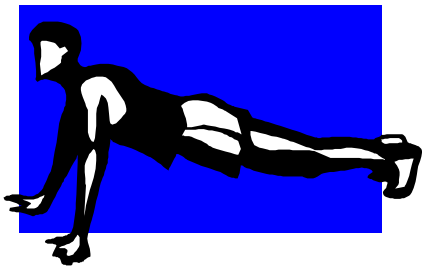
Train to Win

Functional Training & Core Stabilization

Functional Exercise Training Programs That Train Movements, Not Just Muscles



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Introduction

The information in this booklet contains a continuum of basic to advanced fitness training concepts that can and should be integrated into any exercise program.

Muscle training has been proven to be a valuable asset in improving the strength, power, endurance, girth and symmetry of muscle groups. It is a fundamental element in sports conditioning and training. It is also a primary tool in the prevention of musculoskeletal injuries, particularly repetitive stress injuries. It is the hallmark of rehabilitation programs. Muscle training can play an important role in improving posture and balance. It has become an essential ingredient of weight control programs. And in older adults, muscle strength helps determine how functional their life can be based upon their ability to do everyday tasks easily.

With muscles playing such an important role in our lives, we should make training them a higher priority. But we should understand that one type of exercise routine couldn't possibly train muscles to adequately fulfill these different roles and functions.

Consider the types of muscular exercises you have done in the past. Even if you haven't done muscular exercise, you still have a picture in your mind of what muscle training is all about. Historically, muscle training involved using your own body weight against gravity to create resistance to overload the muscle. Examples are doing situps, pushups or chinning yourself on a bar. Additional resistance was added through the use of weights, such as dumbbells or barbells. Then the industry changed markedly with the emergence of universal-type weight machines. They have been shown to be safer for the untrained and unsupervised exerciser but rarely simulate the movement patterns we perform in every day life.

Now, muscle training is changing again by incorporating strength training that more closely simulates the types of movement patterns and strength requirements we have in our everyday lives. Exercising your biceps on a weight machine with very heavy weights does not necessarily translate to the type of strength required when lifting your toddler off the ground while twisting around another sibling. Strengthening your lower back muscles in a single plane on a weight machine is quite different from the many tasks we do in our work places or around our homes. Most of the times we injure our muscles are not caused by significant trauma, but by complex movements that require a combination of muscle groups working in unison. Yet, we typically only train individual muscles in very specific muscle patterns.

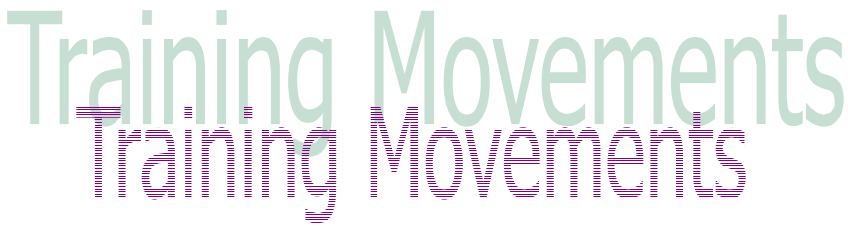
This booklet will introduce you to ***two new training concepts*** that should be considered both the foundation and cornerstone of all muscular training programs – ***Functional Training and Core Stabilization.***

Section 1

Functional Training

A New Trend in Strength Training

There has been a growing interest in recent years in a not-so-new concept in resistance training termed ***Functional Training*** (FT). Functional training is a method of strength training that stimulates improvement in the bodies' functional ability relating to specific movement patterns in sports or activities of daily living. For many years, coaches and athletes have been utilizing this sport-specific type of training to improve performance.



Physical therapists and athletic trainers have relied on FT to encourage a quick recovery from injury and to insure activity readiness and work hardening. It has not been until relatively recently that similar FT techniques have been incorporated into the everyday exercisers' program because of its many inherent benefits. These benefits include an increased physical capacity to do and sustain physical work as well as the ability to perform more challenging activities with less risk of injury. FT systematically progresses resistance training to the point where even awkward positions of lifting, balancing, turning and twisting can all be handled with greater stability, less effort and less fatigue.

The FT focus moves away from traditional body building type exercises where the concentration is on overload (strength) training of one muscle group at a time. There the major emphasis is on increasing the muscle strength, size and/or definition. In FT, similar overloading is required but the focus is put on motion and movement patterns rather then just the strength of a particular muscle group. Traditional strength training programs have relied heavily on machines that stabilize the weight for the user while the exercisers themselves perform the exercise in a two-dimensional movement pattern that rarely imitates typical activity patterns. With FT, the exerciser will be required to control and balance the weight while lifting and lowering it. Exercises using dumbbells and barbells (i.e., free weights) from a standing position are typically used in FT because the weights have to be controlled by the user and this encourages greater ability to support challenging weights while stabilizing the entire body from the ground up. This increases the functional effectiveness of training that can transfer into greater abilities to perform more demanding activities with potentially less strain to vulnerable joints like the low back and knees.

Functional training takes free weight training to another dimension by incorporating specific movement patterns mimic “real life” or a sport-specific setting. For example; standing, walking, turning, rotating, squatting, lunging, reaching, pushing, pulling, jumping and many more “free flowing” activities require movements in three planes of motion; 1) front ⇆ back, 2) side ⇆ side and 3) top ⇆ bottom. In FT, the exercises are geared to fulfill those multiple plane movement requirements while including the impact of gravitational forces that are part of real-life activities. Ultimately, the FT program can enhance your ability to perform everyday activities and more challenging exercises more efficiently with more power and less risk of injury. For the components of a typical FT program see below.

Functional training programs should include:

1. Multi-joint exercises. Examples: Squats & Lunges. Both of these exercises can be progressed to incorporate movements that are multi-dimensional. Once the exerciser has learned how to complete these multi-joint exercises appropriately in the back to front planes, then side to side and diagonal patterns can be included. Eventually, the exerciser can incorporate upper body exercises with the lower body movements.

2. Exercises should work in loading and unloading cycles. For example: catching and tossing a medicine ball requires the exerciser to pre-load the movements necessary to efficiently catch (deceleration) and then toss (unload) forcefully the heavy ball.

3. Include activities that require balance and stabilization. Examples: balancing on one foot, using balancing boards or discs, or sitting on a physioball while maintaining good posture and a stable spine. These can become progressively more challenging by closing the eyes or incorporating a light weight or medicine ball and moving it away from the body to change the center of gravity.

These and other FT exercises should not be attempted if you have a significant injury history until you: 1) have been cleared by your physician to participate in resistance training and 2) have established a sufficient level of core stability (see Section 2 – Core Stabilization).

With the increased interest in functional training, there has been an associated interest in “Core Conditioning.” This is where exercisers learn how to stabilize their body, especially the torso area, in order to safely and effectively perform more demanding FT exercises and other everyday activities. In a sense, core conditioning is the structural backbone of the body from which all exercise patterns emanate. If your core conditioning is inadequate, you are more prone to fatigue, dysfunction and injury.

Section 2

Core Stabilization

What is the "Core"?

Core stability includes the "combined attributes of strength, balance, agility and flexibility of the muscles that control the trunk and spine." A core conditioning program includes performing exercises that promote awareness and the activation of muscles required to stabilize the spine prior to both common and challenging movements. Successful *functional training* is dependent upon the stability of the core. Although the core is often associated with abdominal exercise, it is in fact much more comprehensive than your typical abdominal crunch or sit-up routine.

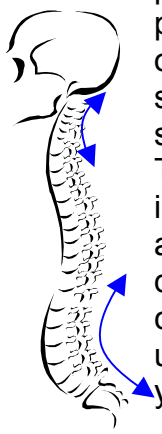
Not just abs anymore

Not just abs anymore

Conditioning the core requires a thoughtful progression of small steps to promote learning how to recruit the appropriate muscles to do the job of stabilization. There are basically three main steps to preparing your core for optimal stabilization:

1. Create and Maintain a Neutral Posture (NP)

The 1st step in core stabilization is to emphasis optimal posture in your exercise. This requires establishing a neutral posture or neutral spine. The neutral posture is a position of the spine that allows for the most efficient and stable position for moving in all three planes of motion as described in Section 1 (FT). Neutral posture is "a position where the joints are in proper biomechanical relationship to each other." Specifically, with NP there is a slight forward curvature in the lumbar spine (low back), a slight backward curvature of the mid back (thoracic spine), and a slight extension (forward curve) of the neck (cervical spine). The ears, shoulders, ribs, hips, knees and ankles should all be aligned when in the NP position. Additionally, in order to maintain this position, all associated muscles should activate appropriately both automatically and on demand. For many of us, this activation of the key core muscles has been compromised due to long periods of disuse or poor posture that has gone unchecked for many years. See Section 3 for a description on how to find your neutral posture.



2. Activate the Core

Once the neutral spine is identified, the next step is to learn how to activate some of the critical related core muscle groups. Key areas to activate include:

a. **The Lower Unit:** the lower unit includes the muscles of the pelvic floor and the transverse abdominis (TA) muscle. The TA is the lower abdominal muscle that is often forgotten about when relying only on crunches and sit-ups. However, it is one of the most critical muscles needed in the stabilization of the spine. See exercises to activate the TA in Section 3.

b. **The Posterior Stabilizers:** the posterior stabilizers include the muscles of the back, gluteals, hamstrings and adductors. Proper recruitment of these muscles will also increase core stability. See exercises to activate the posterior stabilizers in Section 3.

3. Integrating the Core – Putting It All Together

Once you have learned to properly engage the inner unit and other core stabilizers, you can add challenge to the core by moving limbs while in different activity modes or by eventually adding resistance and other functional training equipment like physioballs and other core challenging equipment. See samples of advanced core exercise in Section 3.

In the following section, a series of exercise progressions will be introduced with examples and Core Stabilization and Functional Training programs.

Section 3

The Exercises

Core Stabilization and Functional Training Exercises

These programs are designed as circuits and can be incorporated into your existing strength training routine or can be added as stand-alone routines to prevent against injury or prepare you for more strenuous fitness pursuits. The dumbbell routines are examples of full body function and strength training to encourage your functional strength development as well as increase or maintain lean body mass.

Activate & Integrate
Activate & Integrate

1. Finding Your Neutral Spine

Perform this exercise regularly for about 2-3 weeks before beginning your exercise routine. This exercise should be done while standing and can start from the feet upward or from the head downward. The purpose of this exercise is to learn to identify proper neutral posture using postural extremes as a reference point.

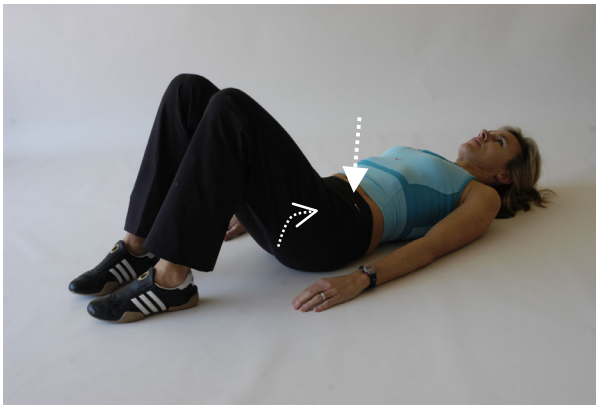
1. Begin with your feet hip-width apart.
2. Bend your knees to a semi-squat position and then come to a full stance with soft knees.
3. Rotate the pelvis between a posterior tilt, which creates a flat low back, and an anterior tilt, which creates excessive curvature in the low back. Then set the pelvis and low back in between those two extremes.
4. Contract the transverse abdominis (TA) and pelvic floor, thereby activating the inner unit. (See how to activate the TA in next set of exercises).
5. Lift and lower both shoulders, then relax them downward, depressing the shoulder blades. Roll the shoulder back.
6. Separate the shoulder blades (protract) and then retract the shoulder blade together. End with the shoulder blades slightly toward each other (retracted).
7. Extend the neck forward, then retract the chin (the ears should line up over your shoulders).
8. Check your neutral – review if your ears, shoulders, ribs, knees and ankles are all in alignment.

2. Core Stabilization Exercises

Core Activation Exercises – Floor

Lower Unit

Lie on the floor or mat on your back (supine) with your knees bent 90 degrees and your feet flat on the ground. Place one hand on your midsection a couple inches above your navel toward your chest and then cough. Then try to suppress a second cough by drawing the navel toward the spine using the transverse abdominis muscle (TA). Holding that contraction, activate the pelvic floor muscles by visualizing pulling the center bottom of your pelvis toward the head. Breath normally while keeping the gluteal muscles (buttock) relaxed, then release. Repeat this several times before your workout begins for the 1st couple of weeks until you feel confident that you are activating all the muscles of the inner unit.



Posterior Core

Lie on your back (supine) with knees bent and feet together. Place a towel between the knees and squeeze. Contract the inner unit and the gluteal muscles (buttocks). Lift the hips toward the ceiling, maintaining the squeeze on the towel. Keep the lifted part of the body in a straight line from the knees to the hips to the shoulders. Lower and repeat the exercise 5-10 times. Hold for 5 seconds at the top.

Increase Challenge

1. Increase the challenge to the lower unit by performing a progression of dead bug exercises. Lie on your back with knees bent. Activate your lower unit and the buttocks to hold spine stable and neutral throughout the exercise. Relax your neck and shoulders as you lift your arms and feet off the floor. If you can stabilize your spine (no pain or fatigue in the low back) then progress to slowly move your arms and legs alternating each side up and down without allowing movement in the spine.

2. Increase Challenge to posterior stabilizers.

1.



2.



Abdominal Crunches – Floor & Ball

Abdominal Crunches

Lift your head, neck and shoulders as one unit in a controlled motion. Lead with the ribs, up and forward in two counts until your shoulder blades clear the floor. Exhale as you complete the last count up. Do not lift any higher than this or you will be using your hip flexors instead of your abdominals, which could cause low back pain. Come back down slowly without relaxing the abdominals. Start with 5 repetitions and gradually build up to 20.

Crunches on Physioball

1. Once you have mastered sitting on the ball and maintaining a neutral spine with no discomfort you can proceed to crunches on the ball. Start by sitting on the ball and then slowly walk your hips down so that you are in about a 45 degree angle leaning back on the ball with your head up. Crunches are performed by slowing lowering your shoulders and head back and slightly around the ball and then returning to a crunched position. Keep your feet underneath your knees and your chin out of your chest. Do not let your neck move too far back or down the ball. Stop the exercise if you have any discomfort in the neck or low back. Increase the challenge by moving your arms from a crossed position in front of your chest up toward your head or above it. The farther your move your hands out over your head the more demanding this exercise becomes.
2. Add challenge by adding resistance like a medicine ball or dumbell.

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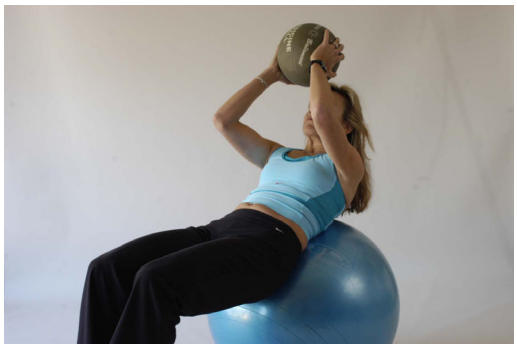


Hip & Back Extensors – Floor

Hip Extension

1. Starting on hands and knees, slowly raise one leg to a horizontal position and hold for 5 seconds. Keep your head in-line with the spine (don't look up or forward). Gradually lower the leg and then lift the opposite leg.

Hip & Back Extensors

2. Starting on hands and knees, slowly raise one arm and the opposite leg to a horizontal position and hold for 6 seconds. Gradually lower the arm and leg and then lift the other arm and opposite leg.
3. Same as above except you will lift arm and leg on same side to increase challenge.

1. 
2. 
3. 

The Core Brace Position – Floor

Prone Bridge

1. Start by pulling in your lower unit and other abdominals and lift your torso up from the elbows with hands turned inward. Lift from the knees or the toes depending on your ability to maintain a neutral spine (no fatigue or pain in the back) while holding.

Side Bridge

2. Start by lying on your side with the knee bent at about a 90-degree angle. With the abdominals pulled in, push up with the elbow, lifting the upper torso off the ground.
3. Increase the challenge in exercises 3-6.

1. 
2. 
3. 
4. 
5. 
6. 

Challenge Neutral Posture – Standing & Ball Work

One Foot & Balance Board Standing

1. Stand on one foot and try to maintain your neutral posture as described in the Section 2 introduction.
2. Stand on two feet or eventually one foot in the middle of a balance board maintaining your neutral posture.
3. Challenge can be increased by closing your eyes or moving light weights (medicine balls) out in front and to the side of the body. Be careful to maintain a neutral spine at all time keeping the strain on the core muscles rather than the low back area.

1. 

2. 

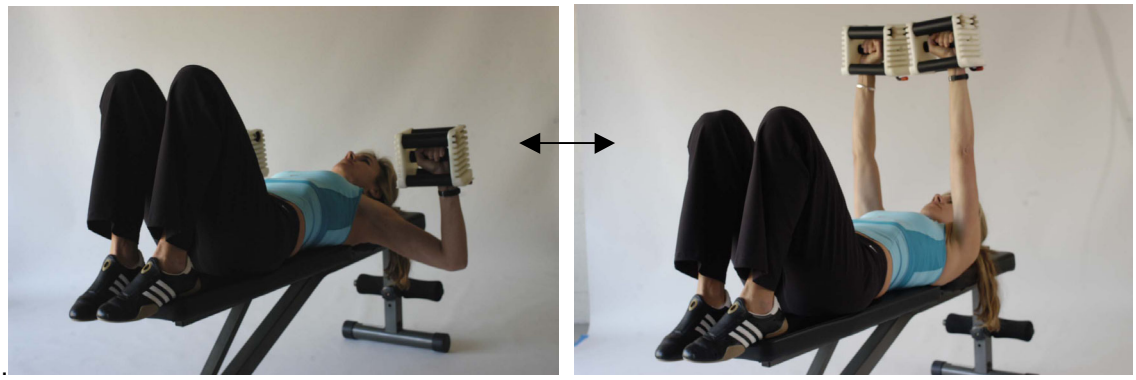
3. 

3. Functional Training Exercise

Chest Press – Bench, Floor or Physioball

Chest Press

1. Lie supine on a bench with your knees bent and your shoulder blades and head in contact with the bench, floor or physioball. Adjust your arms so that your elbows are positioned at about shoulder height. Press your arms out in front of you until your elbows are almost straight. Pause and slowly bring your arms back to the starting position. Exhale on the push and inhale when lowering the weight. Start with light weights until you are comfortable stabilizing the weights. It is always a good idea to have a trainer spot you when you are a beginner at this exercise.
2. Increase core challenge by training one arm at a time or alternating back and forth between arms.

1. 

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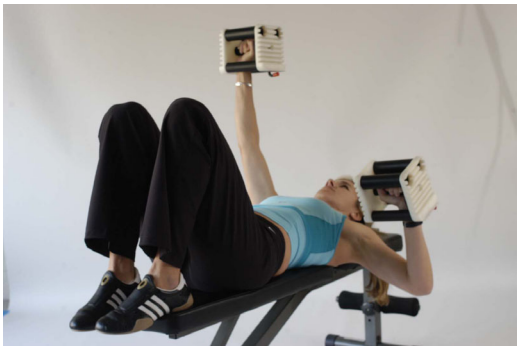
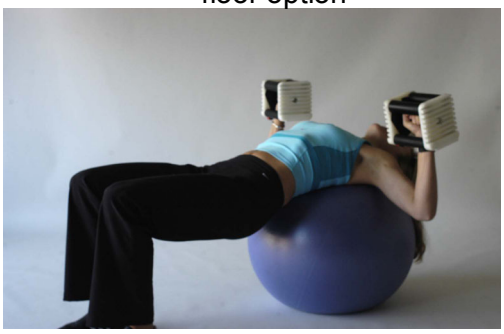
floor option



alternate



physioball

Push-Ups

1. Assume the push-up position on the floor as shown below. Straighten arms to push away your trunk (push-up). Hold for two seconds and slowly lower torso back to the ground. Do not allow your hips to drop or your back to arch (keep core activated). Exhale as you push up. Keep your elbows close to your body as you push up and down.
2. Increase whole body challenge by changing positions as shown below.

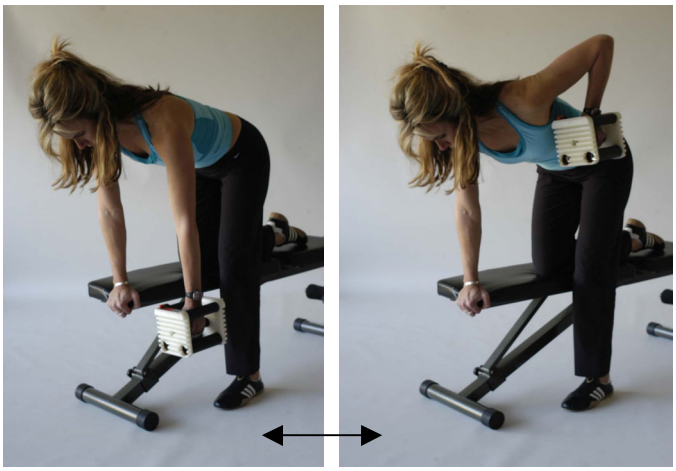
1.  

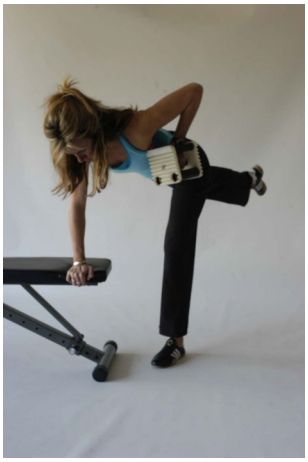
2. 

Upper Back (Rows and Pulls) – Bench, Physioball, Bar

Bent Over Row

1. Position yourself with the right knee and the same side arm on a bench or chair for back support. The left foot should be on the ground with that knee slightly bent, keeping the hips square and the upper body parallel with the floor. Start with the left arm holding the dumbbell in a fully extended position. Pull the weight up by bending the left arm and pulling it up so that the upper arm is parallel with the floor and the elbow forms a right angle.
2. Increase core challenge by extending one leg (opposite lifting arm) straight back. Keep you core activated and a neutral spine.

1. 

2. 

Pull-Ups

3. Use both forward and reverse grips. Start from the hanging position with arms fully extended. Be sure to pull in your abdominals and keep you knees slightly bent in front of you. Pull up until your hands are level with your shoulders, pause and slowly return to the starting position. Exhale on the pull and inhale when returning. Don't arch your back.

3.  

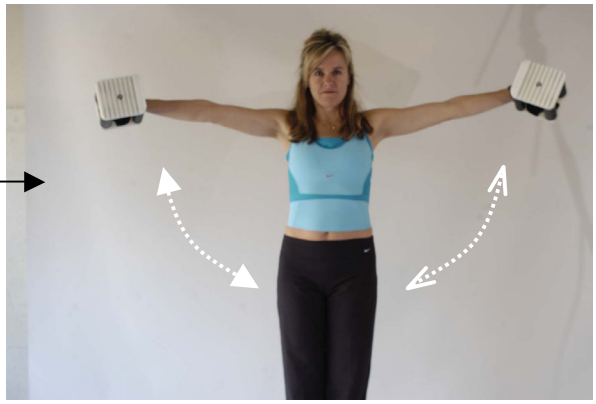
assisted non-assisted

Shoulders – Standing

Shoulder Raises

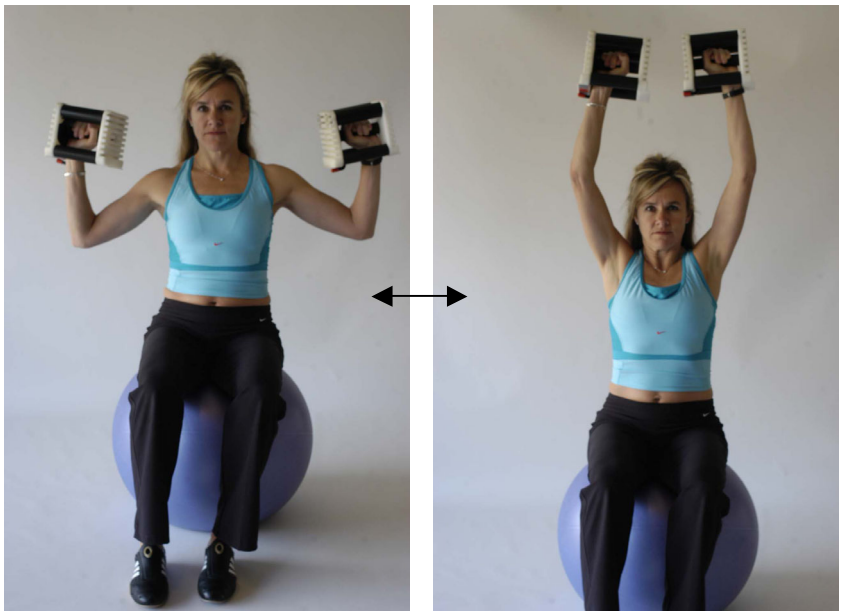
1. **Anterior Raises:** While standing with feet hip width apart, hold light weight dumbbells in both hands. Begin with palms toward your side and lift the weights straight out in front to a shoulder height level keeping arms straight throughout the movement. Pause and slowly return to the starting position. Fatigue should be felt in muscles of the shoulder and not in the upper back or neck areas. Avoid any discomfort at the joints.

2. **Lateral Raises:** While standing with feet hip width apart, hold light weight dumbbells in both hands. Begin with palms toward your side and lift the weights with straight arms outward up to shoulder height, pause and slowly return to the starting position. Fatigue should be felt in muscles of the shoulder and not in the upper back or neck areas. Avoid any discomfort at the joints.

1.  2. 

Shoulder Press

3. Sit with your feet flat on the floor and your upper body in neutral position. Hold the dumbbells at about the shoulder height. Push the weight toward the ceiling. When your elbows are almost extended, pause and slowly return to the starting position. Exhale on the push and inhale when returning the weight. Focus on holding your core throughout this exercise.
4. Increase the core challenge by training one arm at a time or alternating back and forth between arms. You can also combine a lower body exercise to the shoulder press exercise.

3. 

4. 

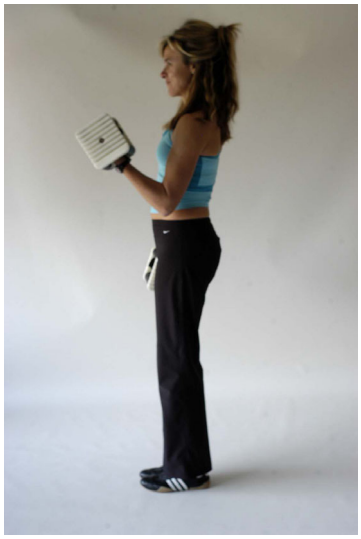
combining

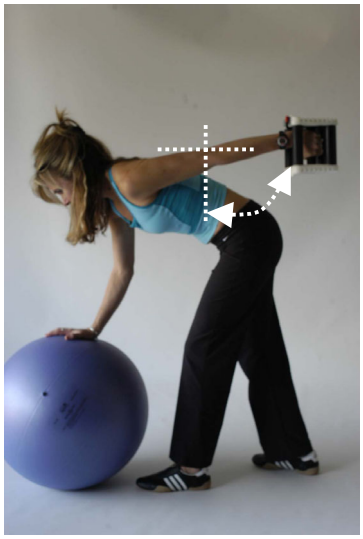
Emphasis on Arms – Standing

Biceps Curls

Triceps Extensions

1. From a standing or seated position, hold your set of dumbbells to your side with arms extended. Maintain a neutral spine by holding the abdominal muscles throughout the exercise. Curl up the weight with an underhand grip toward your shoulders. With the dumbbell motion you should rotate the palms from facing the sides at the start to the palms facing the chest at the end of contraction.
2. Position yourself with the left knee and the same side arm on a bench or chair for back support. The right foot should be on the ground with that knee slightly bent, keeping the hips square and the upper body parallel with the floor. Start with the right arm holding the elbow level with your torso. Lift the weight up by extending the right arm and pushing the weight back keeping the upper arm parallel with the floor. Squeeze the triceps, pause and slowly lower the weight back to the starting position. Complete your repetitions and then switch sides.
3. Increase the core challenge by using your body weight in dip motions or perform curls while standing on one foot or a balance disc.

1. 

2. 

3. 

combining

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1 foot

Lower Body – Standing, Physioball

Step-ups

1. Place a sturdy box, bench, or step about 4-10 inches high in front of mirror and stand facing the step or to the side of the step. Keeping your hips and shoulders square, slowly step up on the bench as though you're going up stairs but in slow motion. Then step back down. Keep a neutral posture. Start with no weight and slowly progress with added resistance from dumbbells. Holding the weight while stepping requires a strong focus on core – so don't forget to activate.

Step-Downs

2. Stand on top of the bench. Keep the foot of your non-dominant leg on the bench, with the toes slightly turned out (5-10 degrees). Keeping your hips and shoulders squared forward, and arms on hips or in front of you for counterbalance, slowly step forward off the bench as though you're going down stairs but in slow motion. Then step back up. Repeat w/out letting your knee turn in.

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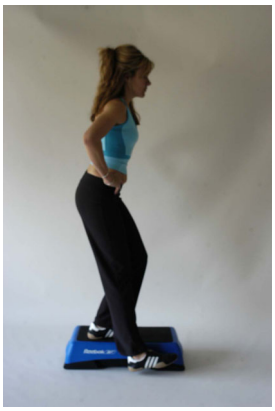
2. 

Squats

3. **Using Physioball**: Stand facing away from a wall. Place an exercise ball against the wall at the low-back height. Plant your feet 12–18 inches in front of your body with a shoulder-width stance, toes pointing forward. Lean into the ball as you lower your body until your knees are flexed at a 90 degree angle, pause and return to starting position. As you squat, the ball will move to your mid-and upper-back region. Your weight should be on your heels, not your toes, and your knees should not be past your toes.
4. Begin with feet shoulder width apart with feet pointing straight ahead and knees over 2nd & 3rd toes. If using resistance, hold dumbbells at chest level with palms facing body. Perform a ¼ or ½ squat keeping lower extremity in proper alignment. Before any compensation (i.e., bad form) occurs, activate gluteals and stand to a fully upright position.

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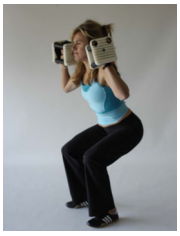
4. 

Lunges

5. Begin in a standing position and hold your core with spine neutral throughout the exercise. Step forward on one leg and slowly lower yourself by bending your knees until your back knee is 6-12 inches from the floor. Slowly return to a standing position. Pause and then repeat alternating sides or repeat same side when you have progressed in your conditioning. When bending the knees do not let the front knee travel beyond or in front of the same leg's ankle.
6. Increase core challenge by adding resistance or combining upper body exercises.

5. 

6.