a plank position.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Face away from the anchor point, and grab a handle with each hand. Extend the arms and position the hands shoulder width-apart. Position the feet hip- to shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and slowly step backward until there is tension on the straps and the body is at an incline (see figure *a*).
- Bend the arms and lower the chest between the handles, similar to performing a push-up (see figure *b*).
- Extend the arms and, keeping the left leg straight, drive the right knee forward while keeping the right ankle in a dorsiflexed position. At the peak of the knee drive, extend the ankle of the left leg (see figure *c*).
- Return the right foot to the starting position.
- Repeat using the left leg as the drive leg and the right leg as the stance leg.

TEACHING CUES

- Toe up, knee up on the drive leg.
- Stay stiff as a board from the head through the heels.


a


b


c

Suspended Push-Up

PURPOSE
To develop muscular endurance and stability of the chest, shoulders, and triceps.

PREREQUISITES
The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION
- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Bend at the elbows to lower the body to the ground, keeping the torso flat and rigid, until attaining at least a 90-degree angle at the elbows (see figure *b*).
- Push back up to the starting position.

TEACHING CUES
- Envision placing the edges of the scapulae in the back hip pockets.
- Stay stiff as a board from the head through the heels.
- Slightly tuck the chin.

Push-Up With Reverse Crunch

PURPOSE

To develop muscular endurance and stability of the chest, shoulders, triceps, and rectus abdominis.

PREREQUISITES

The ability to maintain a plank position, and no shoulder or back pain while performing the exercise.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Bend at the elbows to lower the body to the ground (see figure *b*).
- Extend the arms and push the body back to the starting position, and drive the knees toward the chest (see figure *c*).
- Return to the starting position.

TEACHING CUES

- Maintain a plank position.
- Stay stiff as a board from the head to heels.
- Drive the knees to the chest.


a


b


c

Chest Fly

PURPOSE

This isolation exercise develops the pectoralis major, which is responsible for horizontal adduction of the arms.

PREREQUISITES

The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Face away from the anchor point, and grab a handle with each hand. Place the feet hip- to shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight.
- Internally rotate the shoulders so the elbows point out to the sides (see figure *a*).
- Keeping the arms locked in this position, slowly push the hands away from each other while pulling the shoulder blades down and together.
- Attempt to move the hands outward until they are almost directly aligned with the torso, or until a large stretch is felt in the chest (see figure *b*).
- In this position, bring the hands back to the starting position.

TEACHING CUES

- When returning to the starting position, act as if wrapping the hands around a tree trunk.
- Maintain a rigid torso throughout the exercise.

Kneeling Skull Crusher

PURPOSE

To isolate and develop the triceps and develop isometric trunk stability. Using the Suspension Trainer for this exercise results in greater total-body development than traditional barbell and dumbbell versions of this exercise.

PREREQUISITE

The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Begin with both knees on the ground facing away from the anchor point. Grab a handle in each hand, and lean forward so the torso is at an angle of at least 45 degrees to the ground.

DESCRIPTION

- Position the upper arms perpendicular to the torso, and bend the elbows to 90 degrees. At this point, the hands should be at forehead height (see figure *a*).
- While keeping the lower leg and knees in contact with the ground, and the trunk rigid, extend the elbows (see figure *b*).
- Slowly allow the elbows to bend to return to the starting position.

TEACHING CUES

- Maintain a rigid torso throughout the exercise.
- Move only at the elbows.


a


b

Kneeling Overhead Triceps Extension

PURPOSE

To isolate and develop the triceps and develop isometric trunk stability. The Suspension Trainer results in greater total-body development than traditional barbell and dumbbell versions of this exercise.

PREREQUISITE

The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Begin by kneeling and facing away from the anchor point. Grab a handle with each hand, and lean forward so the torso is at an angle of at least 45 degrees to the ground.

DESCRIPTION

- Extend the arms overhead with the upper arms beside the ears (see figure *a*).
- Bend the elbows to 90 degrees. At this point, the hands should be behind the head with a neutral grip (see figure *b*).
- While keeping the lower legs and knees in contact with the ground, and the trunk rigid, extend the elbows to return to the starting position.

TEACHING CUES

- Maintain a rigid torso throughout the exercise.
- Move only at the elbows.


a


b

Clock Press

PURPOSE
To develop shoulder and trunk stability.

PREREQUISITES
The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Grab a handle with each hand, and face away from the anchor point with the feet hip- to shoulder-width apart. Position the hands against the torso just below the underarms. Set the body in a straight line, or in plank position.

DESCRIPTION
- Brace the trunk and step backward slowly until there is tension on the straps and the body is at an incline (see figure *a*).
- Slowly extend the arms, pushing them out to the sides, similar to a T position.
- Return the arms to the starting position against the torso; then, repeat this movement while pressing the left hand to the 2 o'clock position and the right hand to the 8 o'clock position (see figure *b*).
- Return the arms to the starting position against the torso; then, repeat this movement pressing the left hand to the 4 o'clock position and the right hand to the 10 o'clock position.
- Return to the starting position, and repeat this series three or four times.

TEACHING CUES
- Brace the trunk as if ready to take a punch to the abdomen.
- Keep the torso as stiff as a board from the head to the heels.
- If unable to fully extend the arms, use a partial range of motion until the requisite strength and stability are developed.


a


b

Off-Center Chest Press

PURPOSE
To develop upper-body muscular endurance in the chest, shoulders, and triceps, as well as trunk, hip, and shoulder stability during weight shifts.

PREREQUISITES
The ability to balance on a single leg and maintain a plank position.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and grab a handle with each hand. Extend the arms and position the hands shoulder-width apart. Set the body in a straight line, or in plank position, with the feet hip-width apart.

DESCRIPTION

- Brace the trunk and slowly step backward until there is tension on the straps and the body is at an incline.
- While stabilizing the trunk, lift the left foot 6 to 12 inches (15 to 30 cm) off the ground and position it at 7 or 8 o'clock (see figure *a*).
- Bend the arms and lower the chest between the handles, similar to performing a push-up (see figure *b*).
- Extend the arms to return to the starting position.
- After performing the desired number of repetitions, lift the right foot out to 4 or 5 o'clock and repeat the exercise.

TEACHING CUE
Perform the same number of repetitions on the right and left legs.


a


b

Single-Arm Chest Press

PURPOSE
To enhance muscular endurance of the chest, shoulders, and triceps while resisting trunk rotation.

PREREQUISITES
The ability to maintain a plank position and resist hip and torso rotation.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Face away from the anchor point, grab the handles with one hand, and extend the arm. Place the other hand on the hip or hold it in the same position as if performing the exercise. Set the body in a straight line, or in plank position, and position the feet in an offset stance (easier) or a shoulder-width stance (harder).

DESCRIPTION

- Brace the trunk and slowly step backward until there is tension on the straps and the body is at an incline (see figure *a*).
- Bend the working arm and lower the chest between the handles, similar to performing a push-up (see figure *b*).
- Extend the working arm to return to the starting position.

TEACHING CUES

- Stay stiff as a board from the head through the heels.
- In the offset stance, push the body into the handles to increase the stability of the movement and the training load. Note: The load can also be increased in this exercise by assuming a tandem stance and shifting more of one's body weight into the strap.


a


b

Incline Push-Up

PURPOSE

To develop muscular strength and endurance and stability of the chest, shoulders, and triceps.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Face away from the anchor point, and place one foot in both foot cradles. Position the hands on the ground shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together.
- Raise the support leg off the ground and position it parallel to the foot in the foot cradles (see figure *a*).
- Bend at the elbows to lower the body to the ground, keeping the torso flat and rigid (see figure *b*).
- Push back to the starting position.

TEACHING CUES

- Envision placing the edges of the scapulae in the back hip pockets.
- Do not perform with both feet in separate stirrups; doing so makes achieving the proper body position more difficult and may increase injury risk. Note: Be sure to switch legs in order to make certain that isometric strength and muscular symmetry are developed uniformly on both sides.

Inverted Shoulder Press

PURPOSE
To develop strength, stability, and muscular endurance in the shoulders.

PREREQUISITES
No preexisting shoulder pain or injuries, and sufficient strength and mobility to perform a pike.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place one foot in both foot cradles. The hands are on the ground shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight.
- Bend the hips until the torso is nearly vertical (see figure *a*).
- Bend at the elbows to lower the head to the ground until attaining a 90-degree angle at the elbows (see figure *b*).
- Push back to the starting position.

TEACHING CUES

- Use a partial range of motion for this exercise until the strength and stability in the trunk and shoulders are sufficient to achieve a 90-degree angle at the elbows.
- Maintain a stiff torso. Note: Be sure to switch legs in order to make certain that isometric strength and muscular symmetry are developed uniformly on both sides.


a


b

Push-Up With Oblique Crunch

PURPOSE
To develop muscular endurance and stability of the chest, shoulders, and triceps, and improve thoracic mobility.

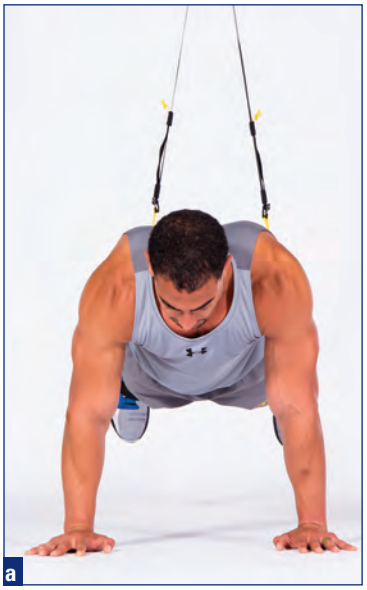
PREREQUISITES
The ability to maintain a plank position, and no shoulder or back pain while performing the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart. Set the body in a straight line, or in plank position, with the feet hip- to shoulder-width apart.

DESCRIPTION
- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Bend at the elbows to lower the body to the ground (see figure *b*).
- Extend the arms and push back to the starting position while rotating the hips (see figure *c*).

TEACHING CUES
- Stay stiff as a board from the head through the heels.
- Slightly tuck the chin.
- Try to use as little momentum as possible to execute the movement.


a


b


c

Drop Push-Up

PURPOSE

This exercise accentuates eccentric loading of the chest, shoulders, and triceps. It can be used to teach proper landing technique prior to performing explosive, plyo, or depth drop plyo push-ups.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, no shoulder or back pain while performing the exercise, and the ability to bench press 1.5 times body weight.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Face away from the anchor point, and place the feet in the stirrups. Position the hands on the ground shoulder-width apart with the elbows lower than the shoulders. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Jump the hands to the sides slightly wider than shoulder width (see figure *b*), bending the elbows to absorb the landing (see figure *c*).
- Push back up to the starting position.

TEACHING CUES

- Absorb the landing softly, and land as quietly as possible.
- Maintain a rigid torso throughout the exercise.

Single-Leg Chest Fly

PURPOSE

This isolation exercise develops the pectoralis major, which is responsible for horizontal adduction of the arms, and challenges balance and stability on the stance leg.

PREREQUISITES

The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Face away from the anchor point, and grab a handle with each hand. Place the feet hip- to shoulder width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight.
- Internally rotate the shoulders so the elbows point out to the sides, and lift one foot 6 inches (15 cm) off the ground (see figure *a*).
- While keeping the arms locked in this position, slowly push the hands away from each other while pulling the shoulder blades down and together.
- Attempt to move the hands outward until they are almost directly aligned with the torso, or until a large stretch is felt in the chest (see figure *b*).
- In this position, bring the hands back to the starting position.

TEACHING CUES

- When returning to the starting position, act as though wrapping the hands around a tree trunk.
- Maintain a rigid torso throughout the exercise.

Explosive Push-Up

PURPOSE

To develop power in the upper body. This exercise minimizes the effects of the stretch–shortening cycle and focuses on concentric force production. This variation of the traditional explosive push-up (in which the feet are on the ground) increases the load.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, no shoulder or back pain while performing the exercise, and the ability to bench press 1.5 times body weight.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Face away from the anchor point, and place the feet in the stirrups. Position the hands on the ground shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Bend at the elbows to lower the body to the ground, while keeping the torso flat and rigid, until creating a 90-degree angle at the elbows (see figure *b*).
- Hold this position for one or two seconds; then, push off the ground as rapidly as possible so the hands lose contract with the ground (see figure *c*).
- Upon landing, bend the elbows and extend the shoulders slightly to absorb the landing (see figure *d*).

TEACHING CUES

- Absorb the landing softly, and land as quietly as possible.
- Maintain a rigid torso throughout the exercise.


a


b


c


d

Plyo Push-Up

PURPOSE

To develop power in the upper body. This exercise maximizes the effects of the stretch–shortening cycle and focuses on the use of stored elastic energy within the muscle tissue and tendons to produce explosive force and power. This variation of the traditional plyo push-up (in which the feet are on the ground) increases the load.

PREREQUISITES

The ability to maintain a plank position throughout the exercise, no shoulder or back pain while performing the exercise, and the ability to bench press 1.5 times body weight.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Face away from the anchor point, and place the feet in the stirrups. Position the hands on the ground shoulder-width apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight while pulling the shoulder blades down and together (see figure *a*).
- Rapidly bend at the elbows to lower the body to the ground, while keeping the torso flat and rigid (see figure *b*).
- Once a 90-degree angle at the elbows is attained, immediately push off the ground as fast as possible so the hands lose contract with the ground (see figure *c*). Note: It is not necessary to clap the hands when performing this exercise.
- Upon landing, bend the elbows and extend the shoulders slightly to absorb the landing (see figure *d*).

TEACHING CUES

- Absorb the landing softly, and land as quietly as possible.
- Maintain a rigid torso throughout the exercise.


a


b


c


d

Single-Arm Chest Fly

PURPOSE

This isolation exercise develops the pectoralis major, which is responsible for horizontal adduction of the arms.

PREREQUISITES

The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT

Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION

Stand sideways and assume an offset stance. Grab the handles with the hand that is closer to the anchor point, and place the other hand on the hip. Set the body in a straight line, or in a side plank position.

DESCRIPTION

- Brace the trunk and keep the arm straight.
- Internally rotate the shoulder of the working arm so the elbow points out to the side (see figure *a*).
- While keeping the arm locked in this position, slowly push the hand against the handle, or away from the anchor point.
- Attempt to move the hand inward until it is almost directly aligned with the torso, or until a large stretch is felt in the chest (see figure *b*).
- Bring the hand back to the starting position.

TEACHING CUES

- Maintain a slight bend in the elbow throughout so as not to hyperextend this joint.
- Keep the hips stacked under the shoulders, and do not let them drop while lowering to the starting position.

Standing Skull Crusher

PURPOSE

To isolate and develop the triceps and develop isometric trunk stability. The Suspension Trainer results in greater total-body development than traditional barbell and dumbbell versions of this exercise.

PREREQUISITE

The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION

Begin by facing away from the anchor point. Grab a handle in each hand, and lean forward so the torso is at an angle of at least 45 degrees to the ground.

DESCRIPTION

- Position the upper arms perpendicular to the torso, and bend the elbows to 90 degrees. At this point, the hands should be at forehead height (see figure *a*).
- While keeping the feet in contact with the ground, and the trunk rigid, extend the elbows (see figure *b*).
- Slowly bend the elbows to return to the starting position.

TEACHING CUES

- Maintain a rigid torso throughout the exercise (i.e., stiff as a board from the head to the heels).
- For an advanced version of the exercise, move only at the elbows.


a


b

Scapular Retraction

PURPOSE
To develop strength in the rhomboids and upper and lower trapezius muscles, which surround the scapulae.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab a handle with each hand. Position the feet about hip- to shoulder-width apart, and lean back until the torso is at a 45-degree angle to the ground (see figure *a*).

DESCRIPTION

- Pull the shoulder blades together and downward (see figure *b*).
- Without shrugging the shoulders, slowly allow the shoulder blades to separate and return to the starting position.

TEACHING CUES

- Envision placing the edges of the scapulae in the back hip pockets.
- Brace the core.

Inverted Row

PURPOSE
To develop the muscles of the back.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral, overhand, or supinated grip. Lean back until the torso is at a 45-degree angle to the ground.

DESCRIPTION
- Pull the shoulder blades together and downward (see figure *a*).
- Pull the body toward the anchor point by bending the arms and extending the shoulders (see figure *b*).
- Slowly extend the arms and allow the shoulders to flex to return to the starting position.

TEACHING CUES
- Maintain a braced core throughout the exercise, and squeeze the glutes.
- Pull the straps to the chest.

Rear Deltoid Row

PURPOSE
To develop the muscles of the upper back and shoulders.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

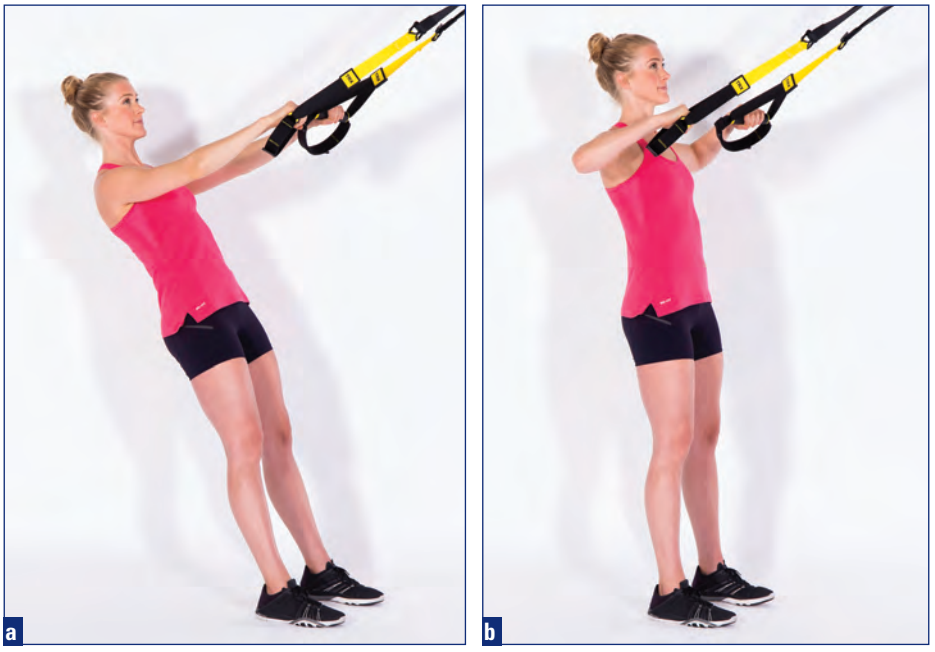
STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral, overhand, or supinated grip. Position the feet hip- to shoulder-width apart. While keeping the arms completely straight, lean back until the torso is at a 45-degree angle to the ground while pulling the shoulder blades together and downward (see figure *a*).

DESCRIPTION

- While keeping the elbows in line with the center of the breastbone, pull the body toward the anchor point by bending the arms and pulling the handles toward the underarms. At this point the hands and the elbows should be in line with one another (see figure *b*).
- Slowly extend the arms and allow the shoulders to flex to return to the starting position.

TEACHING CUES

- Do not lift the elbows above the shoulders.
- Keep the core braced and squeeze the glutes.



Biceps Curl

PURPOSE
To develop the biceps.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using an underhand or supinated grip. Position the feet hip- to shoulder-width apart. Keeping the arms completely straight, lean back until the torso is at a 45-degree angle to the ground (see figure *a*).

DESCRIPTION
- Pull the shoulder blades together and downward, bend the elbows, and bring the hands toward the face (see figure *b*).
- Extend the elbows and return to the starting position.

TEACHING CUES
- Move only at the elbows.
- Brace the trunk and squeeze the glutes.


a


b

Wrist Flexion

PURPOSE
To develop the wrist flexors.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using an underhand or supinated grip. Position the feet hip- to shoulder width apart. Keep the arms completely straight while leaning back until the torso is at a 45-degree angle to the ground (see figure *a*).

DESCRIPTION
- Pull the shoulder blades together and downward; then, bend the wrists toward the body (see figure *b*).
- Extend the wrists and return to the starting position.

TEACHING CUES
- Move only at the wrists.
- Brace the trunk and squeeze the glutes.


a


b

Dual-Arm External Rotation

PURPOSE
To strengthen the rotator cuff and develop the deltoids.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral grip. Stagger the feet. Bend the elbows at 90 degrees, and hold them and the upper arms against the body (see figure *a*).

DESCRIPTION

- While keeping the body rigid and elbows bent, externally rotate at the shoulders by pushing the hands away from the body (see figure *b*).
- Return to the starting position, and perform the desired number of repetitions.

TEACHING CUES

- Keep the elbows locked in to the torso.
- Brace the core.

Field Goal

PURPOSE
To strengthen the upper back, deltoids, and the rotator cuff muscles.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral, overhand, or supinated grip. Position the feet hip- to shoulder-width apart. Keep the arms bent at 90 degrees while leaning back until the torso is at a 45-degree angle to the ground and pulling the shoulder blades together and downward (see figure *a*).

DESCRIPTION
- Keep the elbows in line with the center of the breastbone, and pull the handles toward the ears, using only the shoulders to rotate them up (see figure *b*). At this point, the hands and the elbows should be in line with the ears.
- Slowly lower the arms to the starting position.

TEACHING CUES
- Rotate only at the shoulders.
- Brace the core.


a


b

Supine Iron Cross

PURPOSE
To develop the muscles of the rear deltoids, as well as trunk stability.

PREREQUISITES
The ability to maintain a plank position throughout the exercise, and no shoulder or back pain while performing the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face toward the anchor point, and grab a handle with each hand. Position the hands against the torso just below the underarms. The feet should be hip- to shoulder width-apart. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and slowly step forward until there is tension on the straps and the body is at an incline (see figure *a*).
- Slowly extend the arms, pushing them out to the sides, similar to a T position (see figure *b*).
- Return to the starting position.

TEACHING CUES

- Push the hands straight out to the sides.
- Squeeze the shoulder blades together, and put them in the back hip pockets.


a


b

Low Row

PURPOSE
To develop the muscles of the back.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab a handle in each hand using a neutral, overhand, or supinated grip. Position the feet hip- to shoulder-width apart. While keeping the arms completely straight, slowly bend the knees and lean back until the torso is parallel to the ground and the knees are bent at a 90-degree angle.

DESCRIPTION

- Pull the shoulder blades together and downward (see figure *a*).
- Pull the body toward the anchor point by bending the arms and extending the shoulders while allowing the knees to extend to 110 to 120 degrees at the apex of the pull (see figure *b*).
- Extend the arms and allow the shoulders to flex to return to the starting position.
- The intensity of this exercise can be increased by slowly lowering the body back to the starting position (i.e., a 1:3; 1:4 count).


a


b

TEACHING CUES

- Maintain a braced core throughout the exercise, and squeeze the glutes.
- Pull the straps to the chest.

Rear Deltoid Row to Y

PURPOSE
To strengthen the rhomboids, upper and lower trapezius, and rotator cuff muscles.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral, overhand, or supinated grip. Assume a staggered stance (or place the feet hip-width apart for more of a challenge). Lean back until the torso is at a 45-degree angle to the ground while pulling the shoulder blades together and downward and keeping the arms completely straight (see figure *a*).

DESCRIPTION

- Perform a rear deltoid row as previously described on page 64. At this point, the hands and the elbows should be in line with one another (see figure *b*).
- Move the arms outward, rotate the shoulders, and extend the arms to form a Y (see figure *c*).
- Now, slowly lower the arms back to the T position; then, extend them and return to the starting position.

TEACHING CUES

- Do not lift the elbows above the shoulders during the rear deltoid row portion of the exercise.
- Brace the core.


a


b


c

I, Y, T

PURPOSE
To strengthen the rhomboids, upper and lower trapezius, and rotator cuff muscles.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand. Assume a staggered stance. Lean back until the torso is at a 45-degree angle to the ground while pulling the shoulder blades together and downward and keeping the arms completely straight (see figure *a*).

DESCRIPTION

- Moving only at the shoulders, rotate the arms and position them directly overhead to form an I (see figure *b*), at a 45-degree angle over the head to form a Y (see figure *c*), and finally directly out to the sides to form a T (see figure *d*).
- Return to the starting position prior to performing each movement.

TEACHING CUES

- Maintain a stiff torso.
- Pause at the top of each movement for one second before returning to the starting position.


a
b
c
d

T Fly

PURPOSE
To strengthen the rhomboids, upper and lower trapezius, and rotator cuff muscles.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral grip. Position the feet hip- to shoulder-width apart. Keep the arms slightly bent. Lean back until the torso is at a 45-degree angle to the ground while pulling the shoulder blades together and downward (see figure *a*).

DESCRIPTION
- Maintain a slight bend in the elbow, and internally rotate the shoulders so the elbows point out to the sides.
- While keeping the arms locked in this position, slowly push the hands away from each other while pulling the shoulder blades down and together.
- Attempt to move the hands outward until they are almost directly aligned with the torso (see figure *b*).
- Bring the hands back to the starting position.

TEACHING CUES
- Keep the elbows slightly bent throughout the exercise, and lock them in this position.
- Brace the core.
- Do not shrug the shoulders during the movement.


a


b

Reverse Biceps Curl

PURPOSE
To develop the biceps and wrist extensors.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using an overhand or pronated grip. Position the feet hip- to shoulder-width apart. While keeping the arms completely straight, lean back until the torso is at a 45-degree angle to the ground (see figure *a*).

DESCRIPTION
- Pull the shoulder blades together and downward, bend the elbows, and bring the hands toward the face (see figure *b*).
- Extend the elbows and return to the starting position.

TEACHING CUES
- Move only at the elbows.
- Brace the trunk and squeeze the glutes.

Dual-Arm Internal Rotation

PURPOSE
To strengthen the rotator cuff muscles, deltoids, and pectoralis major.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral grip. Position the feet hip- to shoulder-width apart, and lean back until the torso is at a 45-degree angle to the ground. Bend the elbows at 90 degrees, and hold them and the upper arms against the body (see figure *a*).

DESCRIPTION
- While keeping the body rigid, bend the elbows and internally rotate at the shoulders by pulling the hands toward the opposite elbows (see figure *b*).
- With each repetition, switch the arm that is on top.

TEACHING CUES
- Keep the elbows locked in to the torso.
- Brace the core.


a


b

Single-Arm Inverted Row

PURPOSE
To develop the muscles of the back.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab both handles with one hand using a neutral, overhand, or supinated grip. Place the opposite hand on the hip or at the side. Position the feet hip- to shoulder-width apart. While keeping the working arm completely straight, lean back until the torso is at a 45-degree angle (or more if too difficult) to the ground (see figure *a*).

DESCRIPTION
- Pull the body toward the anchor point by bending the elbow and extending the shoulder of the working arm (see figure *b*).
- Slowly extend the working arm and allow the shoulder to flex to return to the starting position.

TEACHING CUES
- Do not allow the hips or torso to rotate.
- Pull the straps to the chest.

Split Fly

PURPOSE
To strengthen the rhomboids, upper and lower trapezius, and rotator cuff muscles.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, and grab a handle with each hand using a neutral grip. Position the feet hip- to shoulder-width apart. While keeping the arms slightly bent, lean back until the torso is at a 45-degree angle to the ground while pulling the shoulder blades together and downward (see figure *a*).

DESCRIPTION
- Maintain a slight bend in the elbow; while keeping the arms locked in this position, slowly push the hands away from each other while pulling the shoulder blades down and together.
- Attempt to move the hands outward until they are almost directly aligned with the torso (i.e., 3 o'clock and 9 o'clock positions) (see figure *b*).
- Now, bring the hands back to the starting position.
- Repeat this action by moving the hands in the following combinations:
  - Right hand to the 1 o'clock position, and left hand to the 7 o'clock position.
  - Right hand to the 5 o'clock position, and left hand to the 10 o'clock position.

TEACHING CUES
- Keep the elbows slightly bent throughout the exercise, and lock them in this position.
- Brace the core.
- Do not shrug the shoulders during the movement.

Single-Arm Biceps Curl

PURPOSE
To develop the biceps.

PREREQUISITE
The ability to maintain a rigid torso throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

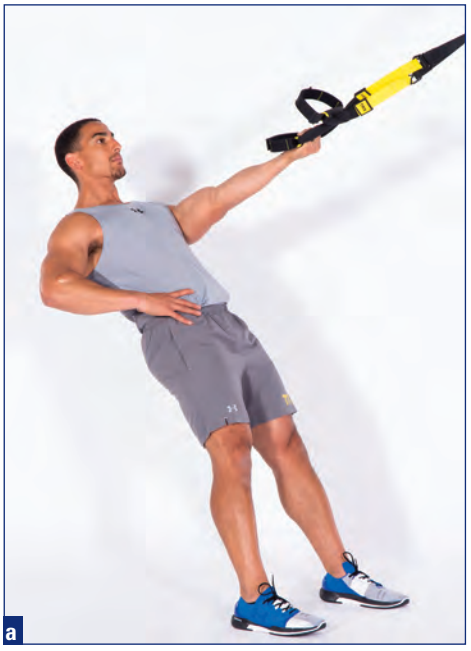
STARTING POSITION
Put the straps into the single-handle mode. Face the anchor point, and grab the handle with one hand using an underhand grip. Position the feet hip- to shoulder-width apart. While keeping the arm completely straight, lean back until the torso is at a 45-degree angle to the ground (see figure *a*).

DESCRIPTION

- Pull the shoulder blades together and downward, bend the elbow, and bring the hand toward the face (see figure *b*).
- Extend the elbow and return to the starting position.

TEACHING CUES

- Move only at the elbow.
- Brace the trunk and squeeze the glutes.
- Do not allow the trunk or hips to rotate.



Single-Arm Reverse Biceps Curl

PURPOSE
To develop the biceps and wrist extensors.

PREREQUISITE
The ability to maintain a rigid torso (plank position) throughout the exercise.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Put the straps into the single-handle mode. Face the anchor point, and grab the handle with one hand using an overhand grip. Position the feet hip- to shoulder width apart. While keeping the arm completely straight, lean back until the torso is at a 45-degree angle to the ground (see figure *a*).

DESCRIPTION

- Pull the shoulder blades together and downward, bend the arm at the elbow, and bring the hand toward the face (see figure *b*).
- Extend the elbow and return to the starting position.

TEACHING CUES

- Move only at the elbow.
- Brace the trunk and squeeze the glutes.
- Do not allow the trunk or hips to rotate.


a


b

Pec Stretch

PURPOSE
To improve pectoral muscle flexibility and shoulder joint mobility.

PREREQUISITES
The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face away from the anchor point, and grab a handle with each hand. Assume a staggered stance. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk, slightly bend the elbows, and extend the arms out to the sides.
- While keeping the arms locked in this position, slowly push the hands away from each other and pull the shoulder blades down and together.
- Lean forward and move the hands outward until a large stretch is felt in the chest (see figure).
- Bring the hands back to the starting position.

TEACHING CUES

- Stretch to the point of mild tension.
- Do not stretch to the point of pain.

Single-Arm Pec Stretch

PURPOSE
To improve pectoral muscle flexibility and shoulder joint mobility.

PREREQUISITES
The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face sideways and grab the handles with the hand that is closer to the anchor point. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk with the working arm straight and the non-working arm to the side of the body or on the hip.
- Rotate the hips while repositioning the feet to the 6 o'clock position, or until a large stretch is felt in the chest (see figure).
- Hold this position for 10 to 30 seconds; then, repeat on the other side.

TEACHING CUES

- Stretch to the point of mild tension.
- Do not stretch to the point of pain.

Single-Arm Kneeling Pec Stretch

PURPOSE
To improve pectoral muscle flexibility and shoulder joint mobility.

PREREQUISITES
The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

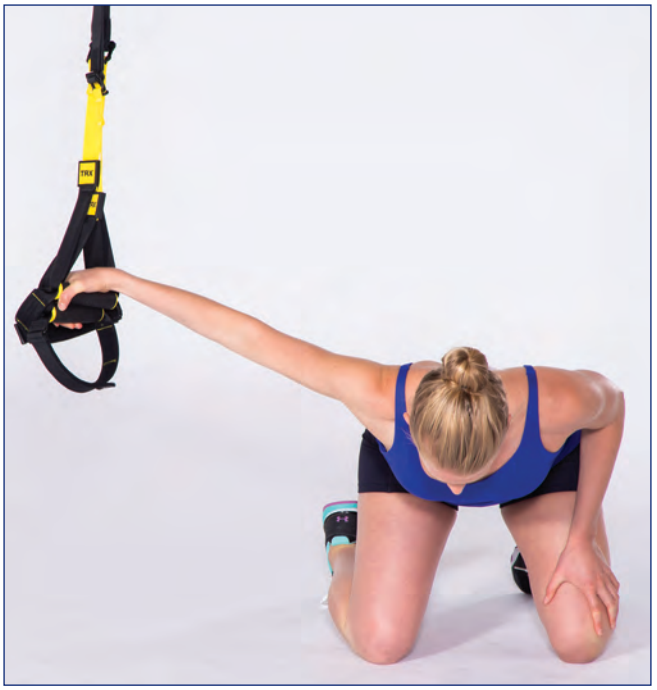
STARTING POSITION
In a kneeling position, face sideways, extend the arm that is closer to the anchor point, and grab both handles.

DESCRIPTION

- Brace the trunk with the working arm straight and the non-working arm to the side of the body or on the hip.
- Lean forward and rotate the torso away from the extended arm while pushing the hand downward (see figure).
- Hold this position for 10 to 30 seconds; then, repeat on the other side.

TEACHING CUES

- Stretch to the point of mild tension.
- Do not stretch to the point of pain.



Overhead Lat Stretch

PURPOSE
To improve latissimus dorsi flexibility and shoulder joint mobility.

PREREQUISITES
The ability to maintain a rigid torso throughout the exercise, and no shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face away from the anchor point (or stand sideways to stretch the obliques), and grab a handle with each hand. Assume a staggered stance. Set the body in a straight line, or in plank position.

DESCRIPTION

- Brace the trunk and keep the arms straight.
- Lunge forward until the hands are behind the head, and lean away from the anchor point until a stretch is felt through the latissimus dorsi (see figure).
- Hold this position for 10 to 30 seconds.

TEACHING CUES

- Stretch to the point of mild tension.
- Do not stretch to the point of pain.

Rear Deltoid Stretch

PURPOSE
To improve shoulder joint flexibility and mobility.

PREREQUISITE
No shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand sideways and hold both straps in the hand that is farther from the anchor point.

DESCRIPTION

- Step laterally, away from the anchor point, until the strap is taught.
- While keeping the arm extended at chest height, lean away from the anchor point until a stretch is felt through the back of the shoulder (see figure).
- Hold this position for 10 to 30 seconds; then, repeat on the opposite side.

TEACHING CUES

- For a greater stretch, step farther from the anchor point.
- Stretch to the point of mild tension.
- Do not stretch to the point of pain.

Bent-Over Rear Deltoid Stretch

PURPOSE
To improve shoulder joint flexibility and mobility.

PREREQUISITE
No shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand sideways and hold both straps in the hand that is farther from the anchor point.

DESCRIPTION

- Step laterally away from the anchor point until the strap is taught.
- Hinge forward at the hips (similar to performing a Romanian deadlift), keep the arm extended, and press the hand toward the ground until a stretch is felt in the back of the shoulder (see figure).
- Hold this position for 10 to 30 seconds; then, repeat on the other side.

TEACHING CUES

- For a greater stretch, step farther from the anchor point.
- Stretch to the point of mild tension.
- Do not stretch to the point of pain.

Lower-Body Exercises

The chapter presents exercises to develop lower-body endurance, strength, mobility, and power. For advanced lifters, adding external resistance such as dumbbells, kettlebells, and weight vests can increase the intensity of many of the exercises.

Excursions

PURPOSE
To develop single-leg balance and hip stability.

PREREQUISITE
The ability to maintain balance on a single leg.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Stand facing the anchor point. Grasp the handles, bend the arms, and step back until there is no slack in the straps.

DESCRIPTION

- Assume a single-leg stance with the support foot maintaining full contact with the ground and the free foot about 3 inches (8 cm) off the ground (see figure *a*).
- Point the toe downward, and slide the foot forward as far as possible, as if reaching to the 3 o'clock position (see figure *b*).
- Return to the starting position; then repeat at the 12 o'clock position.

TEACHING CUES

- Do not move the support knee forward past the toes of the support foot.
- Make sure the big toe, little toe, and heel remain in contact with the ground on the stance foot throughout the movement.

Single-Leg Reaching Romanian Deadlift

PURPOSE
To develop single-leg balance and hip stability while stretching the hamstring of the stance leg as well as the latissimus dorsi.

PREREQUISITE
The ability to maintain balance on a single leg.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles, extend the arms with hands at chest level, and step back until there is no slack in the straps.

DESCRIPTION
- Assume a single-leg stance with the support foot maintaining full contact with the ground and the free foot lifted off the ground (see figure *a*).
- Bend at the hip while extending the free leg (see figure *b*).
- Keep the arms straight and, while holding the handles, reach out as far as possible.
- Return to the starting position, and repeat for the desired number of repetitions.

TEACHING CUES
- Keep the hips neutral and the toes of the free foot pointed downward.
- Turn the toes of the lead leg slightly inward. This typically puts the hip in the appropriate position and prevents rotation. When the hip rotates the hamstring, the stance leg shortens and the stretch is less effective.


a


b

Reverse Lunge With Knee Drive

PURPOSE
To develop single-leg balance, hip stability, and proper lower-body mechanics for the acceleration phase of a sprint.

PREREQUISITE
The ability to maintain balance on a single leg.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Face toward the anchor point. Position the hands at underarm level, and lean forward until the torso is at a 45-degree angle.

DESCRIPTION
- Take a step back so that the legs are in alignment with the torso, and perform a reverse lunge (see figure *a*).
- Drive the rear knee forward while extending the ankle, knee, and hip of the lead leg. The ankle of the drive leg should remain in a cast position, or with the toes pulled back toward the shin (see figure *b*).
- Maintain balance on the standing foot for a count of 2.
- Return to the starting position, and repeat on the opposite leg.

TEACHING CUES
- Stay straight as a board from the head through the heels.
- Keep the toes and knee up on the free leg.

Deep Squat

PURPOSE
To improve mobility at the ankles, knees, and hips, as well as lower-body muscular endurance.

PREREQUISITE
No lower-body joint pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Point the toes outward slightly (see figure *a*).
- Squat until the knees are bent at or more than 90 degrees. The knees should remain behind, or directly over, the toes (see figure *b*). Maintain a tall, neutral spine.
- Extend the hips, knees, and ankles, and return to the starting position.

TEACHING CUES

- Imagine standing in the center of a square, and drop the hips to the middle of the square.
- Keep the weight evenly distributed among the big toe, little toe, and heel.

Iso Squat

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance and joint stability.

PREREQUISITE
No lower-body joint pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Point the toes outward slightly (see figure *a*).
- Squat until the top of the knees are bent at or more than 90 degrees. The knees should remain behind, or directly over, the toes (see figure *b*). Maintain a tall, neutral spine.
- Hold this position for three to five seconds; then extend the hips, knees, and ankles, and return to the starting position.

TEACHING CUES

- Imagine standing in the center of a square, and drop the buttocks to the middle of the square.
- Keep the weight evenly distributed among the big toe, little toe, and heel.


a


b

Split Squat

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION
- Stagger the feet front and back with the toes facing straight ahead. The front foot should be flat on the ground (see figure *a*).
- The heel of the back foot should be up, and the weight should be on the ball of the foot.
- Lower the body by allowing the front knee to flex until the back knee is just above the ground (see figure *b*).
- Push through the front heel, and extend the ankle, knee, and hip to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drop the back knee straight down.
- Drive off the lead foot.


a


b

Overhead Squat

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance. This exercise also strengthens the muscles of the upper back.

PREREQUISITE
No lower-body joint pain or injury.

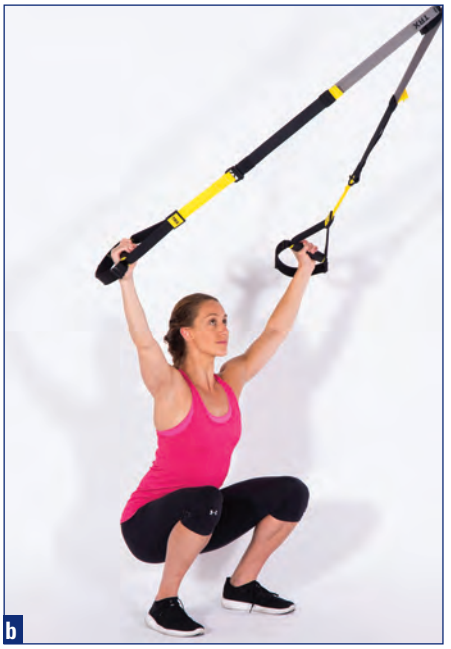
ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles, extend the arms overhead, and step back until there is no slack in the straps.

DESCRIPTION
- Point the toes outward slightly (see figure *a*).
- Squat until the knees are bent more than 90 degrees. The knees should remain behind, or directly over, the toes (see figure *b*).
- Extend the hips, knees, and ankles, and return to the starting position.

TEACHING CUES
- Imagine standing in the center of a square, and drop the buttocks to the middle of the square.
- Squeeze the shoulder blades together.
- Keep the weight evenly distributed among the big toe, little toe, and heel.


a


b

Lateral Squat

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION:

- Position the feet wider than shoulder width, with the heels in contact with the ground (see figure *a*).
- Keep both feet in position and shift the body weight to one side while bending the knee and pushing the hips back. At this point, the same-side glute and shoulder should be directly aligned with the heel (see figure *b*).
- The lead knee should be at 90 degrees, and the nonsquatting leg should be fully extended at the side.
- Push off the lead foot, return to the starting position, and then shift the weight to the opposite leg.

TEACHING CUES

- Keep the big toe, little toe, and heel in contact with the ground at all times.
- Keep the lead ankle, knee, and hip aligned.


a


b

Iso Lateral Squat

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance.

PREREQUISITE
No lower-body pain or injury

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Position the feet wider than shoulder width, with the heels in contact with the ground (see figure *a*).
- Keep both feet in position and shift the body weight to one side while bending the knee and pushing the hips back. At this point, the same-side glute and shoulder should be directly aligned with the heel (see figure *b*).
- The lead knee should be at 90 degrees, and the nonworking leg should be fully extended at the side.
- Hold this position for three to five seconds; then, push off the lead foot and return to the starting position.
- Shift the weight to the opposite leg and repeat.

TEACHING CUES

- Keep the big toe, little toe, and heel in contact with the ground at all times.
- Keep the lead ankle, knee, and hip aligned.


a


b

Lateral Lunge

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Position the feet together (see figure *a*).
- Step one foot to the side so that the feet are slightly wider than shoulder width. The heel of the stepping-leg foot should be in full contact with the ground.
- Shift the body weight toward the stepping leg, bend the knee, and drop the hips. At this point, the same-side glute and shoulder should be directly aligned with the heel of the stepping-leg foot (see figure *b*).
- The stepping-leg knee should be at 90 degrees, and the nonworking leg should be fully extended at the side.
- Push off the stepping-leg foot and return to the starting position; then, step to the opposite side and repeat.

TEACHING CUES

- Make certain the lead-leg big toe, little toe, and heel are in contact with the ground before descending into the lunge position.
- Drive off the lead leg to return to the starting position.

Sprinter Lunge

PURPOSE
To improve lower-body muscular endurance and coordination.

PREREQUISITES
Good balance and coordination, and no lower-body pain or injuries.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Stand facing the anchor point, and put one foot in the stirrups.

DESCRIPTION

- While maintaining a 90-degree bend at the elbow of the arm opposite the lead leg, take the hand toward the cheek and move the lead-leg-side hand toward the back hip pocket. Then, drop into a reverse lunge position. Allow the lead ankle, knee, and hip to bend until the thigh is parallel to the ground (see figure a).
- Simultaneously extend the lead leg and bring the back foot forward until the left side heel is in contact with the buttocks (see figure b).
- Swing the left arm back so that the left hand is touching the back hip pocket, and swing the right hand forward so that it is just to the side of the right cheek.
- Return to the starting position and repeat for the desired number of repetitions.

TEACHING CUES

- Make certain the lead knee stays aligned with the second toe of the lead foot.
- Swing the arms from lips to hips or from eye socket to hip pocket.
- Kick the heel to the buttocks.


a


b

Leg Sweep

PURPOSE
To develop balance, hip stability, strength, and endurance on a single leg.

PREREQUISITES
The ability to maintain balance on a single leg, and no pain or lower-body injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles, bend the arms, and step back until there is no slack in the straps.

DESCRIPTION
- Stand on the right leg with the right foot in full contact with the ground and the left foot about 3 inches (8 cm) off the ground (see figure *a*).
- Bend the right leg until the thigh is at a 110- to 130-degree angle; then reach the left foot toward the 4 o'clock position (see figure *b*).
- Repeat for the desired number of repetitions; then, switch legs.

TEACHING CUES
- Do not move the support knee forward past the toes of the support foot.
- Reach back as far as possible while maintaining balance and proper body alignment.

Calf Raise

PURPOSE
To develop the muscles on the posterior side of the lower leg.

PREREQUISITES
The ability to maintain balance, and no lower-leg injuries.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Stand facing away from the anchor point. Grasp the handles, bend the arms, and step forward until there is no slack in the straps.

DESCRIPTION

- Begin with the feet in full contact with the ground and the weight evenly distributed between the big toe and little toe (see figure *a*).
- Lift the heels and rise up on the toes (see figure *b*).
- Lower the heels to the ground and repeat.

TEACHING CUES

- Stand tall.
- Pause at the top for a count of 2.


a


b

Suspended Reverse Lunge

PURPOSE
To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance.

PREREQUISITES
The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing away from the anchor point. Place the trail foot in both foot cradles, and adjust the position until the straps are at a 110- to 130-degree angle to the ground (see figure *a*).

DESCRIPTION
- Lower the body by allowing the front knee to flex until it is at 90 degrees and the thigh is parallel to the ground (see figure *b*).
- Simultaneously push the suspended foot back.
- Push through the front heel, and extend the front knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then switch legs and repeat.

TEACHING CUES
- This exercise can be performed while holding the weight on the same side as the free leg.
- Drop the back knee straight down.
- Drive off the lead foot.

Lying Leg Curl

PURPOSE
To develop hamstring strength and endurance.

PREREQUISITE
The ability to maintain a plank position.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face up with the heels of each foot in the foot cradles. Place the hands to the sides of the torso with the palms down.

DESCRIPTION
- Extend the legs and lift the hips so that the trunk, legs, and shoulders are aligned (see figure *a*).
- Slowly bend the hips and knees while pulling the heels toward the buttocks (see figure *b*).
- Extend the hips and knees, and return to the starting position.
- To make this exercise more challenging, do not allow the hips to bend; rather, bend only at the knees. Note: the number of sets and reps should be equalized between limbs (i.e. sets × reps).


a


b

TEACHING CUES
- Brace the core.
- Keep in mind that control is more important than speed.
- Squeeze the hamstrings at the top of the movement.

Triangle Squat

PURPOSE
To develop hip mobility and stretch the adductors of the inner thigh.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point with the feet wider than shoulder width. Grasp the handles, bend the arms, and step back until there is no slack in the straps (see figure *a*).

DESCRIPTION
- Drop the hips down and back toward the right while keeping the chest up (see figure *b*).
- Once in the lateral squat position, shift the weight until it is all the way to the left (see figure *c*).
- Ascend to the beginning position; then repeat moving from left to right.
- Repeat for the desired number of repetitions.

TEACHING CUES
- Imagine scooting the buttocks across a park bench.
- Keep the hips low, chest up, and eyes focused straight ahead.


a


b


c

Pigeon Stretch

PURPOSE
To improve hip mobility and low back flexibility.

PREREQUISITES
No lower-body or back pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Facing the anchor point, sit on the ground with one leg outstretched behind and the other bent at the knee in front. Grasp a handle with each hand (see figure *a*).

DESCRIPTION

- Lean forward, pushing the chest toward the ground.
- Stretch to the point of mild discomfort, hold for 5 to 10 seconds, and then return to the starting position (see figure *b*).
- Repeat for 30 to 60 seconds; then, perform on the opposite side.

TEACHING CUES

- Maintain a big chest position.
- Breathe out while reaching forward.


a


b

Figure-Four Stretch

PURPOSE
To stretch the piriformis muscle and improve single-leg balance.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Facing the anchor point, stand on one foot with the ankle of the other foot crossed over the knee of the standing leg. Grasp a handle with each hand (see figure *a*).

DESCRIPTION

- Squat until the lead knee is at 90 degrees.
- Stretch to the point of mild discomfort, hold for 5 to 10 seconds, and then return to the starting position (see figure *b*).
- Repeat for 30 to 60 seconds; then, perform on the other side.

TEACHING CUES

- Maintain a big chest position.
- Breathe out while descending into the squat position.
- To increase the intensity, descend deeper into the squat position.

Reaching Hip Flexor Stretch

PURPOSE
To stretch the hip flexor muscles.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand on the left foot, grab the handles with the left hand, grab the right ankle with the right hand, and pull it back toward the buttock (see figure *a*).

DESCRIPTION

- While keeping the hips facing forward, bend forward at the waist (see figure *b*).
- Pull the right ankle back while pushing the right hip toward the ground.
- Stretch to the point of mild discomfort, hold for 5 to 10 seconds, and then return to the starting position.
- Repeat for 30 to 60 seconds; then, perform on the opposite side.

TEACHING CUES

- Keep the hips pointed toward the ground when leaning forward; do not let them rotate.
- Maintain an open chest.
- Breathe out on the descent.

Reverse Lunge

PURPOSE
To improve lower-body muscular endurance and coordination.

PREREQUISITES
Good balance and coordination, and no lower-body pain or injuries.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing away from the anchor point, place one foot in both foot cradles, and place your hands on your hips (see figure *a*).

DESCRIPTION

- While maintaining a rigid torso, drop down until the lead-leg thigh is parallel to the ground (see figure *b*).
- Extend the lead leg and bring the back foot forward until back in the starting position; then, repeat with the other leg.

TEACHING CUES

- Keep the lead knee aligned with the second toe of lead foot.
- Drive up on the lead leg as if pushing the ground away.

Single-Leg Calf Raise

PURPOSE
To develop the muscles on the back of the lower leg.

PREREQUISITES
The ability to maintain balance, and no lower-leg injuries.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Stand facing the anchor point. Grasp the handles, extend the arms, and step back until there is no slack in the straps.

DESCRIPTION

- Position one foot behind the other (see figure *a*).
- Lift the heel of the working leg, and rise up on the toes (see figure *b*).
- Lower the heel to the ground and repeat for the desired number of repetitions; then, switch legs.

TEACHING CUES

- Stand tall.
- Pause at the top for a count of 2.


a


b

Reverse Lunge With Chop and Lift

PURPOSE

To improve ankle, knee, and hip mobility, as well as lower-body strength and muscular endurance. This exercise can also be used to improve trunk stability and shoulder endurance. It also teaches upper- and lower-body dissociation, which may be important in sports in which players use implements, such as hockey and lacrosse.

PREREQUISITES

The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a medicine ball in both hands, and position it at hip level.

DESCRIPTION

- Push the suspended foot back until the feet are staggered; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground. At the same time, while keeping the arms completely straight, lift the medicine ball overhead (see figure *b*).
- Push through the front heel, and extend the knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES

- Drop the back knee straight down.
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.


a


b

Reverse Lunge With Horizontal Push

PURPOSE
To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance.

PREREQUISITES
The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a medicine ball in both hands, and position it across the chest.

DESCRIPTION
- Push the suspended foot back until the feet are staggered; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Lower the body by allowing the front knee to flex until the knee is at 90 degrees and the thigh is parallel to the ground. At the same time, while keeping the arms completely straight, press the medicine ball straight out in front of the body (see figure *b*).
- Push through the front heel and extend the knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drop the back knee straight down.
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.
- Keep the ball at shoulder height; if unable, use a lighter weight.

Suspended Single-Leg Deadlift

PURPOSE
To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance.

PREREQUISITES
The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are at a 110- to 130-degree angle to the ground. Grasp a pair of dumbbells or kettlebells, and hold them at either side of the lead leg (see figure *a*).

DESCRIPTION
- Lower the body by allowing the front knee to flex until it is at 90 degrees and the thigh is parallel to the ground (see figure *b*).
- Simultaneously push the suspended foot back.
- Push through the front heel and extend the knee and hip to return to the starting position.
- Extend the arms and return the dumbbells to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drive off the lead foot.
- Push the ground away.
- Maintain a rigid torso throughout the exercise.


a


b

Suspended Knee Extension

PURPOSE
To develop quadriceps strength and endurance.

PREREQUISITE
The ability to maintain a plank position.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

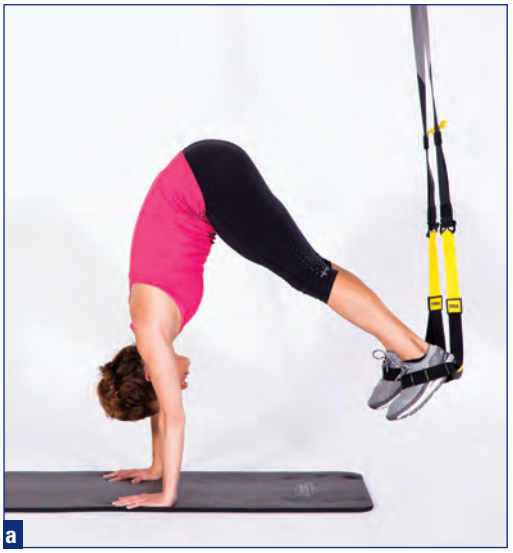
STARTING POSITION
Lie face down and place the feet in the foot cradles. Place the elbows directly under the shoulders; the hands should be in full contact with the ground.

DESCRIPTION

- Extend the arms and legs and lift the hips so that the trunk, the shoulders, and the hips are aligned (see figure *a*).
- Bend the knees and hips to 90 degrees (see figure *b*).
- Extend the knees and return to the starting position.

TEACHING CUES

- Move only at the knees.
- Brace the trunk.


a


b

Drop Squat

PURPOSE
To develop eccentric strength and stability while learning proper landing mechanics.

PREREQUISITES
No pain or lower-body injury, and the ability to perform a squat.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

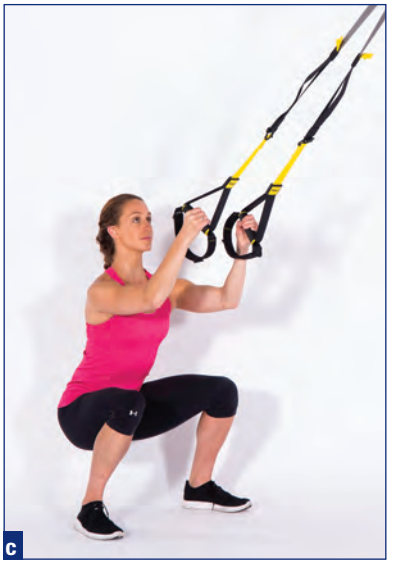
- Stand tall with the feet hip-width apart (see figure *a*).
- Rise up on the toes, and then rapidly split the feet to the side and land in the universal athletic position with the chest up, shoulders back, and a slight bend in the ankles, knees, and hips (see figure *b*).
- Land softly in a squat position (see figure *c*).
- Rise to return to the starting position.

TEACHING CUES

- Make sure the knees stay aligned with the first and second toes.
- Land with the knees just behind the toes and both feet in full contact with the ground.
- Land quietly, like a cat.
- Stick the landing.


a


b


c

Drop Split Squat

PURPOSE
To develop eccentric strength and stability in a staggered stance, as well as proper landing mechanics.

PREREQUISITE
No lower body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

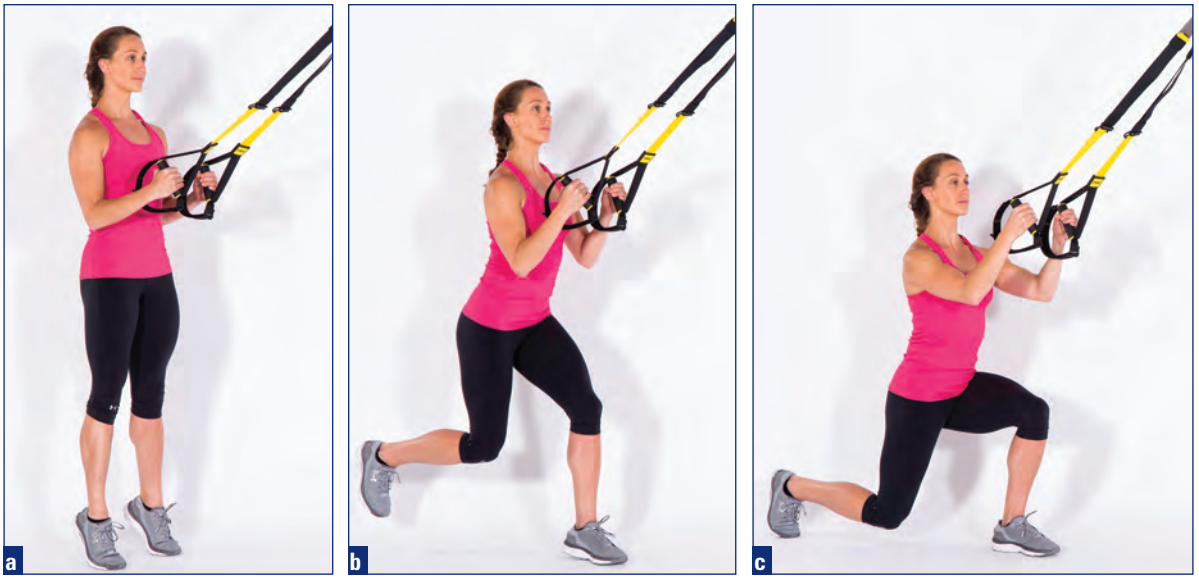
STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Stand tall with the feet hip-width apart.
- Rise up on the balls of the feet (see figure *a*).
- Rapidly drop and split the feet (see figure *b*), and land in a staggered position (see figure *c*).
- Push through the front heel, and extend the ankle, knees, and hips to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES

- Land quietly, like a cat.
- Stick the landing.



Squat Jump

PURPOSE
To develop concentric power of the lower body and proper landing mechanics.

PREREQUISITES
The ability to perform a proper squat and drop squat.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point with the feet about hip-width apart. Grasp the handles, bend the arms, and step back until there is no slack in the straps.

DESCRIPTION
- Flex the hips, knees, and ankles, and lower the body into a half-squat position (see figure *a*).
- Before coming to a complete stop, extend the knees and hips, jumping as high as possible off both feet (see figure *b*).
- Land in the takeoff position (see figure *c*).
- Hold this position for two or three seconds; then, perform the next jump.

TEACHING CUES
- Take off like a rocket.
- Land softly.

Countermovement Jump to Stick

PURPOSE
To develop lower-body power and proper landing mechanics.

PREREQUISITES
The ability to perform a proper squat and drop squat.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point with the feet about hip-width apart. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Flex the hips, knees, and ankles, and lower the body into a full squat (see figure *a*).
- Before coming to a complete stop, extend the knees and hips and jump as high as possible off both feet (see figure *b*).
- Land softly in the takeoff position, and stick the landing (see figure *c*).

TEACHING CUES

- Take off like a rocket.
- Land softly.

Lateral Skater With Stick

PURPOSE
To develop concentric power of the lower body, as well as knee and hip stability.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point with the feet about hip-width apart. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- With the feet hip-width apart, shift the weight to the left foot while lifting the right leg and bringing it behind the left leg (see figure *a*).
- Drive the right leg laterally, jumping to the right and landing on the right foot, with the left leg bent and crossing behind the right leg (see figure *b*).
- Stick the landing, pause for one or two seconds, and then bound back to the left side and stick the landing on the left foot.

TEACHING CUES

- Take off quickly, like a rubber ball bouncing off the ground.
- Land softly.


a


b

Split Squat Jump to Stick

PURPOSE
To develop eccentric strength and proper landing mechanics.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Stagger the feet front and back with the toes facing straight ahead (see figure *a*). The front foot should be flat on the ground. The heel of the back foot should be up, and the weight should be on the ball of the foot.
- Drop rapidly by flexing the front knee until it reaches 100 to 120 degrees (see figure *b*).
- Push through the front heel, and extend the ankles, knees, and hips to jump as high as possible (see figure *c*).
- Land softly in the starting position and stick the landing.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES

- Land softly.
- Take off like a rocket.

Pistol Squat

PURPOSE
To develop lower-body strength, endurance, stability, and mobility.

PREREQUISITES
No lower-body pain or injury, and the ability to maintain single-leg balance.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand on one foot while facing the anchor point (see figure *a*). Grasp the handles with the elbows bent, and step back until there is no slack in the straps.

DESCRIPTION
- Squat and extend the free leg out in front (see figure *b*).
- Return to the starting position, and repeat for the desired number of repetitions; then, switch and perform the same number of repetitions on the opposite leg.

TEACHING CUES
- Brace the trunk.
- Lift the free leg while descending into the squat.

Alternated Split Squat Jump to Stick

PURPOSE
To learn proper landing mechanics and improve lower-body coordination.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Stagger the feet front and back in a lunge position with the toes facing straight ahead. The front foot should be flat on the ground. The heel of the back foot should be up, and the weight should be on the ball of the foot.
- Quickly perform a small countermovement by flexing the front knee until it reaches 90 degrees (see figure *a*).
- Immediately push through the front heel; extend the ankles, knees, and hips; and jump as high as possible (see figure *b*).
- At the top of the jump, rapidly scissor the legs so that they switch positions (see figure *c*).
- Land softly and stick the landing (see figure *d*).
- Repeat for the desired number of repetitions, switching legs with each jump.

TEACHING CUES

- Land softly.
- Take off like a rocket.


a
b
c
d

Kettlebell Reverse Lunge

PURPOSE
To improve ankle, knee, and hip mobility, as well as lower-body muscular endurance and strength.

PREREQUISITES
The ability to maintain balance, and no lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
While holding two kettlebells or dumbbells at the sides (or in front of the shoulders), stand facing away from the anchor point. Place one foot in both foot cradles.

DESCRIPTION
- While holding the kettlebells or dumbbells, push the suspended foot back until the feet are staggered; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Flex the front knee until it is at 90 degrees and the thigh is parallel to the ground (see figure *b*).
- Push through the front heel, and extend the knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drop the back knee straight down.
- Drive off the lead foot.


a


b

Suitcase Reverse Lunge

PURPOSE

To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and trunk musculature (the trunk must flex laterally to resist the weight in the opposite hand).

PREREQUISITES

The ability to maintain balance, and no lower-body pain or injury.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a weight (e.g., dumbbell, kettlebell, handled medicine ball) in the hand opposite the stance leg.

DESCRIPTION

- Push the suspended foot back until the feet are in a staggered position; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground (see figure *b*).
- Push through the front heel and extend the knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then switch legs.

TEACHING CUES

- Do not allow the trunk to dip or flex in the direction of the weighted implement.
- Drop the back knee straight down.
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.


a


b

Reverse Lunge With Overhead Press

PURPOSE
To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance.

PREREQUISITES
The ability to maintain balance, and no lower-body or shoulder pain or injury.

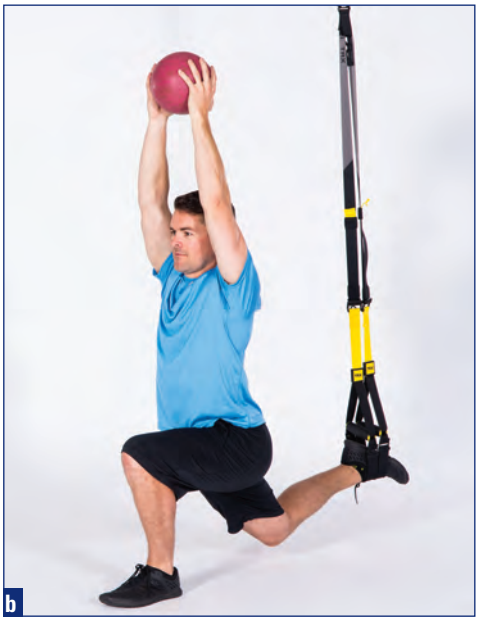
ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a medicine ball in both hands, and position it at the chest.

DESCRIPTION
- Push the suspended foot back until the feet are in a staggered position; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground. At the same time, press the medicine ball overhead while keeping the arms completely straight (see figure *b*).
- Push through the front heel, and extend the knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drop the back knee straight down.
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.
- Press the ball directly overhead.


a


b

Reverse Lunge With Single-Arm Overhead Press

PURPOSE

To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance.

PREREQUISITES

The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a weight (e.g., dumbbell, kettlebell, handled medicine ball) in the hand opposite the stance leg, and position it over the same-side shoulder.

DESCRIPTION

- Push the suspended foot back until the feet are in a staggered position; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground (see figure *b*).
- Push through the front heel and extend the knee and hip to rise up; simultaneously, press the weight overhead while keeping the arm completely straight (see figure *c*).
- Repeat for the desired number of repetitions; then switch legs and repeat.
- To make this exercise more challenging, press the weight up while descending into the lunge position. This teaches upper- and lower-body dissociation and coordination.

TEACHING CUES

- Drop the back knee straight down.
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.


a


b


c

Deadlift to Press

PURPOSE
To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance.

PREREQUISITES
The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are at a 110- to 130-degree angle to the ground. Grasp a pair of dumbbells, and hold them down at each side of the working leg.

DESCRIPTION
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground; simultaneously, push the suspended foot back (see figure *a*).
- Push through the front heel and extend the knee and hip to rise up while bending the arms to lift the dumbbells to shoulder level. At this point, the upper arms should be parallel to the ground (see figure *b*).
- Push the dumbbells overhead (see figure *c*).
- Slowly return the dumbbells to the shoulders; then, extend the arms to return the dumbbells to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.

Rear-Foot Elevated Overhead Squat

PURPOSE
To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; and trunk stability.

PREREQUISITES
The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a pair of dumbbells and hold them overhead.

DESCRIPTION
- Push the suspended foot back until the feet are in a staggered position; the toes should face straight ahead, and the lead foot should be flat on the ground (see figure *a*).
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground; simultaneously, press the arms overhead while keeping them completely straight (see figure *b*).
- Push through the front heel, and extend the knee and hip to return to the starting position.
- Repeat for the desired number of repetitions; then, switch legs and repeat.

TEACHING CUES
- Drop the back knee straight down.
- Drive off the lead foot.
- Maintain a rigid torso throughout the exercise.
- Keep the upper arms lined up with the ears.

Rear-Foot Elevated Muscle Clean to Press

PURPOSE

To improve ankle, knee, and hip mobility; lower-body strength and muscular endurance; trunk stability; and shoulder endurance. This drill is not performed for power the way a clean normally is; rather, it is for developing basic coordination.

PREREQUISITES

The ability to maintain balance, and no lower-body or shoulder pain or injury.

ADJUSTMENT

Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION

Stand facing away from the anchor point. Place one foot in both foot cradles, and adjust the position until the straps are roughly perpendicular to the ground. Grasp a pair of weights (e.g., dumbbells, kettlebells, handled medicine balls) in each hand and hold them down to each side.

DESCRIPTION

- Push the suspended foot back until the feet are staggered; the toes should face straight ahead, and the lead foot should be flat on the ground.
- Lower the body by flexing the front knee until it is at 90 degrees and the thigh is parallel to the ground (see figure *a*); in this position, perform a clean (see figure *b*).
- Extend the lead knee and hip to rise up. Slowly extend the left arm overhead until it is in an overhead squat position (see figure *c*).
- Lower the arms to return to the starting position.
- Repeat for the desired number of repetitions; then, switch both legs and arms and repeat.

TEACHING CUES

- Maintain a rigid torso throughout the exercise.
- Perform a slight dip to create momentum for the overhead press (i.e., dip and drive).

Single-Leg Lying Leg Curl

PURPOSE
To develop hamstring strength and endurance.

PREREQUISITE
The ability to maintain a plank position.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face up, and place one heel in both foot cradles. Place the hands to the sides with the palms down.

DESCRIPTION:

- Extend both legs and lift the hips so that the trunk, legs, and shoulders are aligned (see figure *a*).
- The free leg and hip should remain parallel to the working leg.
- Slowly bend the knee of the working leg and pull the heel toward the buttock (see figure *b*). The free leg can move next to the working leg.
- Extend the knee of the working leg, and return to the starting position.
- To make this exercise more challenging, cross the feet and do not allow the hips to bend; rather, bend only at the knees.


a


b

TEACHING CUES

- Brace the core.
- Keep in mind that control is more important than speed.
- Squeeze the hamstrings at the top of the movement.

Single-Leg Suspended Knee Extension

PURPOSE
To develop quadriceps strength and endurance.

PREREQUISITE
The ability to maintain a plank position.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face down and place one foot in both foot cradles. Extend the arms and place the hands directly under the shoulders. Once this has been accomplished, bend the knees and the hips to 90-degree angles (see figure *a*).

DESCRIPTION
- Extend the legs and lift the hips so that the trunk, the hips, and the shoulders are aligned (see figure *b*).
- Slowly bend the knees and lower yourself back to the starting position.

TEACHING CUES
- Maintain a rigid torso throughout the exercise.
- Push your hips and your glutes toward the ceiling.

Rear-Foot Elevated Drop Squat

PURPOSE
To develop eccentric strength and stability on a single leg while learning proper landing mechanics.

PREREQUISITES
No pain or lower-body injury, and the ability to perform a squat.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing away from the anchor point. Place one foot in a foot cradle, and adjust the position until the straps are at a 120- to 130-degree angle to the ground.

DESCRIPTION
- Rise up on the toes of the stance leg (see figure *a*).
- Rapidly drop the center of mass and, on landing, keep the chest up, shoulders back, and a slight bend in the ankles, knees, and hips (see figure *b*). The lead ankle should be 110 to 130 degrees on landing (see figure *c*).
- Extend the ankles, knees, and hips; hop back; and return to the starting position.

TEACHING CUES
- Drop the rear knee down and back, and make sure the lead knee stays aligned with the first and second toes.
- Land softly.

Repeat Countermovement Jump

PURPOSE
To develop lower-body power.

PREREQUISITES
The ability to perform a proper squat, drop squat, and countermovement jump to stick.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point with the feet about hip-width apart. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Flex the hips, knees, and ankles, and lower the body into a full squat (see figure *a*).
- Before coming to a complete stop, extend the knees and hips, jumping as high as possible off both feet (see figure *b*).
- Land in the takeoff position; then, immediately perform the next jump.

TEACHING CUES

- Take off like a rocket.
- Jump off the ground like a rubber ball.
- Land softly.

Repeat Lateral Skater

PURPOSE
To develop lower-body power.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point with the feet about hip-width apart. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Standing with the feet hip-width apart, shift the weight to the left foot while bringing the right leg behind the left leg (see figure *a*).
- Jump to the right, landing on the right foot with the left leg bent and behind the right leg (see figure *b*).
- Immediately bound back to the left side and stick the landing on the left foot.

TEACHING CUES

- Take off quickly like a rubber ball bouncing off the ground.
- Land softly.

Repeat Split Squat Jump

PURPOSE
To develop lower-body power in a staggered stance, as well as proper landing mechanics.

PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles with elbows bent and step back until there is no slack in the straps.

DESCRIPTION

- Stagger the feet front and back with the toes facing straight ahead. The front foot should be flat on the ground. The back heel should be up, and the weight should be on the ball of the foot (see figure *a*).
- Quickly perform a small countermovement by flexing the front knee until it reaches 90 degrees (see figure *b*).
- Immediately push through the front heel; extend the ankles, knees, and hips; and jump as high as possible (see figure *c*).
- Repeat for the desired number of repetitions; then switch legs and repeat.

TEACHING CUES

- Take off quickly like a rubber ball bouncing off the ground.
- Land softly.

Alternated Repeat Split Squat Jump

PURPOSE
To learn proper landing mechanics and improve lower-body coordination.

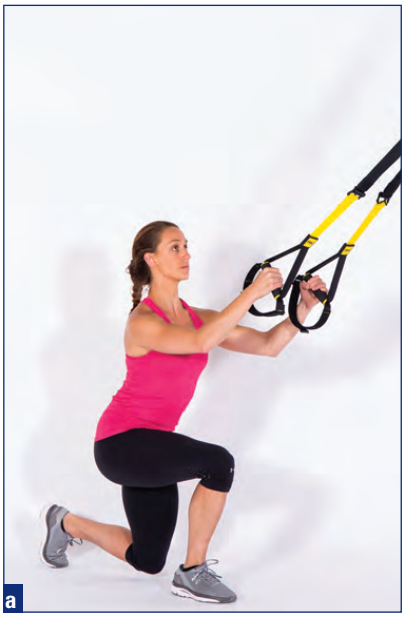
PREREQUISITE
No lower-body pain or injury.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Stand facing the anchor point. Grasp the handles, extend the arms, and step back until there is no slack in the straps.

DESCRIPTION
- Stagger the feet front and back with the toes facing straight ahead. The front foot should be flat on the ground. The back heel should be up, and the weight should be on the ball of the foot.
- Quickly perform a small countermovement by flexing the front knee until it reaches 90 degrees (see figure *a*).
- Immediately push through the front heel; extend the ankles, knees, and hips; and jump as high as possible (see figure *b*).
- At the top of the jump, rapidly scissor the legs so that they switch places (see figure *c*).
- Without resting between jumps, repeat for the desired number of repetitions, switching legs with each jump.

TEACHING CUES
- Take off quickly like a rubber ball bouncing off the ground.
- Land softly.


a


b


c

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CHAPTER 7

Core Exercises

Most of us have heard the parable about the builders that chose to build their house on sand rather than solid rock. Similarly, if we build fitness and performance on a poor foundation it decreases the opportunity for success and increases the risk of injury. Developing effective and efficient movement patterns is a complex process that requires the muscles to work in concert to produce, reduce, and stabilize forces. Quality movement is predicated on the ability to stabilize certain body segments and facilitate more efficient movements at others. Developing the muscles of the trunk, or core, stabilizes the spine against loading forces and creates a solid platform, or anchor point, for movement at the joints.

This chapter presents exercises for developing the trunk. Many can be used to establish a proper foundation of stability and mobility for the more advanced upper- and lower-body exercises in chapters 5 and 6.

Glute Bridge

PURPOSE
To develop hip and trunk stability, strength, and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face up and place the heels in the foot cradles. The hands are to the sides of the torso with the palms up (see figure *a*).

DESCRIPTION
- Begin with one heel in each stirrup. Bend the knees and the hips at a 90-degree angle and lift the hips off the ground (see figure *b*).
- Hold this position for 30 to 60 seconds.
- For an added challenge, slowly lower the hips until they are 1 inch (2.5 cm) from the ground; then, return to the starting position. Repeat for 10 to 12 repetitions and for the desired number of sets.

TEACHING CUES
- Squeeze the glutes.
- Brace the trunk as if readying for a punch to the abdomen.


a


b

Standing Plank

PURPOSE
To develop trunk stability and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Face away from the anchor point, and grab a handle with each hand. Position the hands shoulder-width apart.

DESCRIPTION

- Set the body in a straight line. Brace the trunk, keep the arms straight, and slowly step back until there is tension on the straps and the body is at an incline.
- Simultaneously pull the shoulder blades down and together (see figure).
- While keeping the arms straight, attempt to hold this position for 30 to 60 seconds.

TEACHING CUES

- Put the edges of the scapulae in the back hip pockets.
- Stay straight as a board from the head through the heels.

Elbow Plank

PURPOSE
To develop trunk stability and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face down with the forearms on the ground and facing away from the anchor point. Place the feet in the stirrups.

DESCRIPTION

- In one continuous movement, lift the hips and torso until the elbows are directly under the shoulders and the upper arms are perpendicular to the ground (see figure).
- Attempt to hold this position for 30 to 60 seconds.

TEACHING CUES

- Put the edges of the scapulae in the back hip pocket.
- Stay straight as a board from the head through the heels.

Supine Plank

PURPOSE
To develop hip and trunk stability, strength, and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face up and place the heels in the stirrups. Place the hands to the sides of the torso with the palms up.

DESCRIPTION

- Extend the legs and lift the hips so that the trunk, legs, and shoulders are aligned (see figure).
- Hold this position for 30 to 60 seconds.
- For an added challenge, slowly lower the hips until they are 1 inch (2.5 cm) from the ground; then, return to the starting position. Repeat for 10 to 12 repetitions and for the desired number of sets.

TEACHING CUES

- Squeeze the glutes
- Brace the trunk as if readying for a punch to the abdomen.

Single-Leg Plank

PURPOSE
To develop hip and trunk stability, strength, and endurance.

PREREQUISITES
No pain while performing the movement, and the ability to stabilize the pelvis and resist hip rotation.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Lie face up and place one heel into a stirrup. The hands are to the sides of the torso with the palms up

DESCRIPTION

- Extend both legs and lift the hips so that the trunk, legs, and shoulders are aligned (see figure). The free leg and hip should remain parallel to the working leg.
- Hold this position for 30 to 60 seconds.
- For an added challenge, slowly lower the hips until they are 1 inch (2.5 cm) from the ground; then, return to the starting position. Repeat for 10 to 12 repetitions and for the desired number of sets. Note: The number of sets and reps should be equalized between limbs. In other words, be sure to perform the same volume (sets × reps × time using each foot in the stirrup. Cluster sets may also be used to accomplish this (see chapter 8).

TEACHING CUES

- Squeeze the glutes.
- Brace the trunk as if readying for a punch to the abdomen.
- Do not allow the hips to rotate.

Extended-Arm Plank

PURPOSE
To develop trunk stability and endurance.

PREREQUISITES
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart.

DESCRIPTION

- Set the body in a straight line, brace the trunk, and keep the arms straight (see figure).
- Simultaneously pull the shoulder blades down and together.
- Attempt to hold this position for 30 to 60 seconds.

TEACHING CUES

- Put the edges of the scapulae in the back hip pockets.
- Stay straight as a board from the head through the heels.

Sprinter Plank

PURPOSE
To develop hip and trunk stability and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place one foot in both stirrups. Place the hands on the ground shoulder-width apart.

DESCRIPTION

- Set the body in a straight line, brace the trunk, and keep the arms straight (see figure *a*).
- Simultaneously pull the shoulder blades down and together.
- While keeping the arms and torso straight, drive the free knee up toward the chest until the knee and hip are at 90-degree angles (see figure *b*). The ankle should remain flexed.
- Hold this position for 15 to 30 seconds; then repeat on the opposite side.


a


b

TEACHING CUES

- Put the edges of the scapulae in the back hip pockets.
- Stay straight as a board from the head through the heels.
- Keep the toe up, heel up, and knee up on the free leg.

Side Plank

PURPOSE
To develop trunk and hip stability and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups.

DESCRIPTION

- Lie on the right side with the right forearm in contact with the ground, the elbow directly under the shoulder, and the right foot behind the left.
- Place the left hand on the left hip, and then lift the hips until the torso is parallel to the ground (see figure).
- Hold this position for the desired amount of time, and then repeat on the opposite side.
- For an added challenge to core stability, extend the top arm and reach toward the ceiling, or lower the hip until it is 6 inches (15 cm) from the ground; then, return to the starting position.

TEACHING CUES

- Put the edges of the scapulae in the back hip pockets.
- Stay straight as a board from the head through the heels.

Rotational Side Plank

PURPOSE
To develop trunk stability, mobility, and endurance.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups.

DESCRIPTION

- Lie on the right side with the right forearm in contact with the ground, the elbow directly under the shoulder, and the right foot behind the left.
- Place the left hand on the left side of the thigh; then, lift the hips until the torso is parallel to the ground.
- Extend the top arm and reach toward the ceiling (see figure *a*).
- Rotate the torso and then reach the hand down and back behind the body (see figure *b*).
- Hold this position for the desired amount of time, and then repeat on the opposite side.


a


b

TEACHING CUES

- Put the edges of the scapulae in the back hip pockets.
- Stay straight as a board from the head through the heels.
- For more of a challenge, extend the bracing arm.

Palov Press

PURPOSE
To develop trunk and shoulder stability and endurance.

PREREQUISITES
No pain while performing the movement, and no preexisting shoulder injuries.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face to the side of the anchor point, and grasp the handles in both hands using a neutral grip.

DESCRIPTION

- Stagger the feet front and back. The foot farther from the anchor point should be the lead foot.
- While keeping the hands close to the chest, lean laterally so that the torso is at 30 to 45 degrees to the ground (see figure *a*).
- While keeping the torso rigid, press the hands away from the body and extend the arms (see figure *b*).
- Slowly bend the arms and return to the starting position.
- Perform for the desired number of repetitions, turn 180 degrees, and repeat.

TEACHING CUES

- Squeeze the glutes
- Brace the trunk as if readying for a punch to the abdomen.
- If unable to fully extend the arms, walk farther from the anchor point to reduce the amount of lean and lighten the resistance, or extend the arms as far as possible and progress over time until able to fully extend the arms (i.e., use a partial to whole range of motion).


a


b

Reverse Crunch

PURPOSE
To develop muscular endurance and stability of the trunk.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart.

DESCRIPTION
- Set the body in a straight line, or plank position, brace the trunk, and keep the arms straight (see figure *a*).
- Pull the shoulder blades down and together while pulling both knees toward the chest (see figure *b*).
- Return to the starting position, and continue this movement for the desired number of repetitions.


a


b

TEACHING CUES
- Brace the core first; then drive the knees toward the chest.
- Control the movement. Perform at an even tempo (e.g., a count of 2 for the crunch and a count of 2 to return to the fully extended position).

Bicycle Crunch

PURPOSE
To develop muscular endurance and stability of the trunk.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart.

DESCRIPTION
- Set the body in a straight line, or plank position, brace the trunk, and keep the arms straight (see figure *a*).
- Simultaneously pull the shoulder blades down and together and bring the right knee up toward the chest (see figure *b*).
- While the right leg returns to the starting position, bring the left leg toward the chest in the same manner.
- Continue this movement, alternating between right and left sides as if pedaling a bike.


a


b

TEACHING CUES
- Brace the core first; then drive the knee toward the chest.
- Control the movement. Perform at an even tempo (e.g., a count of 2 for the crunch and a count of 2 to return to the fully extended position).

Rotational Crunch

PURPOSE
To develop muscular endurance, mobility, and stability of the trunk.

PREREQUISITE
No pain while performing the movement.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart.

DESCRIPTION

- Set the body in a straight line, or plank position, brace the trunk, and keep the arms straight (see figure *a*).
- Simultaneously pull the shoulder blades down and together and bring the right knee up toward the left shoulder (see figure *b*).
- While the right leg returns to the starting position, bring the left leg toward the right shoulder in the same manner; then, return to the starting position.
- Continue this movement, alternating between right and left sides as if pedaling a bike.

TEACHING CUES

- Brace the core before moving the lower body.
- Control the movement. Use an even tempo when lifting the knees and returning to the starting position.

Kneeling Rollout

PURPOSE
To develop muscular endurance, eccentric strength, and stability of the trunk.

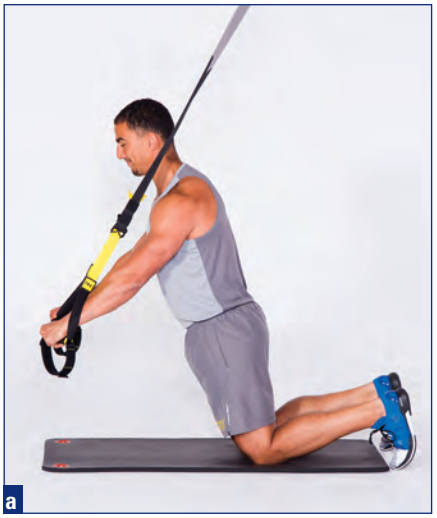
PREREQUISITES
No pain while performing the movement, and the ability to perform a plank.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Kneel facing the anchor point and back up until the straps are at a 45-degree angle. Grasp the handles with an overhand, shoulder-width grip.

DESCRIPTION
- Pull the toes back toward the shins (see figure *a*). While keeping the knees and toes fixed on the ground, arms taut, and torso stiff, lean forward as far as possible without touching the ground (see figure *b*).
- Return to the starting position by contracting the abdominal muscles, and then return along the same path to the starting position.
- Perform the desired number of repetitions.

TEACHING CUES
- Keep the back flat.
- Brace the trunk.
- Control the movement. Use an even tempo during the lowering phase and on the return to the starting position.


a


b

Standing Lateral Twist

PURPOSE
To develop muscular endurance, eccentric strength, mobility, and stability of the trunk.

PREREQUISITES
No pain while performing the movement, and the ability to perform a plank.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Face sideways to the anchor point, and grasp the handles in both hands using a neutral grip. Stagger the stance so that one foot is closer to the anchor point.

DESCRIPTION

- While keeping the arms slightly bent, lean laterally until the torso is at a 30- to 45-degree angle to the ground (see figure *a*).
- While keeping the arms locked in the starting position and the torso rigid, rotate the shoulders toward the anchor point (see figure *b*).
- Perform the desired number of repetitions; then, repeat turning toward the right.

TEACHING CUES

- Brace the core.
- Pull the strap toward the midline of the body.

Standing Russian Twist

PURPOSE
To develop muscular endurance, eccentric strength, mobility, and stability of the trunk.

PREREQUISITES
No pain while performing the movement, and the ability to perform a plank.

ADJUSTMENT
Fully lengthen the straps of the Suspension trainer.

STARTING POSITION
Face the anchor point, and grasp the handles in both hands using a neutral grip.

DESCRIPTION

- While keeping the arms slightly bent, lean back until the torso is at a 45-degree angle to the ground (see figure *a*).
- Pull the shoulder blades together and downward while rotating the torso to the right. Keep the feet planted in the starting position (see figure *b*).
- Perform the desired number of repetitions; then, repeat turning toward the left.

TEACHING CUES

- Brace the core.
- Pull the straps toward the midline of the body.

Power Pull

PURPOSE
To develop muscular endurance, eccentric strength, mobility, and stability of the trunk.

PREREQUISITES
No pain while performing the movement, and the ability to perform a plank.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-length.

STARTING POSITION
Face the anchor point, grasp the handles with one hand using a neutral grip, and touch the handle with the palm of the free hand.

DESCRIPTION
- While keeping the arms straight, lean back until the torso is at a 45-degree angle to the ground.
- Rotate the torso toward the free-hand side, and reach back as far as possible (see figure *a*).
- Pull the strap to bring the working elbow into the rib cage while pivoting on the toes and reaching with the free arm toward the straps (see figure *b*).
- Once balanced, slowly return to the starting position.
- Perform the desired number of repetitions; then, repeat turning toward the right.

TEACHING CUES
- Reach for the ground; then reach for the ceiling.
- Keep the eyes on the lead hand.


a


b

Standing Oblique Crunch

PURPOSE
To develop muscular endurance, eccentric strength, mobility, and stability of the trunk.

PREREQUISITES
No pain while performing the movement, and the ability to perform a plank.

ADJUSTMENT
Fully shorten the straps of the Suspension Trainer.

STARTING POSITION
Face sideways to the anchor point and grasp the handles in both hands using a neutral grip.

DESCRIPTION
- Facing sideways (see figure *a*), keep the arms slightly bent and lean away from the anchor point by allowing the trunk to flex laterally toward the anchor point and the hips to shift in the opposite direction (see figure *b*).
- To return to the starting position, contract the obliques on the side furthest from the anchor point until the trunk is in a neutral position.

TEACHING CUES
- On the descent, drop the hips toward the ground.
- On the ascent, push the hips toward the anchor point and the hands toward the ground.

Extended-Arm Side Plank

PURPOSE
To develop hip, trunk, and shoulder stability and endurance.

PREREQUISITES
No pain while performing the movement, and no preexisting shoulder injuries.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups.

DESCRIPTION

- Perform a side plank with the arm fully extended (see figure).
- Hold this position for the desired amount of time, and then repeat on the opposite side.

TEACHING CUES

- Place the scapulae in the back hip pockets.
- Stay straight as a board from the head through the heels.
- For more of a challenge, lower the hip until it is 6 inches (15 cm) from the ground; then, return to the side plank position.

Crab Plank

PURPOSE
To develop trunk and shoulder stability, mobility, and endurance.

PREREQUISITES
No pain while performing the movement, and no preexisting shoulder injuries.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
From a seated position, place the heels in the stirrups with the arms extended to the sides and the hands in contact with the ground.

DESCRIPTION
- Walk the hands back until the shoulders are in a hyperextended position (see figure *a*).
- Extend the legs and lift the hips so that the trunk, legs, and shoulders are aligned (see figure *b*).
- Hold this position for 30 to 60 seconds.
- For an added challenge, slowly lower the hips until they are 1 inch (2.5 cm) from the ground; then, return to the starting position. Perform 10 to 12 repetitions for the desired number of sets.


a


b

TEACHING CUES
- Squeeze the glutes.
- Brace the trunk as if readying for a punch to the abdomen.

Pike

PURPOSE
To develop muscular endurance, mobility, and stability of the trunk, as well as improve hamstring flexibility.

PREREQUISITES
No pain while performing the movement, good hip mobility, and the ability to perform a plank.

ADJUSTMENT
Adjust the straps of the Suspension Trainer to mid-calf length.

STARTING POSITION
Face away from the anchor point, and place the feet in the stirrups. Place the hands on the ground shoulder-width apart.

DESCRIPTION
- Set the body in a straight line, or plank position, brace the trunk, and keep the arms straight (see figure *a*).
- Simultaneously pull the shoulder blades down and together while flexing the hips and pushing the buttocks up. Keep the legs completely straight while bringing the feet toward the chest (see figure *b*).
- At the end of the movement, the shoulders and back should be as close to perpendicular to the ground as possible.
- Return to the starting position, and repeat for the desired number of repetitions.


a


b

TEACHING CUES
- Brace the core before moving the lower body.
- Control the movement. Use an even tempo when lifting the knees and returning to the starting position.
- Place the head between the upper arms, and push the buttocks to the ceiling.

Standing Rollout

PURPOSE
To develop muscular endurance, eccentric strength, and stability of the trunk.

PREREQUISITES
No pain while performing the movement, and the ability to perform a plank.

ADJUSTMENT
Fully lengthen the straps of the Suspension Trainer.

STARTING POSITION
Face the anchor point, and grab a handle in each hand.

DESCRIPTION

- Set the body in a straight line, or plank position, brace the trunk, and keep the arms straight out in front at shoulder height (see figure *a*).
- While keeping the arms completely straight, lean the torso forward and flex the shoulder so that the arms are extended overhead (see figure *b*).
- Contract the abs and the lats to return to the starting position.

TEACHING CUES

- Keep the back flat.
- Brace the trunk.
- Control the movement. Use an even tempo during the lowering phase and on the return to the starting position.


a


b

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Suspension Training Programs

Part III shows how to use the exercises and apply the science covered in parts I and II to develop Suspension Training programs. The sample programs can be used as stand-alone modalities or as part of comprehensive strength and conditioning programs that include other forms of resistance training (e.g., barbells, dumbbells, resistance training machines).

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CHAPTER 8

Foundations of Program Design

Dumping a bunch of random ingredients into a bowl would be highly unlikely to result in a gourmet meal. Training, too, requires a systematic rather than random approach to maximize results. Excellence does not occur by chance; it requires planning, focused effort, and consistency. This chapter presents the foundations of a comprehensive fitness program as well as principles to guide decision making when developing a training plan.

Principles of Training and Conditioning

Regardless of the training goal, six key principles should be followed when developing a training program. Progressive overload, load variation, specificity, individuality, diminishing returns, and reversibility must all be addressed to maximize progress and ensure long-term improvements.

Progressive Overload

Stress is often perceived as a negative experience or state. However, when presented with the right types of stress in the proper amounts, the body can transform in miraculous ways. The principle of progressive overload states that applying a stressor beyond what the body is accustomed to, in a systematic and progressive way, results in an adaptation to the new demands. Too much stress, or stress applied too frequently, may increase injury risk or cause maladaptation. Too little stress, or stress applied too infrequently, will result in no progress or adaptations. For this reason, some consider the stress induced via exercise to be like medicine: we need the right dose in the right amount to get the best results.

Load Variation

Progressive overload is paramount to success, but the load applied to the body should not progress in a strictly linear way. People can't lift or train hard all the time. Without some variation in the training cycle, the body cannot realize fitness gains because of the accumulation of fatigue. To realize fitness gains, the body must be allowed to recover. This is one reason for using a periodized strength and conditioning program, which provides small fluctuations in intensity and volume in the short term. In a periodized program, short-term variations occur, but the overall trend is toward increasing fitness.

Numerous forms of periodization can be used to improve health, fitness, and performance. The design selected is based on a variety of factor such as goals, time constraints, and equipment availability. Several forms of periodization, with examples, are presented in the sidebar, Basics of Periodization.

Specificity

In the most simplistic terms, the specificity principle states that you get what you train for. This relates to improving the quality of specific muscles (e.g., quadriceps, biceps), overall muscle qualities (e.g., endurance, strength, power), movements (e.g., pushing, pulling, squatting), muscle actions (i.e., concentric, eccentric, isometric), and conditioning (i.e., anaerobic or aerobic). Receiving the greatest benefit from a training program requires setting goals and then determining which variables to consider to reach those goals.

One critical aspect of specificity that is often overlooked is that some exercises look nothing like the movements they improve. For example, lying face up and performing a hip bridge may look nothing like high-speed running. However, this exercise is excellent for strengthening the glutes and the muscles surrounding the hips, which may contribute to greater stability on the stance leg during gait, a reduced risk of injury from biomechanical inefficiencies, and better force production at ground contact. Because this exercise isolates muscles that may contribute to improved performance, it is deemed functional for improving running speed. Specificity does not mean mimicry. Some exercises develop the parts that contribute to improving the whole.

Individuality

Although for the most part we are fairly similar physiologically, we respond to training programs differently based on our fitness levels, genetics, and anthropometrics (e.g., body size, limb and torso length). A beginner who takes part in a training program designed for an elite athlete may very well overtrain. Similarly, an advanced athlete in a beginner's program would likely detrain and experience reductions in performance.

Tall people may experience less increases in muscle size than shorter people because longer limbs, or levers, tend to favor speed, whereas shorter levers tend to favor strength. Additionally, when performing a push-up, someone with longer arms has to do more mechanical work than someone with shorter arms because of the need to cover a greater distance to perform the same task. The shorter person may appear to increase muscle size to a greater extent, whereas the taller person may accrue just as much lean mass, but it may look less bulky because of the length of the muscle. Although a training program may affect some factors, some are genetic and cannot be altered.

Basics of Periodization

Periodization can be a very confusing topic. To simplify it, I define it as planning change over time to maximize results. Essentially, periodization is a systematic approach to altering the training variables to ensure continued progress and to minimize overtraining injuries. Of the numerous variations of periodization, I focus on the two major types: linear and nonlinear.

Linear Periodization

Linear periodization, also referred to as classic periodization, uses training blocks that enhance specific physical attributes. Each phase supports the subsequent phase. These phases consist of the following cycles:

- *Macrocycle*—A macrocycle is the big picture. Typically, it consists of a full year of training. However, it may also be a four-year cycle for athletes such as Olympians who are looking to peak for Olympic trials or competitions. A macrocycle is made up of a series of mesocycles.
- *Mesocycle*—A mesocycle is a block of training that generally lasts between six and eight weeks. A mesocycle consists of a series of microcycles.
- *Microcycle*—A microcycle is typically a one- to two-week block of training. At the beginning of a linear periodization program, the emphasis is generally on improving movement proficiency, improving muscular endurance, and increasing muscle size. During this phase, strength also improves, although this is not the main focus. At this stage, Suspension Training can be used extensively to improve muscular endurance, improve movement quality, and facilitate rehabilitation. Most beginners experience rapid changes in coordination and strength as a result of a variety of neurological influences (e.g., greater rate coding and synchronization).

After about 6 to 12 weeks of training, the focus starts to shift from increasing general muscular fitness to increasing muscular size and strength. Increasing size increases force-generating capacity by increasing muscle cross-sectional area. In addition, neurological changes occur as a result of lifting heavier loads, allowing for greater loads to be lifted than before. Suspension Training plays a critical role in this phase. Suspension Training exercises can increase the overall density of a training session (i.e., more work in less time), unload muscles and muscle groups to enhance recovery while minimizing losses, and to help reduce and minimize potential injury.

The last phase of a linear periodization cycle tends to focus on maximizing strength and power. During this phase, Suspension Training is very useful during the dynamic warm-up to wake up stabilizer muscles while taking the emphasis off the prime movers. During this stage, Suspension Training can be a very effective method of periodically unloading and reducing fatigue that has been accrued via heavy or very intense training. This may also help reduce the stress on the body to minimize the risk of injury and overtraining.

Nonlinear Periodization

Nonlinear periodization follows a similar pattern to linear periodization, although the training is altered more quickly (i.e., addressing muscular endurance, fitness, strength, and power within a week). For example, a Monday session may focus on muscular endurance; Wednesday, on muscular power; and Friday, on muscle size or strength (or both). Nonlinear periodization tends to work well for those with more experience and a good training foundation. It also works well for those who may not need to peak for a particular competition or event, but rather want to maintain a level of fitness in all muscle qualities year round, such as fitness enthusiasts or tactical athletes (e.g., soldiers, firefighters, law enforcement officers).

Diminishing Returns

Someone new to exercise can generally take part in any training program for six to eight weeks and see significant improvements. However, as the body adapts, new and different stimuli must be applied to keep making progress. As fitness increases, we near our genetic potential, and the gains we experience become more marginal, or slow down. Suspension Training is a fantastic tool for improving muscular strength during the early stages of a training program. However, at a certain point, straps and body positions must be manipulated to increase the load and to keep getting stronger. Eventually, Suspension Training may not be the primary tool used to continue improving strength; rather, it may be used to maintain strength, improve endurance, or prevent injury in addition to a more traditional weight training program that allows heavier loads to be utilized.

Reversibility

The reversibility principle is related to the amount, frequency, and consistency of the stress applied to the body. This principle is summed up in the phrase *Use it or lose it.* Stopping training, or significantly reducing the training load, volume, or frequency long enough will result in regression, potentially to pretraining levels. One benefit of Suspension Training is its portability and convenience at times when keeping up normal training schedules is difficult. Maintaining stress on the body during these times can prevent, or at least slow, the detraining process. For example, soldiers on deployment frequently use Suspension Training to maintain fitness when they do not have access to regular training facilities or traditional weight training equipment such as barbells and dumbbells. Additionally, Suspension Training is great for frequent travelers since the equipment takes up minimal space and can be thrown into a bag or suitcase. This helps travelers reduce the number of training days missed while on the road.

Variables of Training Program Design

When designing a training program, the frequency, intensity, volume, and speed of training must be considered. Equally important are the rest periods between sets in each session as well as between training days.

Frequency

Frequency of training refers to the number of training sessions performed, usually in the context of a week. The frequency of training is predicated on factors such as the initial training level, the time available, and training goals. For example, two or three training sessions per week would likely suffice if the goal is to improve general fitness. To maintain fitness, one session may suffice, although two (at least) are generally recommended. To reach more robust goals, such as significantly increasing muscle mass, anywhere from three to six days per week may be ideal.

Intensity

Intensity, which refers to the training load (i.e., the amount of weight lifted), may be the factor most critical to the outcome of a training program. In general, loads that permit 12 or more repetitions are suited to improving muscular endurance. Loads that permit between 8 and 12 repetitions are suited to improving muscle size or general fitness (depending on the volume, or sets × reps). Finally, a training load that permits 6 or fewer repetitions is best for improving strength. This does not mean that training in a range more suited to improving endurance will not enhance strength, or vice versa; it just would not optimize gains in the targeted area. This is a critical consideration for Suspension Training, especially for already well-trained individuals, and will be further addressed in chapter 11.

Volume

Volume of training can be defined as the number of sets multiplied by the number of repetitions (sets \x\ reps) performed, or as the load multiplied by the number of sets and repetitions. When using traditional equipment such as barbells and dumbbells, volume is typically calculated using the latter equation. However, those using body weight as resistance (i.e., Suspension Training) generally multiply sets by repetitions because the load moved is often difficult to quantify and varies based on body position. Furthermore, when performing isometric work, such as a plank, sets multiplied by time may be used to quantify volume. For many of the exercises that require one foot in a strap, the overall volume can be equalized by making certain that each limb receives the same amount of stress or time under tension. This can be achieved by performing what is commonly known as a cluster set with the weaker limb. To complete a cluster set, perform as many repetitions as possible, take a brief 10- to 15-second rest, and then complete the set. For instance, suppose you can perform 60 seconds of work on the stronger limb and only 50 seconds of work on the weaker limb. When working on the weaker limb, simply take a break at 50 seconds. Then, perform 10 more seconds of work on the weak limb when you can. The cluster set technique helps you to maintain overall training volume and to use good form throughout the set. This is very important for maintaining body symmetry.

Speed

Speed of movement is an often-overlooked variable in resistance training programs. However, it is critical when seeking to develop specific attributes. For example, power is the optimal combination of force and velocity to achieve a specific task; every exercise has its own unique power profile. Therefore, the speed of movement during a rep will either increase or decrease the amount of power produced. Because resistance training exercise is mostly used to improve performance, which is specifically related to power production, speed of movement should be considered in every exercise.

In general, the speed of movement is directly related to and dependent on the load being moved. Maximal loads cannot be moved quickly because creating

the appropriate amount of force takes time. Therefore, maximal exercises do not directly improve power. However, this is not to say that maximal lifting does not improve power. Improving overall strength results in being able to move a given load faster because a smaller percentage of maximal strength is required at a submaximal load. For these reasons, using a variety of training loads at different speeds is ideal for improving performance.

Rest

Rest refers to the amount of time between sets and between training sessions. The amount of rest has a significant impact on the quality of the workout and the outcome. To improve muscular endurance, rest periods of 30 to 60 seconds between sets for the same muscles or muscle groups are generally recommended. However, alternating opposing muscle groups (e.g., chest and back) or movements (e.g., push and pull) in the training session creates sufficient rest between muscle groups. This is very beneficial for those with time constraints. To improve muscular fitness or muscle size, rest periods between 30 and 90 seconds are adequate. For strength and power, greater rest periods (three to five minutes) are required to fully replenish energy stores and ensure sufficient effort in subsequent repetitions.

The rest required between training sessions should also be considered. For sufficient recovery, a minimum of 48 hours (and up to 72 hours) should be allowed before muscle groups are trained again. Following a Monday session aimed at training the lower body, the next lower-body training session should be on Wednesday or Thursday to give these muscles time to recover. Table 8.1 provides basic recommendations for each training variable to use when creating plans based on specific training goals.

Training should not be a random process; basic principles of training and conditioning should be followed to maximize results. A periodized program can ensure safe and effective progress and continuing challenge with new stimuli to help with working through training plateaus.

Chapters 9 to 13 describe how to use Suspension Training in the context of periodized training, and provide sample training programs for improving specific aspects of health, fitness, and performance. In these chapters, a detailed explanation of how to integrate Suspension Training into a comprehensive program using a variety of training tools and modalities is also addressed.

TABLE 8.1 Basic Training Guidelines

	Frequency	Intensity	Volume	Speed	Rest between sets
Muscular endurance	2 or 3 days per week	60% of 1RM	1 or 2 exercises per muscle group or movement; 2 or 3 sets for each muscle group or movement; 10-20 reps of each exercise	Variable	30-60 sec between muscle groups
Muscular fitness	3 or 4 days per week	60-75% of 1RM	1 or 2 exercises per muscle group or movement; 3-6 sets for each muscle group or movement; 10-12 reps of each exercise	Moderate	30-90 sec between muscle groups
Muscle size	3-6 days per week	60-75% of 1RM	2 or 3 exercises or muscle group or movement; 3-6 sets for each muscle group or movement; 6-20 reps of each exercise	Slow to moderate	60-90 sec between muscle groups
Muscular strength	3-6 days per week	Basic strength: 80-90% of 1RM Max strength: 93% of 1RM Maintenance: 80-85% of 1RM	1-3 exercises or muscle group or movement Basic strength: 4-8 reps Max strength: 2-6 reps Maintenance: 6-8 reps	Slow	2-5 min between muscle groups
Muscular power	2 or 3 days per week	87-95% of 1RM for a single rep 75-90% for multiple reps Variable when using own body weight	1RM for max efforts 6 for multiple reps 6-10 reps for body weight–based power exercises	Fast	2-5 min between muscle groups

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CHAPTER 9

Total-Body Conditioning

Both muscular and cardiorespiratory conditioning are essential for health, fitness, and performance. Consequently, engaging in total-body conditioning can have a profound impact on overall quality of life. Activities such as walking, running, cycling, and swimming combined with resistance training, such as Suspension Training, develop the body as well as the mind and spirit. This chapter addresses the importance of including total-body conditioning in a training program to achieve long-term success and prevent injuries. Conditioning the entire body requires addressing many factors, such as muscular and cardiorespiratory health and fitness. However, for the purpose of this discussion, I define total-body conditioning as a method of developing overall muscular fitness using Suspension Training.

What Is Total-Body Conditioning?

Developing muscular fitness can be defined as improving several muscle qualities simultaneously—strength, endurance, power, and size. However, based on the intensities and volumes (sets x reps) used, total-body training tends to favor the development of muscular endurance and toning (slight increases in muscle size and reductions in body fat). Depending on the type of program, total-body conditioning is best used for developing general physical preparedness (GPP), maintaining health and fitness, preventing injury, and avoiding overtraining. These goals are addressed in the following sections.

Developing General Physical Preparedness (GPP)

When beginning a fitness program, a good base of overall fitness is important to set the stage for intense training and reduce the risk of injury. The exercises used at the beginning should be basic and aimed at improving fundamental movement mechanics before moving on to heavier, more advanced lifts. Body weight exercises that can be augmented with Suspension Training are ideal at this stage.

Advanced fitness enthusiasts and athletes often begin each macrocycle with a GPP phase. This helps transition into activity after an active rest period (e.g., following a sport season or a yearly training cycle). During this phase, the emphasis is on increasing training volume and accumulating more physical stress to improve general fitness and setting the stage for higher-load, lower-volume training focused on strength and power (see chapter 11).

Maintaining Health and Fitness

Because total-body conditioning improves general muscular fitness, it also helps not only to develop but also to maintain a general level of health and fitness. Although not maximized, strength and power can be improved using a total-body conditioning program while maintaining a good level of muscular endurance and improving muscle size. Improving cardiorespiratory fitness with total-body circuit training can result in both physical and mental health improvements.

Preventing Injury and Avoiding Overtraining

As mentioned, total-body conditioning programs typically involve exercises that can be performed relatively easily with one's own body weight or light external loading. Suspension Training is excellent for making subtle and progressive resistance changes during the initial stages of learning, and for improving the efficiency of certain movement patterns prior to increasing resistance for that movement (e.g., learning how to perform a body weight squat prior to performing a barbell back squat).

Also, total-body conditioning using Suspension Training is an ideal way to unload the stress on the body from several weeks of increasing intensities during a periodized training program. Reducing this stress allows physiological adaptations to take place.

Incorporating Suspension Training Into a Total-Body Conditioning Program

Suspension Training can be used as a stand-alone training modality or as part of a more traditional training program that uses barbells, dumbbells, and machines to improve muscular fitness. In either case, it is a fun and unique method that can make training feel less monotonous, thus increasing motivation and enthusiasm for training sessions or workouts.

Using Suspension Training along with an existing program provides variety to muscles. Although the resistance and load for some exercises seem low compared to traditional resistance or weight training, they can be enough to develop

muscle strength. For this reason, it is important to be aware of the contribution of Suspension Training to the overall training volume to avoid overtraining.

Suspension Training is also a great way to warm up the muscles and tendons prior to heavier resistance training. This prepares the muscles surrounding the joints and the core for the increased tension that comes with heavy lifting while also increasing proprioceptor activity at the joints. Performing a Suspension Training exercise as a warm-up to a similar exercise may result in greater force production during the heavier lift.

The use of Suspension Training with an existing training program provides diversity and a greater number of exercises to select from and incorporate into a training program. The challenges that Suspension Training provides also help avoid the plateaus encountered in most traditional programs.

Sample Total-Body Conditioning Programs

The following are sample total-body training circuits. They can be used as stand-alone workouts or as finishers for those at higher fitness levels.

Suspension-Only Total-Body Conditioning Program

INSTRUCTIONS

Perform 8 to 12 repetitions for each of the following exercise. Each exercise should be performed in sequential order before returning to the first exercise. Repeat each exercise as many times as possible for 10 minutes; then, rest for 3 minutes. Perform 1 to 3 rounds.

EXERCISES

1. Chest press (pg. 37)
2. Inverted row (pg. 63)
3. Reverse lunge with knee drive, right (pg. 90)
4. Reverse lunge with knee drive, left (pg. 90)
5. I, Y, T (pg. 72)
6. Triangle squat (pg. 103)

Suspension and Body Weight Total-Body Conditioning Program

INSTRUCTIONS

Perform 8 to 12 repetitions for each of the following exercises. Each exercise should be performed in sequential order before returning to the first exercise. Repeat each exercise as many times as possible for 10 minutes; then, rest for 3 minutes. Perform 1 to 3 rounds.

EXERCISES

1. Deep squat (pg. 91)
2. Squat jump (pg. 115)
3. Chest fly (pg. 45)
4. Lateral squat (pg. 95)
5. Low row (pg. 70)
6. Reverse lunge (pg. 107)

Suspension and Dumbbell or Kettlebell Total-Body Conditioning Program

INSTRUCTIONS

Select a weight you can lift for 20 reps when performing the dumbbell or kettlebell exercises. Perform 6 reps of each exercise for three rounds. Then, rest for 3 minutes.

EXERCISES

1. Romanian deadlift (dumbbell or kettlebell)
2. Pike (pg. 158)
3. Low row (pg. 70)
4. High pull (dumbbell or kettlebell)
5. Bicycle crunch (pg. 149)
6. Overhead press (dumbbell or kettlebell)

Suspension Warrior Total-Body Conditioning Program

This circuit uses a combination of supersets and compound sets to improve muscular fitness and endurance. The amount of work completed is determined by fitness level and the ability to maintain good form and technique throughout the circuit. If unable to maintain good technique and form, slow down or take brief bouts of rest between repetitions or exercises to keep moving for the allotted time.

INSTRUCTIONS

Perform 2 rounds with a 3 to 5-minute rest between them, for a total of 15 minutes. This circuit may be repeated 2 to 3 times in a single training session.

EXERCISES

1. Chest press (pg. 37): 30 seconds
2. Inverted row (pg. 63): 30 seconds
3. Lateral squat, right (pg. 95): 30 seconds
4. Lateral squat, left (pg. 95): 30 seconds
5. Chest fly (pg. 45): 30 seconds
6. Overhead squat (pg. 94): 30 seconds, alternating left and right
7. Rear deltoid row (pg. 64): 30 seconds
8. Lying leg curl (pg. 102): 30 seconds
9. Biceps curl (pg. 65): 30 seconds
10. Standing overhead triceps extension (pg. 38): 30 seconds
11. Standing lateral twist (pg. 152): 30 seconds
12. Suspended reverse lunge, right (pg. 101): 30 seconds
13. Suspended reverse lunge, left (pg. 101): 30 seconds
14. Rotational side plank, right (pg. 146): 30 seconds
15. Rotational side plank, left (pg. 146): 30 seconds
16. Bicycle crunch (pg. 149): 60 seconds

General Total-Body Conditioning Program

This general physical preparedness program was designed for athletes, but it can also be used for those looking to develop general fitness. This program shows how Suspension Training can be used with a more traditional training program to develop a base of fitness for more intense training in subsequent stages (see figure 9.1).

FIGURE 9.1 General Total-Body Conditioning Program

Day 1	Page	Week 1	2	3	4
1a. Back squat		3 x 10	3 x 10	3 x 8	2 x 8
1b. Single-arm dumbbell row (supported)		3 x 10	3 x 10	3 x 8	2 x 8
2a. Dumbbell incline bench press		3 x 10	3 x 10	3 x 8	2 x 8
2b. Dumbbell Romanian deadlift		3 x 10	3 x 10	3 x 8	2 x 8
2c. Sprinter plank	Pg. 144	3 x 10	3 x 10	3 x 12	2 x 10
3a. 90-degree low row		3 x 10	3 x 10	3 x 12	2 x 10
3b. Side plank	Pg. 145	2 x 20 sec	2 x 25 sec	2 x 30 sec	2 x 20 sec
3c. Lying leg curl	Pg. 102	3 x 10	3 x 10	3 x 12	2 x 10
Day 2	**Page**	**Week 1**	**2**	**3**	**4**
1a. Clean pull		3 x 6	3 x 6	3 x 6	2 x 6
1b. Push-up plus	Pg. 40	3 x 10	3 x 10	3 x 10	2 x 10
2a. Push press		3 x 6	3 x 6	3 x 6	2 x 6
2b. Deep squat	Pg. 91	3 x 6	3 x 6	3 x 6	2 x 6
3a. Reverse lunge	Pg. 107	3 x 8	3 x 8	3 x 8	2 x 8
3b. Single-leg reaching Romanian deadlift	Pg. 89	3 x 8	3 x 8	3 x 8	2 x 8

Core Strengthening Program

INSTRUCTIONS

Perform exercises 3 days per week for 6 weeks. Perform each exercise for 3 sets of 12 to 15 reps unless otherwise indicated. Rest 90 seconds between sets.

EXERCISES

Day 1

1. Deep squat (pg. 91)
2. Bicycle crunch (pg. 149)
3. Power pull (pg. 154)
4. Pike (pg. 158)
5. Extended-arm plank (pg. 143): 30 seconds

Day 2

1. Overhead squat (pg. 94)
2. I, Y, T (pg. 72)
3. Rotational crunch (pg. 150)
4. Rotational side plank (pg. 146)
5. Glute bridge (pg. 138)
6. Suspended push-up (pg. 43)

Day 3

1. Suspended reverse lunge (pg. 101)
2. Inverted row (pg. 63)
3. Push-up with reverse crunch (pg. 44)
4. Pike (pg. 158)

Trunk-Strengthening Program

INSTRUCTIONS

Perform each of the following routines on non-consecutive days for 6 weeks. Perform 10 to 15 repetitions of each exercise in sequential order without resting, or for the prescribed amount of time listed. Once you have performed each exercise, rest 90 to 120 seconds, then repeat.

EXERCISES

Day 1

1. Single-leg chest fly (pg. 55)
2. Standing Russian twist (pg. 153): 10 to 15 in each direction
3. Bicycle crunch (pg. 149)
4. Pike (pg. 158)
5. Elbow plank (pg. 140): 30 to 90 seconds

Day 2

1. Push-up with reverse crunch (pg. 44)
2. Extended arm plank 30 to 90 seconds (pg. 143)
3. Rotational side plank (pg. 146): 10 to 15 each side
4. Supine plank (pg. 141): 30 to 90 seconds
5. Single-leg lying leg curl (pg. 129): 10 to 15 each side

Day 3

1. Kneeling or standing rollout (pg. 151 or pg. 159)
2. Power pull (pg. 154): 10 to 15 reps each side
3. Pavlov press (pg. 147): 10 to 15 reps each side
4. Sprinter chest press (pg. 42): 10 to 15 reps each leg
5. Standing lateral twist (pg.152): 10 to 15 reps each side

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Prehabilitation

Prehabilitation is a proactive approach to avoiding injury. Athletes and physically active people should include some form of prehabilitation into their programs. Muscle imbalances and repetitive motion often lead to injury, and incorporating a few prehabilitation exercises into an existing program greatly reduces the risk. This chapter addresses some of the areas of the body most susceptible to injury, and thus most benefited by a proactive approach.

What Is Prehabilitation?

Prehabilitation is the process of using exercises to strengthen vulnerable areas of the body to avoid injury. Most trainers and therapists working with physically active people and athletes are aware of the value of prehabilitation, sometimes targeting areas that have been injured in the past.

A prehabilitation exercise program is most often used to address muscle imbalances that typically lead to future injury. It should not replace a rehabilitation program, which addresses an injury and should be directed by a rehabilitation expert such as a physical therapist or athletic trainer. Prehabilitation addresses commonly injured areas before they become injured.

Sample Suspension Training Prehabilitation Programs

This section outlines prehabilitation programs for specific joints and body regions. They should be used as part of more comprehensive training programs and not necessarily as stand-alone programs. These programs may benefit those engaged in sports and recreational activities with known injury risks. For instance, overhead throwing sports such as baseball, softball, and volleyball carry an increased risk of shoulder injury. It is well known that strengthening the rotator cuff muscles can reduce this risk. Similarly, in athletes involved in swinging sports such as tennis and golf, strengthening the muscles that surround the elbow joint may reduce the risk of strains in

this area. Although no prehabilitation program can guarantee that an injury will not occur, being proactive may reduce the risk and provide more time enjoying recreation and sports and less time on the sidelines.

Checking with a health care provider before attempting any of these exercises is important. Those with existing or previous injuries should consult a physical therapist or physician to learn of any contraindications or necessary modifications. Anyone who experiences pain during any of these exercises should seek the advice of a medical professional.

Shoulder Prehabilitation Program

Shoulder prehabilitation is useful for avoiding common overuse conditions such as tendinitis. The rotator cuff is especially vulnerable during activities that involve throwing or overhead lifting. Strong rotator cuff muscles as well as the other muscles around the shoulder are key to avoiding muscle injury in the shoulder.

INSTRUCTIONS

Perform 2 or 3 sets of 8 to 12 repetitions. Perform 2 or 3 days per week on non-consecutive days.

EXERCISES

1. Scapular retraction (pg. 62)
2. Push-up plus (pg. 40) (may be substituted with standing push-up plus)
3. Rear deltoid row (pg. 64)
4. Dual-arm external rotation (pg. 67)
5. Dual-arm internal rotation (pg. 76)
6. I, Y, T (pg. 72)

Elbow Prehabilitation Program

Elbow prehabilitation targets the structures surrounding the elbow joint. As with the shoulder, overuse is a major cause of elbow tendinitis. Elbow tendinitis is commonly referred to as golfer's elbow when it involves the medial aspect of the elbow and tennis elbow when it involves the lateral aspect of the elbow.

Elbow issues are often a result of overuse symptoms caused by poor technique. Strong extensor muscles in the forearm, as well as in the biceps and triceps, are key to avoiding elbow injury. Exercises that increase the time the muscle is under tension can be beneficial. Exercises must be performed with good technique and form so as not to contribute to elbow pain.

INSTRUCTIONS

Perform 2 or 3 sets of 8 to 12 repetitions. Perform 2 or 3 days per week on non-consecutive days.

EXERCISES

1. Biceps curl (pg. 65)
2. Kneeling overhead triceps extension (pg. 47)
3. Standing skull crusher (pg. 61)
4. Reverse biceps curl (pg. 75)
5. Wrist flexion (pg. 66)
6. Wrist extension (pg. 66)

Knee Prehabilitation Program

Knee prehabilitation is useful for addressing common overuse conditions such as patellar tendinitis, quadriceps tendinitis, and hamstring tendinitis. Having strong quadriceps is key in avoiding knee pain, as is flexibility in both knees and hips. Strong hamstrings are also necessary, but more important is maintaining a good hamstring-to-quadriceps strength ratio.

INSTRUCTIONS

Perform 2 or 3 sets of 8 to 12 repetitions. Perform 2 or 3 days per week on non-consecutive days.

EXERCISES

1. Deep squat (pg. 91)
2. Pistol squat (pg. 119)
3. Lying leg curl (pg. 102)
4. Bicycle crunch (pg. 149)
5. Glute bridge (pg. 138)

Low Back Prehabilitation Program

Low back prehabilitation is important in most physical activities. The causes of low back pain are many and varied; regardless of the cause, strengthening the muscles around the spine is often effective. Equally important is strengthening the muscles of the trunk such as the abdominals, as well as strengthening and improving movement patterns.

INSTRUCTIONS

Perform 2 or 3 sets of 8 to 12 repetitions. Perform 2 or 3 days per week on non-consecutive days.

EXERCISES

1. Elbow plank (pg. 140)
2. Reverse crunch (pg. 148)
3. Pike (pg. 158)
4. Rotational side plank (pg. 146)
5. Palov press (pg. 147)
6. Figure-four stretch (pg. 105)
7. Reaching hip flexor stretch (pg. 106)

Hip and Ankle Prehabilitation Program

The major areas of mobility restriction in the lower body are the hips and ankles. Limited dorsiflexion and hip mobility may lead to compensatory movement patterns in the lower extremities that may cause injury and poor biomechanical technique during activities of daily living and sports.

INSTRUCTIONS

Perform 2 or 3 sets of 8 to 12 repetitions. Perform 2 or 3 days per week on non-consecutive days.

EXERCISES

1. Excursions (pg. 88)
2. Deep squat (pg. 91)
3. Triangle squat (pg. 103)
4. Pigeon stretch (pg. 104)
5. Single-leg reaching Romanian deadlift (pg. 89)
6. Lateral lunge (pg. 97)
7. Reverse lunge with knee drive (pg. 90)
8. Leg sweep (pg. 99)

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CHAPTER 11

Strength and Power

Strength and power are two highly desirable attributes for athletes. In the sport world, the value of being able to exert high levels of force quickly is evident; however, this ability is also important for improving and maintaining quality of life throughout the life span. Possessing adequate strength and power improves not only the performance of recreational activities and activities of daily living, but also the ability to respond in emergency situations, all while reducing the risk of certain types of injury.

This chapter discusses how to improve strength and power through a combination of traditional training and Suspension Training. Using Suspension Training in combination with traditional training (e.g., velocity-based training) can improve structural integrity in the joints during high-velocity exercises.

What Are Strength and Power?

Strength and power, two muscle qualities essential to high-level performance and activities of daily living, are often lumped together. Although they are strongly linked, they are separate qualities, and they must be trained differently to maximize performance.

Strength can be defined as the ability to exert a maximal (or near maximal) force. The ability to exert this force does not depend on time. In fact, the more time we have to lift the load, the more muscle fibers we can recruit (a.k.a. summation of forces). For example, a powerlifter's main goal is to lift as much weight as possible in three main lifts—the bench press, squat, and deadlift. As the weight increases, the time required to move the weight increases. The amount of force required to lift the weight is very high, and it takes a long time for the muscles to exert near maximum force.

In contrast, power can be defined as the optimal combination of force and velocity to perform a task with skill and efficiency. For example, although similar to the back squat, the vertical jump is performed by generating enough

force at a high enough speed to overcome the pull of gravity (32.2 ft/ sec^2 or 9.81 m/sec^2). When not performed quickly, the vertical jump resembles a squat because not enough power is created to generate thrust, or liftoff. When not trying to move a heavy load, just one's own body weight, it is much easier to produce the needed force fast enough to leave the ground. This force–speed trade-off is commonly known as the force–velocity continuum. Essentially, as load increases, the force required to move that load increases and movement velocity decreases. The lighter the load is, the less force is required to move it and the ability to move the load quickly increases. This can be seen in the previous example of using a back squat in contrast to a vertical jump.

Developing strength and power requires a good base of muscular endurance and fitness to support and accommodate higher levels of stress on the musculoskeletal and neurological systems. This is why strength and power training are typically performed during the latter stages of a linear periodization program, after establishing a general fitness base. Strength and power training also require a good level of mobility, stability, and motor control to execute movements correctly. These factors help increase the ability to synergize the joints and joint structures in more biomechanically advantageous positions to generate force while reducing injury risk.

Because power is the optimal combination of force and speed to perform a task, strength is generally considered a precursor to power. In other words, lacking the appropriate level of strength to generate force during explosive movements reduces power potential. Therefore, those seeking to improve power must first dedicate an appropriate amount of time to enhancing strength. For example, in plyometric, or jump-based, training, force is required to jump as high as necessary; however, strength is still required to land in a good biomechanical position to absorb the force of the landing, or to transition to another movement in a sporting activity (e.g., a jump to a sprint).

Incorporating Suspension Training Into a Strength and Power Program

Suspension Training exercises can be used as a primary method of developing strength and power or as an ancillary method depending on strength level and goals. When the primary goal is to develop strength and power for recreational activities, Suspension Training works well as the primary training method. However, if the primary goal is to enhance sport performance, Suspension Training should be used to augment traditional training methods. The following are ways to do so.

Priming for Bigger Exercises

Suspension Training exercises can be used as priming, or neuromuscular activation, exercises to prepare for heavier lifts (e.g., performing a chest fly or chest press a few minutes prior to performing a bench press). Essentially, these exercises force the intrinsic muscles that stabilize the joint during movement to work harder, which takes the emphasis off the prime movers. When the lifter attempts the heavier lift with a barbell or dumbbell, the stabilizers are activated, which may improve inter- and intramuscular coordination when performing heavier lifts.

Improving Lagging Muscles and Muscle Groups

Some people find that smaller and weaker muscles or muscle groups limit their ability to lift heavier weights or break out of a training plateau. Working these smaller muscle groups may improve strength, thereby improving performance on the target exercise. For example, during a chin-up, the biceps are a secondary mover, whereas the latissimus dorsi is the prime mover. Strengthening the biceps may result in the ability to perform more chin-ups.

Improving Training Density

Improving training density means getting in more training in less time. This can be done by inserting Suspension Training exercises aimed at improving mobility, stability, and coordination between heavy lifts in a strength and power program.

Preventing Injury and Overtraining

Suspension Training exercises may challenge the stabilizer muscles to a larger extent than traditional resistance training exercises do. This can improve joint stability and motor control, which enhances coordination and movement economy. Additionally, many of the drop drills can be used to improve dynamic stability, increase joint position sense, and teach proper landing mechanics as a precursor to plyometric training. The ability to decrease the load while increasing the intensity makes Suspension Training a valuable asset to any training program.

Strength is typically developed using low volumes (i.e., sets × reps) and heavy weights. Generally, a training load that can be lifted only six or fewer times is prescribed to optimize strength gains. Thus, developing strength directly from Suspension Training requires the performance of exercises that allow only six or fewer repetitions. For beginners, such exercises may not be hard to find, but for experienced lifters, this becomes more challenging. Adding dumbbells, medicine balls, kettlebells, and weighted vests can increase the load and continue to challenge strength levels. Performing single-leg Suspension Training exercises is another way to increase the workload to enhance strength.

Power exercises often use similar repetition ranges to strength exercises. This is because they are highly neurologically demanding (i.e., performing more than 10 repetitions often leads to significant power reductions as fatigue ensues). Also, as fatigue increases, the risk of injury increases exponentially. Some Suspension Training power exercises are more general and may be great progressions or regressions for those looking for sport-specific plyometric variations.

Developing a Strength Program Using Suspension Training

A sufficient load, or training weight, must be used to optimize strength gains. For some people, especially beginners, body weight exercises provide the challenge necessary for improving strength. This does not mean that working in higher repetition ranges will not improve strength; it just will not optimize strength. To increase strength significantly, a person may need to add weight to some Suspension Training exercises—for example, wearing a weighted vest when doing performing an inverted or low row, holding a pair of dumbbells or kettlebells when performing a reverse lunge, or manipulating body position and angle to increase resistance. Manipulating Suspension Training exercises

to keep them in a range of one to eight repetitions before volitional fatigue can result in significant strength improvements.

For the strongest of the strong, such as powerlifters and weightlifters, time under tension (TUT) training in conjunction with more traditional forms of training may be a more appropriate use of Suspension Training, rather than using it as a method of optimizing strength. By increasing the amount of time a muscle is under tension, the amount of time the muscle is under isometric stress is increased. This forces the lifter to use good form and technique, as well as increases the stabilization and metabolic demands of an exercise. For these reasons it is a great addition to training for those seeking to improve maximal strength. The following are explanations of how to implement this style of training.

Time Under Tension (TUT) Method

The Time Under Tension (TUT) method requires slow movements to increase the amount of time the muscle is under stress. This is accomplished by increasing the amount of time spent performing the concentric (lifting and shortening the muscle) portion of the exercise, holding the contraction (isometric muscle action) for a few seconds at the peak, and slowly lowering (eccentric muscle action) back to the starting position. This technique progressively overloads the muscle using volume rather than increased training load. For example, if it normally takes 10 seconds to perform 10 push-ups, using TUT it may take up to 60 seconds (2 seconds in the lowering phase, 2 seconds holding the body in the down position, and 2 seconds to return to the starting position).

TUT, which is popular for improving hypertrophy, is beneficial for increasing strength in the ligaments and connective tissues, as well as smaller stabilizer muscles. These improvements may lead to greater overall gains in strength and power. The following are a few examples of how to use the TUT method. These can be applied to any of the dynamic Suspension Training (non-isometric exercises) in this text:

- *2-second descent*: 1-second hold, 2-second ascent (2-1-2 × 10-12 reps)
- *3-second descent*: 1-second hold, 3-second ascent (3-1-3 × 8 reps)
- *5-second descent*: 1-second hold, 5-second ascent (5-1-5 × 6 reps)
- *2-second descent:* 2-second hold, 2-second ascent (2-2-2 × 10-12 reps)
- *3-second descent:* 3-second hold, 3-second ascent (3-3-3 × 8 reps)
- *5-second descent:* 5-second hold, 5-second ascent (5-5-5 × 6 reps)
- *2-second descent:* 5-second hold, 2-second ascent (2-2-2 × 10 reps).

These are just a few suggestions on how to manipulate the tempos when using the TUT method. Remember, as the time that your muscles are under stress increases, muscular fatigue will also increase. If you are unable to perform the exercises with good form and technique for all of the desired repetitions, you may perform a cluster set in order to maintain overall training volume and good form.

Using the TUT method with Suspension Training increases both complexity and intensity while maintaining the safety of a lesser load. These methods are also good for improving motor learning, joint position sense, and body awareness, which translates to a greater ability to stabilize and support heavier training loads.

Integrating Suspension Training Into a Training Program

The following are two sample dynamic warm-ups using TUT training. They were designed for use with a split training program (i.e., upper body one day and lower body on another day). The first should be used prior to a heavy upper-body lifting session, and the second should be used prior to a heavy lower-body lifting session. These warm-ups should be performed just before the weight training session in the sequence listed for one or two sets. The feet can be adjusted to increase or decrease intensity. Because this is a warm-up, it should be moderately challenging but not overly difficult to avoid becoming fatigued prior to performing the working sets.

Upper-Body TUT Method Warm-Up

1. *Standing push-up plus*—10 reps at a 3:0:1 tempo (3 seconds down and 1 second to return to the starting position).
2. *Prone iron cross*—Lower and hold 10 seconds; then return to the starting position (5 reps).
3. Split fly—10 reps at a 3: 1: 3 tempo (3 seconds down, hold 1 second, then 3 seconds to return to the starting position).
4. *Suspended push-up*—10 reps at a 3:3 tempo with an isometric hold (3 seconds down, hold for 3 seconds at the bottom of the movement, and then 3 seconds to return to the starting position).
5. *Rear deltoid row*—5 reps at a 3:0:3 tempo (3 seconds down and 3 seconds to return to the starting position).
6. *Field goal*—5 reps at a 3:0:3 tempo (3 seconds down and 3 seconds to return to a starting position).

Lower-Body TUT Method Warm-Up

1. *Glute bridge*—5 reps at a 3:0:1 tempo (3 seconds down and 1 second to return to the starting position).
2. *Lying leg curl*—5 reps at a 3:0:3 tempo (3 seconds down and 3 seconds to return to the starting position).
3. *Iso squat*—Lower and hold 5 seconds; then return to the starting position for 5 reps.
4. *Iso lateral squat*—Lower and hold 5 seconds; then return to the starting position for 8 reps on each side.
5. *Overhead squat*—5 reps at a 3:3:3 tempo (3 seconds down, hold for 3 seconds, then seconds to return to the starting position).

Developing a Power Program Using Suspension Training

Plyometric exercises are commonly used to improve power. The term *plyometric* literally means to increase distance or measure. These exercises rely heavily on the stretch–shortening cycle, proprioceptors, and stored elastic energy to produce power. The following are the three phases of a plyometric movement:

1. Rapid and eccentric loading or descending portion of the movement
2. Concentric action (force production or the propulsive phase of the movement)
3. Amortization phase (the time between the eccentric loading and concentric force production portion of these movements).

Fully benefiting from this form of training requires reducing the time spent in the amortization phase, so the body can take full advantage of stored elastic energy. However, maintaining good form and technique when first learning these drills, or as fatigue builds, can be difficult. Two major reasons for this are poor technique and a lack of strength to maintain a proper body position when absorbing the force created by body weight at landing. For this reason, we recommend performing several weeks to months of resistance training prior to adding power training to an exercise program to build enough strength to maintain good form and technique. We also recommend learning how to absorb force at landing prior to performing jumping movements. This will ensure good technique at landing and reduce the risk of injury as the power training program progresses.

Sample Suspension Training Strength and Power Programs

The following are three sample strength and power programs using Suspension Training, starting with a beginner program. Those who can perform more than eight repetitions for four consecutive sets of an exercise can progress to the next level. Someone who can perform more than 8 repetitions of the exercises in the advanced column can increase the intensity by adding resistance in the form of dumbbells or a weighted vest.

Following the strength programs are three sample power programs using plyometrics. These programs should be performed prior to lifting sessions because they are quite fatiguing. Fatigue decreases the ability to maintain good form and technique, reducing both safety and effectiveness. Each drill should be performed with the best technique possible to ensure proper movement mechanics. The program choice should be based on the level of experience with the exercises; however, it is good to start with the beginner program and advance only after mastering both the form and technique of each exercise.

Beginner Suspension Training Strength Program

INSTRUCTIONS

Perform this program two or three days per week with a minimum of 48 hours between training sessions. For each exercise, perform three or four sets of six to eight repetitions with 60 to 90 seconds of rest between sets.

EXERCISES

1. Reverse lunge (pg. 107)
2. Inverted row (pg. 64)
3. Chest press (pg. 37)
4. Rear deltoid row (pg. 64)
5. Biceps curl (pg. 65)
6. Kneeling skull crusher (pg. 46)
7. Calf raise (pg. 100)
8. Reverse crunch (pg. 148)
9. Lying leg curl (pg. 102)

Intermediate Suspension Training Strength Program

INSTRUCTIONS

Perform this program two or three days per week with a minimum of 48 hours between training sessions. For each exercise, perform three or four sets of six to eight repetitions with 60 to 90 seconds of rest between sets.

EXERCISES

1. Pistol squat (pg. 119)
2. Low row (pg. 70)
3. Chest fly (pg. 45)
4. T fly (pg. 74)
5. Reverse biceps curl (pg. 75)
6. Standing skull crusher (pg. 61)
7. Single-leg calf raise (pg. 108)
8. Kneeling rollout (pg. 151)
9. Single-leg lying leg curl (pg. 129)

Advanced Suspension Training Strength Program

INSTRUCTIONS

Perform two or three days per week with a minimum of 48 hours between training sessions. For each exercise, perform for three or four sets of six to eight repetitions with 60 to 90 seconds of rest between sets.

EXERCISES

1. Rear foot elevated split squat with dumbbells
2. Single-arm inverted row (pg. 77)
3. Incline push-up (pg. 51)
4. Single-arm biceps curl (pg. 79)
5. Standing overhead triceps extension (pg. 38)
6. Single-leg calf raise (pg. 108)
7. Pike (pg. 158)
8. Single-leg lying leg curl (pg. 129)

Beginner Suspension Training Power Program

INSTRUCTIONS

Perform two or three sets of 8 to 10 repetitions per exercise. All single-leg exercises should be completed with 8 to 10 repetitions on each leg.

EXERCISES

1. Iso squat (pg. 92)
2. Iso lateral squat (pg. 96)
3. Drop squat (pg. 113)
4. Drop split squat (pg. 114)
5. Drop push-up (pg. 54)

Intermediate Suspension Training Power Program

INSTRUCTIONS

Perform two or three sets of five or six repetitions per exercise. All single-leg exercises should be completed with 5 to 6 repetitions on each leg.

EXERCISES

1. Drop split squat (pg. 114)
2. Squat jump (pg. 115)
3. Split squat jump to stick (pg. 118)
4. Lateral skater with stick (pg. 117)
5. Countermovement jump to stick (pg. 116)
6. Alternated split squat jump to stick (pg. 135)
7. Explosive push-up (pg. 56)

Advanced Suspension Training Power Program

INSTRUCTIONS

Perform two sets of five or six repetitions per exercise. All single-leg exercises should be completed with 5 to 6 repetitions on each leg.

EXERCISES

1. Squat jump (pg. 115)
2. Repeat countermovement jump (pg. 132)
3. Repeat lateral skater (pg. 133)
4. Alternated repeat split squat jump (pg. 135)
5. Plyo push-up (pg. 58)

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CHAPTER 12

Speed and Agility

Speed is one of the most highly desirable attributes in sport. The need for speed is obvious in sprint events, such as in track and field. However, in field and court sports, speed is essential for creating space in relation to defenders when playing offensive positions. When playing defensive positons, speed is necessary for reducing space in relation to offensive players.

Suspension Training can improve speed by developing the underlying physical qualities that support speed development. Improving posture, mobility, and stability via Suspension Training can transfer directly to on-field performance, while also building injury resistance. This chapter addresses the speed attributes necessary for succeeding in sport, as well as how to use Suspension Training to develop specific muscles and abilities that can improve speed.

What Are Speed and Agility?

Although speed and agility have elements in common, they are different qualities. Improving them requires an understanding of their differences. Speed can be defined as the ability to cover a given distance in a certain amount of time. Generally, we think of speed as the ability to move between two points as fast as possible, especially in relation to sports like track and field. However, in most field- and court-based sports, these two points are rarely in a straight line for more than 5 to 10 yards or meters. For this reason, speed can be broken down into straight-line (linear) speed and change-of-direction speed (CODS). CODS is the ability to change direction with skill and efficiency without a visual, kinesthetic, or auditory stimulus signaling the need to do so. CODS is a critical aspect of agility as it represents a major physical attribute related to this skill. Agility combines CODS (a physical quality) and the ability to react and respond to a stimulus (a mental ability).

Physical Qualities That Contribute to Speed and Agility

From a physical standpoint, linear speed and agility depend on the ability to stabilize the trunk and specific joints to create, reduce, and transfer force during running and cutting movements. Mobility at other joints is also essential to promote proper reloading of the musculoskeletal system and to prepare the body to produce force at foot strike. Although the specifics of speed and agility technique are beyond the scope of this book, we present exercises for developing and preparing the musculature and joints to enhance speed technique.

Chu and Korchemny (1993) described two main phases associated with sprinting: the support phase and the flight phase. The support phase starts at foot strike and is where braking occurs. During this phase, the ankle, knee, and hip bend slightly to absorb the force of landing on one leg while the opposite leg ankle, knee and hip are flexed in preparation for the next foot strike. The flight phase is characterized by the rising and falling of the center of mass and the time during the sprint cycle in which the feet are not in contact with the ground. Figure 12.1 displays these phases.

Sample Suspension Training Speed and Agility Programs

Suspension Training can be used to improve three major areas of speed and agility: posture, arm action, and leg action. This section presents exercises for developing the muscles needed for making improvements in these areas.

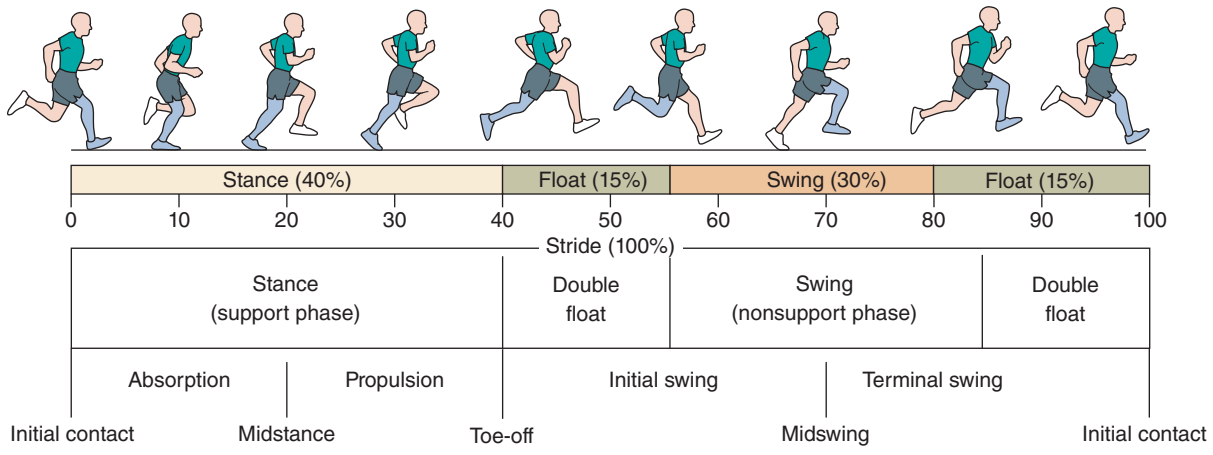

FIGURE 12.1 Phases of the foot strike.

Suspension Training Speed Posture Program

Proper posture is essential for proper sprinting mechanics and change-of-direction speed. Both the back extensors and the abdominal muscles, also known as the core, stabilize the pelvis while running. Therefore, a strong and stable core provides a solid platform, or base, for movement at the shoulder and hip joints. This platform is essential for maximizing stride length and stride frequency during sprinting and when accelerating. It is also essential for maintaining trunk integrity during agility movements, especially when an unexpected force is presented, such as getting hit by or colliding with an object or opponent. The following Suspension Training exercises can improve core stability and thus both speed and agility.

INSTRUCTIONS

Perform 2 or 3 rounds (one round is equivalent to performing one set of each exercise, preferably in order).

EXERCISES

1. Palov press (pg. 147): 5 times on each side at a 3:3 tempo
2. Side plank (pg. 145): 30 seconds on each side
3. Sprinter plank (pg. 144): 10 reps on each leg at a 1:3 tempo (drive the knee; then slowly return to the starting position)
4. Kneeling rollout (pg. 151): 10 reps
5. Reverse lunge with horizontal push (pg. 110): 10 reps

Suspension Training Arm Action Program

Arm speed governs leg speed: the faster the arms move and coordinate with lower-body actions, the greater the speed will be. Strength in the shoulders and arms is important for efficient arm action. The arms also help decelerate the body and maintain balance during all-out speed episodes and cutting movements. Therefore, strengthening the elbow extensors and flexors, in addition to increasing muscular endurance and joint stability, results in greater force generation and momentum during a hard cut or deceleration. Additionally, the muscles of the shoulders and back are essential for generating power and explosiveness for lower-body propulsion and leg turnover. The integrity of both the shoulder joint and the elbow joint is also important for remaining relaxed while running so that the postural muscles can stabilize the trunk and shoulders and thus maintain proper body positioning. The musculature also helps maintain speed endurance during longer track and field and endurance events, as well as during repeated sprints, by reducing fatigue during the latter stages of a competition.

A benefit of using Suspension Training is that when performing many traditional isolation exercises, (i.e., leg extension, leg curl) the core must work harder to stabilize the trunk. Many times, these exercises are performed with the trunk in contact with a pad, which acts to stabilize the spine and subsequently reduces the cores involvement in the exercise. Suspension Training shifts the emphasis form training muscle groups in isolation back to a total body integration to execute the exercise effectively. The following Suspension Training exercises can improve arm action while sprinting or changing directions, or both.

INSTRUCTIONS

Perform 2 or 3 rounds.

EXERCISES

1. Scapular retraction (pg. 62): 10 reps
2. Inverted row (pg. 63): 10 reps
3. Rear deltoid row (pg. 64): 10 reps
4. Supine iron cross (pg. 69): 5 reps
5. Sprinter chest press (pg. 42): 10 reps

Suspension Training Leg Action Programs

Speed is improved by increasing either stride length or stride frequency. Many drills develop these variables by improving balance, mobility, flexibility, power and strength, as addressed in chapter 10 and 12. This section uses a part-to-whole approach to look at muscles that may benefit from isolation work to improve stability and endurance while also enhancing power output for the larger-muscle-group exercises presented in chapter 10.

GLUTES

The gluteus maximus, gluteus medius, and gluteus minimus are critical for controlling motion at the hip joint and for hip extension during the propulsion phase of sprinting. They are also critical for preventing hip drop, which may lead to overuse injuries such as IT band syndrome, knee pain or injury, and low back issues. The following exercises can be used to target and strengthen the gluteal muscles and to develop controlled range of motion at the hip joint.

Instructions

Perform 2 or 3 rounds.

Exercises

1. Glute bridge (pg. 138): 30 to 60 seconds
2. Side plank (pg. 145): 30 seconds on each side
3. Deep squat (pg. 91): 10 reps
4. Reverse lunge with knee drive (pg. 90) or Sprinter lunge (pg. 98): 10 reps on each side
5. Lateral lunge (pg. 97): 10 reps on each side

HAMSTRINGS

The function of the hamstrings is to decelerate the leg during knee extension and to assist in knee flexion during running to position the leg for the next foot strike. Training the hamstrings is critical to reduce the risk of overuse injury and to prevent overstretching at the knee joint. Therefore, the hamstrings must be both strong and pliable to control high-speed stretching (eccentric muscle actions), yet strong enough to prevent knee hyperextension at ground contact. The following exercises develop hamstring strength and flexibility.

Instructions

Perform 2 or 3 rounds.

Exercises

1. Single-leg reaching Romanian deadlift (pg. 89): 10 reps on each side
2. Lying leg curl (pg. 102): 10 reps on each side
3. Single-leg lying leg curl (pg. 129): 5 reps on each side
4. Triangle squat (pg. 103): 10 reps
5. Figure-four stretch (pg. 105): 3 × 10-second hold on each side

(continued)

KNEE EXTENSORS

The quadriceps (the muscle at the front of the thigh) works as a knee extensor. Knee extension during running occurs when the leg straightens to prepare to make ground contact. The quadriceps consist of the rectus femoris, vastus medialis, vastus lateralis, and vastus intermedius of the upper portion of the thigh. The popliteus muscle helps stabilize the back of the knee during the extension and internal rotation of the tibia in relation to the femur to unlock it during knee extension. The plantaris muscle also assists with knee extension and ankle plantar flexion during running.

The biomechanics of running are complex: many muscle groups need to work in concert for efficient action. The following exercises can be used to isolate many of these muscle groups to strengthen them and reduce injury risk. The lower-body exercises in chapter 6 can be used to increase strength and power in these muscles.

Instructions

Perform 2 or 3 sets of exercise 1 and once you are able to perform 3 sets of this exercise for two workouts in a row, progress to exercise 2.

Exercises

1. Suspended knee extension (pg. 112): 10-12 reps
2. Single-leg suspended knee extension (pg. 130): 5 to 10 reps on each side

HIP FLEXION

Hip flexion is essential for generating power and forward propulsion during running. The iliopsoas, rectus femoris, tensor fasciae latae, pectineus, and gracilis muscles all contribute to hip flexion. Strong hip flexors are critical for loading the hip to generate force at foot strike. Hip mobility increases the amplitude of the hips' range of motion, which may assist in generating more force. The following exercises strengthen and stretch many of these muscle groups, while also developing the core.

Instructions

Perform 2 or 3 rounds.

Exercises

1. Push-up with reverse crunch (pg. 44): 10 reps
2. Bicycle crunch (pg. 149): 10 reps on each side
3. Reverse lunge with knee drive (pg. 90): 10 reps on each side
4. Pike (pg. 158): 10 reps

CALVES

The gastrocnemius and soleus muscles make up the calves. The gastrocnemius crosses both the knee and the ankle joint, whereas the soleus crosses only the ankle. The rapid eccentric loading of the gastrocnemius and soleus, combined with plantar flexion of the ankle, is responsible for the powerful push-off action that occurs at foot strike. Both are vital for locomotive movements such as walking and running.

Instructions
Perform 2 or 3 sets of exercise 1 and once you are able to perform 3 sets of this exercise for two workouts in a row, progress to exercise 2. Resistance can be added by adding weighted vests, or holding a dumbbell in one hand and using the suspension strap in the other hand to help maintain balance.

Exercises

1. Calf raise (pg. 100): 20 to 30 reps
2. Single-leg calf raise (pg. 108): 10 to 15 reps

FEET

The plantar surface (bottom) of the foot, in conjunction with the calf muscles, helps create a stable platform at foot strike. Strong plantar muscles are critical for stabilizing the foot joints during ground contact because of the extensive mobility of the foot. The following exercises target these muscle groups. It is recommended to perform these exercise barefoot when possible to reduce the stability created from athletic footwear and improves proprioceptive awareness.

Instructions
Perform 2 or 3 rounds.

Exercises

1. Single-leg reaching Romanian deadlift (pg. 89): 10 reps on each side
2. Leg sweep (pg. 99): 10 reps on each side

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CHAPTER 13

Balance, Stability, and Flexibility

Movement is a complex process that requires harmonious interactions of the neural, muscular, and skeletal systems to produce, reduce, and resist forces. Unfortunately, muscle imbalances, poor posture, improper technique, previous injury, and repetitive physical stress can keep these systems from functioning properly.

Balance, stability, and flexibility are critical to athletic performance, good health, injury prevention, and most daily activities. Moreover, the natural aging process tends to result in a reduction in both balance and flexibility, which may impede function and the ability to live independently. For these reasons, it is extremely important to attain acceptable levels of these qualities and to maintain them throughout the life span. This chapter addresses factors that influence balance, stability, and flexibility, and explains how to develop them using Suspension Training.

What Are Balance, Stability, and Flexibility?

This section discusses the major differences between balance, stability, and flexibility. It also explains how they interact to foster efficient movement and neuromuscular activity.

Balance

Balance can be defined as the ability to maintain equilibrium. In terms of movement, balance is generally thought of as trying to maintain one's center of mass within the base of support. As weight shifts, numerous subtle adjustments are needed to remain in a balanced state and keep from falling. Although this seems to be a relatively simple concept, the ability to maintain balance, especially during activity, is a very complex process. The central nervous system must process information received from the balance mechanisms in the inner ear, the eyes, and the receptors in the joints and muscles (proprioceptors). It then sends this information back to the musculoskeletal system to create both static (in place) and dynamic (with movement) equilibrium.

Improving balance requires performing activities that challenge balance. Including Suspension Training exercises in a comprehensive training program is an excellent way to add progressive amounts of instability in a safe, controlled environment while also enhancing proprioception.

Stability

Stability, or motor control, is the ability to resist unwanted movements. Stabilizing joints and joint structures during movement is necessary for producing and reducing force, as well as for resisting unwanted forces on the body during sudden or unanticipated movements. For instance, during sprinting or jumping, it is important to stabilize the trunk to transfer the forces created from the ground up through the body to move either horizontally or vertically. An inability to stabilize the torso creates energy leaks within the body that result in unwanted and inefficient movements that may interfere with performance and increase the risk of injury.

One of the major benefits of using Suspension Training within a training program is that most Suspension Training exercises require and develop trunk stability. For example, a biceps curl or triceps extension exercise performed on a Suspension Trainer becomes a dynamic trunk stability workout as well as a way to work on aesthetic goals such as improving the tone or size of the upper arms. This is especially useful for those who want to develop the bicep and triceps, which is a goal often considered irrelevant to sport functioning. Incorporating these exercises into a workout can increase enthusiasm for training by meeting both aesthetic and training goals.

Flexibility

Flexibility is the ability to move freely throughout a wide range of purposeful movements without restriction. Some refer to it as the available range of motion around a joint. Technically, this describes mobility, because it relates to joint function rather than tissue (muscle) extensibility. Flexibility can be thought of as the muscles' range of motion, whereas mobility can be thought of as the joints' range of motion. However, the two are intimately related. Poor flexibility in the muscles that surround a joint can certainly impede joint range of motion, or mobility. Flexibility is affected by variables such as age, gender, joint structure, activity level, and heredity. Of these, the only modifiable factor is activity level. Performing exercises through joints' full safe ranges of motion can improve both flexibility and mobility.

Similar to balance, flexibility can be classified as both static and dynamic. Static flexibility exercises are best for improving long-term flexibility, whereas dynamic flexibility exercises improve short-term flexibility. Therefore, using dynamic flexibility exercises prior to a workout session is a great way to prepare the body for more vigorous activity. In contrast, static flexibility exercise is best used postworkout to reduce muscle imbalances and improve body symmetry.

Sample Balance, Stability, and Flexibility Programs

The following programs improve balance, stability, and flexibility. Depending on current fitness levels, they may be used as stand-alone workouts, as active recovery programs between more intense training sessions, or as part of a dynamic warm-up prior to traditional resistance training.

Suspension Training Balance Program

Holding the straps of the Suspension Trainer is an excellent beginning balance training exercise because it provides additional, yet slightly unstable, support. Performing floor exercises unilaterally or on an unstable surface (e.g., foam pad) can further challenge the proprioceptors. Although most exercises for balance involve the lower body, some upper-body floor exercises, such as planks, can also be used.

The progression of Suspension Training balance exercises should be from a two-point base to a one-point base. Next, a pillow or foam pad can be used to increase the instability of a one-point base.

The following are exercises that develop both static and dynamic balance. They are best performed as part of an integrated dynamic warm-up, as part of a superset during a traditional weight training session, or instead of a complete rest between sets. Using them in place of rests increases the density of a session by providing more work in the same time frame without detracting from the primary focus of training.

INSTRUCTIONS

Perform 2 or 3 rounds of the following circuit. If performing this as a stand-alone workout, use the higher end of the repetition range. If used as an active recovery or as part of a dynamic warm-up, perform the lower end of the repetition range.

EXERCISES

1. Reaching hip flexor stretch (pg. 106): 5 to 10 reps on each side
2. Single-leg reaching Romanian deadlift (pg. 89): 5 to 10 reps on each side
3. Leg sweep (pg. 99): 5 to 10 reps on each side
4. Single-leg chest press (pg. 39): 5 to 10 reps on each side
5. Single-leg chest fly (pg. 55): 5 to 10 reps on each side
6. Reverse lunge with chop and lift (pg. 109): 5 to 10 reps on each side
7. Reverse lunge with overhead press (pg. 124): 5 to 10 reps on each side
8. Reverse lunge with single-arm overhead press (pg. 125): 5 to 10 reps on each side
9. Overhead squat (pg. 94): 5 to 10 reps on each side
10. Drop squat (pg. 113): 5 reps
11. Drop split squat (pg. 114): 5 reps

Suspension Training Core Stability Program

Core strength stability is essential for optimal performance. The core provides a stable base of support that facilitates fluid and precise arm and leg movements. The following program emphasizes core stability and control. It can be used as a dynamic warm-up prior to a traditional resistance training session or as a stand-alone workout.

INSTRUCTIONS

Perform the exercises in order for 1 to 3 rounds with no more than 1 minute of rest between rounds.

EXERCISES

1. Glute bridge (pg. 138): 20 reps; hold at the top for two counts, then slowly lower the hips until they are approximately 3-6 inches off the ground, then return to the bridge position.
2. Rotational side plank (pg. 146): 10 reps on each side
3. Bicycle crunch (pg. 149): 20 reps
4. Pike (pg. 158): 10 reps
5. Extended-arm plank (pg. 143): 10 to 30 seconds on each side

Suspension Training Flexibility Programs

Suspension Training can be used to improve both static and dynamic flexibility. Performing purposeful dynamic movements at a low intensity improves the dynamic flexibility of muscles, tendons, and surrounding connective tissue. Using Suspension Training statically provides the advantage of gravity or resistance to increase range of motion. The following dynamic and static flexibility workouts can be used as part of a Suspension Training session before (dynamic) and after (static) a traditional strength training session to improve flexibility.

The exercises in these workouts progress in difficulty primarily through the angle of attack or the angle in relation to the anchor point. As in resistance training, an increased angle increases the difficulty of the stretch. Some exercises appear as both dynamic and static flexibility exercises; the main difference between these types of exercises is the amount of time spent holding the stretch (no more than a few seconds in dynamic versions, and longer in static versions).

DYNAMIC FLEXIBILITY PROGRAM

This workout should be performed as part of a warm-up prior to an exercise session. These exercises prepare the musculoskeletal system for more vigorous activity.

Instructions

Perform 10 to 20 reps per exercise. Hold the stretched position for 1 to 3 seconds before performing the next repetition.

Exercises

1. Deep squat (pg. 91)
2. Triangle squat (pg. 103)
3. Reaching hip flexor stretch (pg. 106)
4. Reverse lunge with knee drive (pg. 90)
5. Push-up plus (pg. 40)
6. Overhead squat (pg. 94)

STATIC FLEXIBILITY PROGRAM

This program should be performed at the end of a training session to improve flexibility.

Instructions

Choose at least 1 exercise for each body region. Hold the stretched position for 10 to 30 seconds. Perform 1 to 3 sets for each exercise for a duration of 30 to 60 seconds. The following is a sample static stretching program. These exercises can be replaced with more advanced exercises as the user progresses.

Exercises

1. Pec stretch (pg. 81)
2. Overhead lat stretch (pg. 84)
3. Rear deltoid stretch (pg. 85)
4. Deep squat (pg. 91)
5. Iso lateral squat (pg. 96)
6. Overhead squat (pg. 94)
7. Pigeon stretch (pg. 104)
8. Figure four stretch (pg. 105)

Balance, Stability, and Flexibility Suspension Program

The following is a dynamic warm-up routine that combines balance, stability, and flexibility.

INSTRUCTIONS

Perform 2 or 3 rounds of the following exercises.

EXERCISES

1. Glute bridge (pg. 138): 20 reps
2. Elbow plank (pg. 140): 20 seconds
3. Side plank (pg. 145): 20 seconds on each side
4. Reverse crunch (pg. 148): 10 reps
5. Push-up plus (pg. 40): 10 reps
6. Overhead squat (pg. 94): 10 reps
7. Lateral squat (pg. 95): 10 reps on each side
8. Reverse lunge with knee drive (pg. 90): 10 reps on each side
9. Excursions (pg. 88): 5 reps on each side
10. Drop squat (pg. 113): 5 reps
11. Leg sweep (pg. 99): 10 reps on each side

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Photo courtesy of Jay Dawes.

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